ARTICLE 1

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ADMINISTRATION AND ENFORCEMENT

SECTION 100.0 SCOPE

100.1 TITLE: These regulations shall be known as the Commonwealth of Massachusetts State Building Code hereinafter referred to as the Basic Code. In accordance with C. 802, of the Acts of 1972 as amended, these regulations shall control; a) the construction, reconstruction, alteration, repair, demolition, removal, inspection, issuance and revocation of permits or licenses, installation of equipment, classification and definition of any building or structure and use or occupancy of all buildings and structures and parts thereof or classes of buildings and structures and parts thereof; b) the rehabilitation and maintenance of existing buildings; c) the standards or requirements for materials to be used in connection therewith, including but not limited to provisions for safety, ingress and egress, energy conservation and sanitary conditions; d) the establishment of reasonable fees for the issuance of licenses and permits in connection therewith; except as such matters are otherwise provided for in the Massachusetts General Laws Annotated, or in the rules and regulations authorized for promulgation under the provisions of the Basic Code.

100.2 APPLICATION OF REFERENCES: Unless otherwise specifically provided in the Basic Code, all references to article or section numbers, or to provisions not specifically identified by number, shall be construed to refer to such article, section or provision of the Basic Code.

100.3 CODE REMEDIAL: The Basic Code shall be construed to secure its expressed intent which is to insure public safety, health and welfare insofar as they are affected by building construction, through structural strength, adequate egress facilities, sanitary conditions, equipment, light and ventilation and fire safety; and in general, to secure safety to life and property and community from all hazards incident to the design, erection, repair, removal, demolition or use and occupancy of buildings, structures, or premises. The intent of the Basic Code is also to effect the establishment of uniform standards and requirements for construction and construction materials, compatible with accepted standards of engineering and fire prevention practices and public safety; the adoption of modern technical methods, devices and improvements which may reduce the cost of construction without affecting the health, safety, and security of the occupants or users of buildings; the elimination of restrictive, obsolete, conflicting and unnecessary building regulations and requirements which may increase the cost of construction and maintenance over the life of the building, or

retard unnecessarily the use of new materials, or which may provide unwarranted preferential treatment of types of classes of materials, products or methods of construction without affecting the health, safety, and security of the occupants or users of buildings.

100.4 SPECIALIZED CODES: Specialized codes, rules or regulations pertaining to building construction, reconstruction, alteration, repair, or demolition promulgated, and as amended from time to time, by the various authorized state agencies shall be incorporated in the Basic Code. The said specialized codes, rules or regulations include, but are not limited to, those listed in appendix K.

100.5 TECHNICAL CODE COUNCIL: The Technical Code Council is comprised of representatives from each of the state agencies having jurisdiction over the specialized codes including those cited in section 100.4, and listed in appendix K, and serves as an advisory board to the State Building Code Commission, herein referred to as the Commission, on matters related to uniformity of rules and regulations governing building construction and the establishment of uniform procedures relative to their administration and enforcement. Members of the Technical Code Council are listed in appendix L.

SECTION 101.0 MATTERS COVERED

The provisions of the Basic Code shall apply to all buildings and structures and their appurtenant constructions, including vaults, area and street projections and accessory additions; and shall apply with equal force to municipal, county, state, authorities established by the legislature and private buildings and structures; except where such buildings and structures are otherwise specifically provided for by statute.

101.1 EXEMPTIONS: No building or structure shall be constructed, extended, repaired, removed, demolished, or altered in violation of these provisions, except for ordinary repairs as defined in section 102.

101.2 MATTERS NOT COVERED.

101.21 PROPOSED BUILDINGS: Any requirement essential for structural strength, adequate egress facilities, sanitary conditions, equipment, light and ventilation, and fire safety of a proposed building or structure at the plan review stage and which is not specifically covered by the Basic Code, shall be determined by the State Building Code Commission.

101.22 EXISTING BUILDINGS AND BUILDINGS UNDER CONSTRUCTION: The building official shall determine any requirement which is not specifically covered by the Basic Code and which is essential for

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structural strength, adequate egress facilities, sanitary conditions, equipment, light and ventilation, and fire safety of existing buildings and structures or buildings and structures under construction. The Commission and the Department of Public Safety shall be notified in writing within seven (7) working days of any action taken under this section.

101.3 ZONING RESTRICTIONS: When the provisions herein specified for structural strength, adequate egress facilities, sanitary conditions, equipment, light and ventilation, and fire safety conflict with the local zoning by-laws or ordinances, the Basic Code shall control the erection or alteration of buildings in respect to location, use, permissible area and height.

SECTION 102.0 ORDINARY REPAIRS

Ordinary repairs to buildings and structures may be made without application or notice to the building official; but such repairs shall not include the cutting away of any wall, partition or portion thereof, the removal of cutting of any structural beam or bearing support, or the removal or change of any required means of egress, or rearrangement of parts of a structure affecting the exitway requirements; nor shall ordinary repairs include addition to, alteration of, replacement or relocation of any standpipe, water supply, sewer, drainage, drain leader, gas, soil, waste, vent or similar piping, electric wiring or mechanical or other work affecting public health or general safety.

SECTION 103.0 INSTALLATION OF SERVICE EQUIPMENT

When the installation, extension, alteration or repair of an elevator, moving stairway, mechanical equipment, refrigeration, air conditioning or ventilating apparatus, plumbing, gas piping, electric wiring, heating system or any other equipment is specifically controlled by the provisions of the Basic Code or the approved rules, it shall be unlawful to use such equipment until a certificate of approval has been issued therefor by the building official or other municipal or state agency having jurisdiction.

SECTION 104.0 MAINTENANCE

All buildings and structures and all parts thereof shall be maintained in a safe and sanitary condition. All service equipment, means of egress, devices and safeguards which are required by the Basic Code in a building or strucure shall be maintained in good working order. Any requirement necessary for the safety of the occupants thereof, not specifically covered by the Basic Code shall be determined by the building official.

104.1 OWNER RESPONSIBILITY: The owner, as defined in article 2, or his designated agent shall be responsible for the safe and sanitary maintenance of the building or structure and its exitway facilities at all times, unless otherwise specifically provided in the Basic Code.

SECTION 105.0 CHANGE IN EXISTING USE

105.1 CONTINUATION OF EXISTING USE: The legal use and occupancy of any structure existing on January 1, 1975, or for which it had been heretofore approved, may be continued without change, except as may be specifically covered in the Basic Code or as may be deemed necessary by the building official for the general safety and welfare of the occupants and the public.

105.2 CHANGE IN USE AND OCCUPANCY: It shall be unlawful to make any change in the use or occupancy of any structure or parts thereof without the building official having issued a certificate of use and occupancy indicating that such structure complies with the provisions of the Basic Code for the proposed new use or occupancy and that such change does not result in any greater hazard to public safety or welfare.

105.3 PART CHANGE IN USE: If a portion of the building is changed in occupancy or to a new use group and that portion is separated from the remainder of the building with the required vertical and horizontal fire division complying with the fire grading in table 9-1, then the construction involved in the change shall be made to conform to the requirements of the Basic Code for the new use and occupancy and the existing portion shall be made to comply with the exitway requirements of the Basic Code.

105.4 REESTABLISHMENT OF A PRIOR USE: After an approved change of use has been made to a building or parts thereof, the reestablishment of a prior use that is not legal to a new building or parts thereof of the same type of construction, is prohibited unless all the applicable provisions of the Basic Code have been met.

SECTION 106.0 ALTERATIONS & REPAIRS

Except as provided in this section, existing buildings or structures when altered or repaired as herein specified shall be made to conform to the full requirements of the Basic Code for new buildings:

106.1 ALTERATIONS EXCEEDING FIFTY PERCENT: If alterations or repairs are made within any period of twelve (12) months, costing in excess of fifty (50) percent of the physical value of the building; or

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106.2 DAMAGES EXCEEDING FIFTY PERCENT: If the building is damaged by fire or any other cause to an extent in excess of fifty (50) percent of the physical value of the building before the damage was incurred.

106.3 ALTERATION UNDER FIFTY PERCENT: If the cost of alterations or repairs described herein is between twenty-five (25) and fifty (50) percent of the physical value of the building, the building official shall determine to what degree the portions so altered or repaired shall be made to conform to the requirements for new buildings:

106.4 ALTERATION UNDER TWENTY-FIVE PERCENT: If the cost of alterations or repairs described herein is twenty-five (25) percent or less of the physical value of the building, the building official shall permit the restoration of the building to its condition previous to damage or deterioration with the same kind of materials as those of which the building was constructed; provided that such construction does not endanger the general safety and public welfare and complies with the provisions of article 9 in respect to existing roofs.

SEE 460.11

106.5 PHYSICAL VALUE: In applying the provisions of this section, the physical value of the building shall be based on the assessed value as recorded in the assessor's office of the municipality.

SECTION 107.0 BUILDING DEPARTMENT

107.1 BUILDING COMMISSIONER OR INSPECTOR OF BUILDINGS: The building department shall have an administrative chief responsible for the administration and enforcement of the Basic Code who shall be known as the building commissioner or inspector of buildings.

107.11 LOCAL INSPECTOR: The local inspector shall assist the building commissioner or inspector of buildings in the performance of his duties and shall also be responsible for the enforcement of the Basic Code.

107.12 ALTERNATE INSPECTOR: An alternate inspector of buildings may be appointed to act in the disability of the inspector of buildings in case of illness, absence, or conflict of interest. The alternate inspector shall meet the qualifications of section 107.4.

107.2 APPOINTMENT: The chief administrative officer of each city or town shall employ and designate an inspector of buildings or building commissioner, as well as such other local inspectors as are reasonably necessary. The inspector of buildings or building commissioner shall report directly and be solely responsible to the appointing authority.

107.3 OTHER PERSONNEL: The building commissioner or inspector of buildings may appoint such other personnel as shall be necessary for the administration of the Basic Code and as authorized by the appointing authority.

107.4 QUALIFICATIONS OF THE BUILDING COMMISSIONER OR INSPECTOR OF BUILDINGS: Each building commissioner or inspector of buildings shall have had at least five (5) years of experience in the supervicion of building construction or design or in the alternative a four-year undergraduate degree in a field related to building construction or design. In addition, such persons shall have had general knowledge of the accepted requirements for building construction, fire prevention, light, ventilation and safe exits; and a general knowledge of other equipment and material essential for safety, comfort, and convenience of the occupants of the building or structure; plus whatever requirements of experience and knowledge that are deemed necessary by the municipality.

107.5 QUALIFICATIONS OF THE LOCAL INSPECTOR: Each local inspector shall have had at least five (5) years of experience in the supervision of building construction or design or in the alternative a two-year associate degree in a field related to building construction or design. In addition, such persons shall have a general knowledge of the quality and strength of building materials; a general knowledge of the accepted requirements for building construction; fire prevention, light, ventilation and safe exits; and materials essential for safety, comfort, and convenience of the occupants of a building or structure; plus whatever requirements of experience and knowledge that are deemed necessary by the municipality.

107.6 CERTIFICATION: The Department of Community Affairs shall offer a certification program for building officials and shall issue a certificate to those who satisfactorily complete said program.

107.6 TRAINING: The Department of Community Affairs shall offer a continuing educational program designed to assist all building officials and state inspectors in executing their responsibilities as defined herein. Regular attendance at these programs shall be required of all building officials and state inspectors and no building official or state inspector who attends such course of instruction shall lose any reights relative to compensation or vacation time.

107.8 RESTRICTION ON EMPLOYLOYEES: No full-time building commissioner, inspector of buildings, or full-time local inspector as defined herein shall be engaged in, or directly or indirectly connected with, the furnishing of labor, materials or appliances for the construction, alteration or maintenance of a building or structure, or the preparation of plans or of

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specifications therefor, unless he is the owner of the building or structure; nor shall any officer or employee associated with the building department engage in any work which conflicts with his official duties or with the interests of the department.

SECTION 108.0 DUTIES AND POWERS OF THE BUILDING OFFICIAL AND THE STATE INSPECTOR

108.1 THE BUILDING OFFICIAL: The building commissioner or inspector of buildings and the local inspector shall enforce all the provisions of the Basic Code and any other applicable state statutes, rules and regulations, or ordinances and by-laws, and act on any question relative to the mode or manner of construction, and the materials to be used in the construction, reconstruction, alteration, repair, demolition, removal, installation of equipment, and the location use, occupancy, and maintenance of all buildings and structures, including any building or structure owned by any authority, except as may otherwise be specifically provided for by statutory requirements or as herein provided.

108.11 APPLICATIONS AND PERMITS: The building official shall receive applications and issue permits for the construction, reconstruction, alteration, repair, demolition, removal, and installation of equipment, and inspect the premises for which such permits have been issued and enforce compliance with the Basic Code provisions.

108.12 BUILDING NOTICES AND ORDERS: The building official shall issue all necessary notices or orders to remove illegal or unsafe conditions, to require the necessary safeguards during construction, to require adequate exitway facilities in new and existing buildings and structures, and to insure compliance with all the code requirements for the safety, health and general welfare of the public.

108.13 NEW MATERIALS AND METHODS OF CONSTRUCTION: The building official shall accept duly authenticated reports from the Commission on all new materials and methods of construction proposed for use which are not specifically provided for in the Basic Code. Wherever there is insufficient evidence that any material or method of construction conforms to the requirements of the Basic Code or there is insufficient evidence to substantiate claims for alternative materials or construction, the building official may require tests meeting the functional requirements of the Basic Code, and such tests shall be conducted by a laboratory and/or personnel approved by the Commission. The costs of all such tests or other investigations required under these provisions shall be paid by the applicant.

108.131 TEST RESULTS: Copies of the results of all such tests shall be forwarded to the Commission within ten (10) days and shall be kept on file in the permanent records of the building department.

108.132 RETESTING: The Commission may require tests to be repeated, if at any time there is reason to believe that material or construction no longer conforms to the requirements on which its approval was based.

108.14 INSPECTIONS: The building official shall make all the required inspections, or he may accept reports of inspections from a qualified registered professional engineer or architect or others certified by the Commission, and all reports of such inspections shall be in writing; or the building official may engage such expert as he may deem necessary to report upon unusual technical issues that may arise.

108.15 INSPECTION AND CERTIFICATION - SPECIFIED USE GROUPS: The building official shall inspect and certify buildings and structures in use groups F, H, L-1, and L-2, according to Table 1-1. No certificate of use and occupancy as herein specified shall be issued until there shall have been paid to the building department a fee as specified in section 118.0. A copy of said certificate shall be kept posted as specified in section 121.2.

108.16 ADMINISTRATIVE PROCEDURES: The building commissioner or inspector of buildings shall have the authority to formulate administrative procedures necessary to uniformly administer and enforce the Basic Code, provided that such procedures do not conflict with the rules and regulations promulgated by the Commission in the Basic Code or pursuant thereto.

108.17 DEPARTMENT RECORDS: The building official shall keep in a public place and open to public inspection during normal working hours official records of applications received, permits and certificates issued, fees collected, reports of inspections, variances granted, and notices and orders issued. File copies of all papers in connection with building operations shall be retained in the official records so long as the building or structure to which they relate remains in existence.

108.18 REPORTS: The building official shall submit the following reports:

a) to the Department of Community Affairs on a form provided by said Department a report of the building permit activity for the month;

b) to the chief administrative officer of the municipality a written statement of all permits and certificates issued, fees collected, inspections made, and notices and orders issued for the year;

TABLE 1-1 -- REQUIRED MINIMUM INSPECTIONS AND CERTIFICATION FOR SPECIFIED USE GROUPS
(See ARTICLE 2 for complete descriptions of use groups.)

USE GROUP			INSPECTIONS	CERTIFICATION
F-1-A	Assembly Theatres (seating capacity over 400)	With stage and scenery	Monthly	Annually
F-1-B		Without stage Movie Theatre	Semi-Annually	Annually
F-2	Assembly -- Night clubs and similar uses (seating capacity over 400)		Semi-Annually	Annually
F-3	Assembly -- Lecture halls, recreation centers, terminals, etc. (seating capacity over 400)		Semi-Annually	Annually
F-1-A	Assembly Theatres (seating capacity 400 or less)	With stage and scenery	Periodically	Annually
F-1-B		Without stage Movie Theatre	Periodically	Annually
H-1	Institutional -- Restrained		"	Every two years
H-2	Institutional -- Incapacitated		"	Every two years
F-2	Assembly -- Night clubs and similar uses (seating capacity 400 or less)		"	Annually
F-3	Assembly--Lecture halls, recreation centers, terminals, etc. (seating capacity 400 or less)		"	Annually
F-4	Assembly--Churches, schools		"	Up to five years
F-5	Assembly--Grandstands, bleachers, etc.		"	Every two years
F-6	Assembly--Schools: 10 or more students		"	Every two years
F-7	Assembly--F-2 and F-3 use groups seating between 20 and 50 persons		"	Annually
L-1	Residential--Hotels		"	Annually
L-2	Residential--Multi-family		"	Up to five years

c) to the Commission and Department of Public Safety reports on decisions regarding the matters not covered as specified in section 101.22; and

d) to the assessors of the municipality reports on permits issued as specified in section 114.11.

108.2 THE STATE INSPECTOR: In every city and town the Basic Code shall be enforced by the state inspector as to any structures or buildings or parts thereof that are owned by the Commonwealth or any departments, commissions, agencies, or authorities of the Commonwealth. The state inspector shall have as to such buildings and structures all the powers of a building commissioner or inspector of buildings.

108.21 OTHER RESPONSIBILITIES: The state inspector may review any order or decision of the building official. He shall supervise the enforcement of the Basic Code, make periodic reviews of all building inspection practices of the local building department, make recommendations for improvements of such practices, and report in writing his findings to the building official.

108.22 REVIEW BY THE COMMISSIONER: The Commissioner of the Commonwealth of Massachusetts, Department of Public Safety shall establish districts which shall be supervised by a state inspector of the Division of Inspection. The Commissioner may review, on his own initiative or on the application of any state inspector, any action or refusal or failure of action by any building official the result of which does not comply with the uniform implementation of the Basic Code; and may reverse, modify or annul, in whole or in part, such action except with respect to the specialized codes, provided that no order or action of the Commissioner shall reverse, modify, annul, or contravene any order, action, determination, interpretation or any decision by the Commission or the State Building Code Appeals Board.

108.23 REPORTS: The state inspector shall file with the Commission reports of his periodic reviews and recommendations for improvements of building inspection practices. The format and due dates for these reports shall be determined by the Commission.

SECTION 109.0 RULES AND REGULATIONS

109.1 RULE MAKING AUTHORITY: Under authority granted by Chapter 802, Acts of 1972, as amended, the Commission is empowered in the interest of public safety, health and general welfare, to adopt and promulgate rules and regulations to interpret and implement the provisions of the Basic Code to secure the intent thereof and to establish applicable requirements due to local climatic or other conditions.

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109.11 LICENSING OF CONSTRUCTION SUPERVISORS: Any individual directly supervising persons engaged in construction, reconstruction, alterations, or repairs involving the structural elements of buildings and structures shall be licensed according to the rules and regulations promulgated by the Commission.

109.12 LICENSING OF LABORATORIES AND TEST PERSONNEL: The Commission shall issue rules and regulations for the licensing of individuals, laboratories, and firms responsible for the testing of materials, devices and methods of construction, as provided in section 127.1.

109.13 MANUFACTURED BUILDINGS: The Commission shall issue rules and regulations pursuant to article 19 governing manufactured buildings and building components.

109.14 MOBILE HOMES: The Commission shall issue rules and regulations pursuant to article 19 governing mobile homes.

109.2 ACCEPTED ENGINEERING PRACTICE: In the absence of approved rules, the regulations, specifications and standards listed in the appropriate article or in the appendices shall be deemed to represent accepted engineering practice with respect to the material, equipment, system or method of construction therein specified.

109.3 AMENDMENTS AND PROMULGATION OF RULES: Any person may propose amendments to the Basic Code. Public hearings shall be held in the city of Boston in May and October of each year, and at such other times and places as the Commission may determine, to consider petitions for such amendments. Amendments adopted by the Commission shall be binding and have the full force and effect of law in all cities and towns.

SECTION 110.0 VARIANCES

When there are practical difficulties involved in carrying out structural or mechanical provisions of the Basic Code, the board of appeals may allow a variance or a modification from such provisions as applied for by the owner as provided in section 126.0, provided that the decision of the board shall not conflict with the general objectives of the Basic Code and its enabling legislation and provided that no decision shall be considered by any person or agency as a precedent for future decisions.

SECTION 111.0 INSPECTION

111.1 PRELIMINARY INSPECTIONS: Before issuing a permit, the building official may examine or cause to be examined all buildings, structures and sites for which an application has been filed for a permit to construct, enlarge, alter, repair, remove, demolish or change the use thereof.

111.2 NEW BUILDINGS AND STRUCTURES

111.21 INSPECTION: The building official shall make all required inspections as specified in the provisions of the Basic Code and he shall conduct such inspections from time to time during and upon completion of the work for which he has issued a permit; and he shall maintain a record of all such examinations and inspections and of all violations of the Basic Code. In conjunction with specific construction projects the building official may designate specific inspection points in the course of construction that require the contractor or builder to give the building official twenty-four (24) hours notice prior to the time when those inspections need to be performed. The building official shall make the inspection within forty-eight (48) hours after such notification.

111.3 MANUFACTURED BUILDINGS

111.31 PLANT INSPECTION: Inspection of all manufactured buildings, building components, and mobile homes at the plant shall be performed by a third party which shall be certified and approved by the Commission and monitored by the Department of Public Safety as specified in article 19 and the rules and regulations pursuant thereto.

111.32 SITE INSPECTION: Inspection of all manufactured buildings, building components, and mobile homes at the installation site shall be made by the building official as specified in article 19 and the rules and regulations pursuant thereto.

111.4 EXISTING BUILDINGS.

111.41 PERIODIC INSPECTIONS: The building commissioner or inspector of buildings shall develop plans for the systematic periodic inspection of all existing buildings and structures and shall cause such buildings and structures to be periodically or otherwise inspected as specified in section 108.15 and section 121.4, for compliance with the Basic Code.

111.42 CHANGES OF OCCUPANTS: Before any building or part thereof, except multi-family and one and two-family dwellings (use groups L-2 and L-3), is re-occupied, the building official shall be notified by the owner. The building may be inspected and when in compliance with the Basic Code the building official shall re-certify the building or structure.

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111.43 CHANGES OF OCCUPANTS-DWELLING UNITS: When any dwelling unit is vacated, the building official shall be so notified by the owner before the unit is re-occupied. Upon the determination of the building official, said dwelling unit may be inspected to determine if said unit conforms to the Basic Code.

111.5 FINAL INSPECTION: The owner or his authorized representative shall notify the building official upon completion of the building or structure or part thereof. Prior to the issuance of the certificate of use and occupancy required in section 120.0, a final inspection shall be made and all violations of the approved plans and permit shall be noted and the holder of the permit shall be notified of any discrepancies.

111.6 INSPECTION SERVICES: The building official may accept the written report of inspections from a qualified registered professional engineer or architect or others certified by the Commission; and such inspection report shall specify but not be limited to any violation of the requirements of the Basic Code in respect to egress requirements, floor load, fire grading, occupancy load and use of the buildings.

SECTION 112.0 RIGHT OF ENTRY

In the discharge of his duties, the building official shall have the authority to enter at any reasonable hour any building, structure or premises in the municipality to enforce the provisions of the Basic Code.

If any owner, occupant, or other person refuses impedes, inhibits, interferes with, restricts, or obstructs entry and free access to every part of the structure, operation or premise where inspection authorized by the Basic Code is sought, the building official, or state inspector may:

a) seek in a court of competent jurisdiction a search warrant so as to apprise the owner, occupant or other person concerning the nature of the inspection and justification for it and may seek the assistance of police authorities in presenting said warrant and/or

b) revoke or suspend any license, permit or other permission regulated under the Basic Code where inspection of the structures, operation or premises is sought to determine compliance with the Basic Code.

112.1 OFFICIAL BADGE: The Commission may adopt a badge of office for building officials which shall be displayed for the purpose of identification.

112.2 MUNICIPAL COOPERATION: The assistance and cooperation of police, fire, and health departments and all other municipal officials shall be available to the building official as required in the performance of his duties.

SECTION 113.0 APPLICATION FOR PERMIT

113.1 WHEN PERMIT IS REQUIRED: It shall be unlawful to construct, enlarge, alter, remove or demolish a building, or change the occupancy of a building from one use group to another; or to install or alter any equipment for which provision is made or the installation of which is regulated by the Basic Code, without first filing an application with the building official in writing and obtaining the required permit therefor; except that ordinary repairs as defined in section 102 which do not involve any violation of the Basic Code shall be exempt from this provision.

113.2 FORM OF APPLICATION: The application for a permit shall be submitted in such form as the building official may prescribe and shall be accompanied by the required fee as prescribed in section 118.0.

113.3 BY WHOM APPLICATION IS MADE: Application for a permit shall be made by the owner, as defined in article 2, of the building or structure. The full names and addresses of the owner, applicant, and of the responsible officers, if the owner is a corporate body, shall be stated in the application.

113.4 DESCRIPTION OF WORK: The application shall contain a general description of the proposed work, its location, the use and occupancy of all parts of the building or structure and of all portions of the site or lot not covered by the building; and shall state whether or not fire extinguishing equipment, plumbing, water piping, gasfitting, heating or electrical work is involved, the estimated cost of such work including the general work, and such additional information as may be required by the building commissioner or inspector of buildings. The building commissioner or inspector of buildings may require the facts contained in each application to be certified by the applicant under oath.

113.5 PLANS AND SPECIFICATIONS: The application for the permit shall be accompanied by not less than three (3) copies of specifications and of plans drawn to scale, with sufficient clarity and detail dimensions to show the nature and character of the work to be performed. When quality of materials is essential for conformity to the Basic Code, specific information shall be given to establish such quality; and in no case shall the code be cited or the term "legal" or its equivalent be used as a substitute for specific information. The building official may waive the requirement for filing plans when the work involved is of a minor nature.

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113.51 STRUCTURES SUBJECT TO CONTROL: In those structures subject to control as required in section 128.0, affidavits must be submitted with the permit application, that the individuals and testing laboratories responsible for carrying out the duties of section 128.0 have been licensed and registered by the Commission through the provisions of sections 800.4, 800.41 and 800.42.

113.6 PLOT PLAN: There shall also be filed a plot plan showing to scale the size and location of all the new construction and all existing structures on the site, distances from lot lines and the established street grades; and it shall be drawn in accordance with an accurate boundary line survey. In the case of demolition, the plot plan shall show all construction to be demolished and the location and size of all existing buildings and construction that are to remain on the site or plot. The plot plan shall not be changed except as specified in section 115.4.

113.7 ENGINEERING DETAILS: The building official may require adequate details of structural, mechanical and electrical work, including computations, stress diagrams and other essential technical data to be filed. All such plans and computations shall bear the Massachusetts seal of registration of the qualified registered professional engineer or architect. See 460.12

113.8 AMENDMENTS TO APPLICATION: Subject to the limitations of section 113.9, no amendments or revisions to a plan or other records accompanying the same may be made until the proposed changes have been filed with and approved by the building official; and such approved amendments shall be deemed part of the original application and shall be filed therewith. See 460.12

113.9 TIME LIMITATION OF APPLICATION: An application for a permit for any proposed work shall be deemed to have been abandoned six (6) months after date of filing, unless such application has been diligently prosecuted or a permit shall have been issued; except that for reasonable cause the building official may grant one or more extensions of time for additional periods not exceeding ninety (90) days each.

SECTION 114.0 PERMITS

114.1 ACTION ON APPLICATION: The building commissioner or inspector of buildings shall examine or cause to be examined all applications for permits and amendments thereto within thirty (30) days after filing. Before a permit is granted for the excavation or for the erection of any building or structure, a written statement shall be furnished by the owner from a town or city engineer as to the established grades. If the application or the plans do not conform to the requirements of the Basic Code or of all pertinent laws, he shall reject such application citing the specific sections of the Basic Code or pertinent law. If he is satisfied that the proposed work conforms to the requirements of the Basic Code and all pertinent law applicable thereto, he shall issue a permit.

114.11 REPORT TO ASSESSORS: The building official shall give to the assessors of the municipality written notice of the granting by him of permits for the construction of any buildings or for the removal or demolition or for any substantial alteration or addition thereto. Such notice shall be given within seven (7) days after the granting of each permit, and shall state the name of the person to whom the permit was granted and the location of the building to be constructed, altered, demolished or removed.

114.2 EXPIRATION OF PERMIT: Any permit issued shall become invalid unless the work authorized by it shall have been commenced within six (6) months after its issuance in which case it shall be deemed abandoned, or if the work authorized by such permit is suspended for a period of one (1) year after the time the work is commenced; provided that, for cause, one or more extensions of time, for periods not exceeding ninety (90) days each, may be allowed in writing by the building commissioner or inspector of buildings. For purposes of this section, any permit issued shall not be considered invalid, if such suspension or abandonment is due to a court order prohibiting such work as authorized by such permit. Provided however, in the opinion of the building commissioner, inspector of buildings or state inspector, the person so prohibited by such court order, adequately defends such action before the court.

114.3 PREVIOUS APPROVALS: Nothing in the Basic Code or the rules and regulations pursuant thereto shall affect any building permit lawfully issued, or any building or structure lawfully begun in conformance with such permit, before the effective date of the Basic Code in a city or town, provided, that work under such a permit is commenced within six months after its issue, and that such work, whether under such permit or otherwise lawfully begun, proceeds in good faith continuously to completion so far as is reasonably practicable under the circumstances.

114.4 SIGNATURE TO PERMIT: The building commissioner or inspector of buildings shall affix his signature to every permit.

114.5 APPROVED PLANS: If approved by him the building commissioner or inspector of buildings or supervisor of plans of the Division of Inspection of the Department of Public Safety shall stamp and endorse in writing the plans submitted in accordance with section 113.5; two sets of such stamped and endorsed plans shall be retained and he shall not allow the removal of any such plans and specifications from the department except in his sole discretion for the purposes of examination by another municipal or state department; the other set of plans shall be kept at the building site, open to inspection of the building commissioner, inspector of buildings, Commissioner of the Department of Public Safety or their authorized representative, at all reasonable times.

114.6 REVOCATION OF PERMITS: The building official may revoke a permit or approval issued under the provisions of the Basic Code in case any false statement or misrepresentation of fact in the application of the plans on which the permit or approval was based.

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114.7 APPROVAL IN PART: When application for a permit to erect or add to a building or other structure has been filed, as required in section 113.5, and pending issuance of such permit, the building official may at his discretion issue a special permit for the foundations or any other part of a building or structure. The holder of such a special permit may proceed at his own risk without assurance that a permit for the entire structure will be granted.

114.8 POSTING OF PERMIT: A copy of the building permit provided by the building department shall be kept in view and protected from the weather on the site of operations open to public inspection during the entire time of prosecution of the work and until the certificate of occupancy shall have been issued. The building permit shall serve as an inspection record card to allow the building official conveniently to make entries thereon regarding inspection of the work.

114.9 NOTICE OF START: At least twenty-four (24) hours' notice of start of work under a building permit shall be given to the building official.

SECTION 115.0 CONDITIONS OF PERMIT

115.1 COMPLIANCE WITH CODE: The permit shall be a license to proceed with the work and shall not be construed as authority to violate, cancel or set aside any of the provisions of the Basic Code, except as specifically stipulated by modification or legally granted variation in accordance with section 126.0.

115.2 COMPLIANCE WITH PERMIT: All work shall conform to the stamped or endorsed application and plans for which the permit has been issued and any approved amendments thereto.

115.3 COMPLIANCE WITH PLOT PLAN: All new work shall be located strictly in accordance with the approved plot plan.

115.4 CHANGE IN PLOT PLAN: No lot or plot shall be changed, increased or diminished in area from that shown on the official plot plan, as specified in section 113.6, unless a revised plan showing such changes accompanied by the necessary affidavit of owner or applicant shall have been filed and approved; except that such revised plot plan will not be required if the change is caused by reason of an official street opening, street widening or other public improvement.

SECTION 116.0 DEMOLITION OF BUILDINGS

116.1 SERVICE CONNECTIONS: Before a building can be demolished or removed, the owner or agent shall notify all utilities having service connections within the building such as water, electric, gas,

sewer and other connections. A permit to demolish or remove a building shall not be issued until a release is obtained from the utilities, stating that their respective service connections and appurtenant equipment, such as meters and regulators, have been removed or sealed and plugged in a safe manner.

SECTION 117.0 REMOVAL OF BUILDINGS

117.1 LOT REGULATION: When a building or structure has been demolished or removed and no building operation has been projected or approved, the vacant lot shall be filled with non-organic fill, graded and maintained in conformity with adjacent grades. The lot shall be maintained free from the accumulation of rubbish and all other unsafe or hazardous conditions which endanger the life or health of the public; provisions shall be made to prevent the accumulation of water or damage to any foundations on the premises or the adjoining property; and the necessary retaining walls and fences shall be erected in accordance with the provisions of article 13.

SECTION 118.0 FEES

No permit shall be issued to begin work for new construction, alteration, removal, demolition or other building operation until the fees prescribed by municipal ordinance or by-law shall have been paid to the city or town collector or other municipal agency authorized to collect such fees.

118.1 SPECIAL FEES: The payment of the fee for the construction, alteration, removal or demolition and for all work done in connection with or concurrently with the work contemplated by a building permit shall not relieve the applicant or holder of the permit from the payment of other fees that may be prescribed by law or ordinance for water taps, sewer connections, electrical and plumbing permits, erection of signs and display structures, marquees or other appurtenant structures, or fees for inspections, certificates of use and occupancy or other privileges or requirements, both within and without the jurisdiction of the building department.

SECTION 119.0 FEE COMPUTATION

The permit fees shall be computed according to the fee schedule and procedures adopted in the municipality.

SECTION 120.0 CERTIFICATE OF USE AND OCCUPANCY

120.1 NEW BUILDINGS: No building hereafter erected shall be used or occupied in whole or in part until the certificate of use and occupancy shall have been issued by the building official. The

certificate shall not be issued until all the work has been completed in accordance with the provisions of the approved permits and of the applicable codes for which a permit is required, except as provided in section 120.4.

120.2 BUILDINGS HEREAFTER ALTERED: No building hereafter enlarged, extended or altered to change the use group classification, the fire-grading, the maximum live load capacity, or the occupancy load capacity, in whole or in part, and no building hereafter altered for which a certificate of use and occupancy has not been heretofore issued, shall be occupied or used until the certificate shall have been issued by the building official, certifying that the work has been completed in accordance with the provisions of the approved permits and of the applicable codes for which a permit is required. Any use or occupancy, which was not discontinued during the work of alteration, shall be discontinued within thirty (30) days after the completion of the alteration unless the required certificate is issued by the building official.

120.3 EXISTING BUILDINGS: Upon written request from the owner of an existing building, the building official shall issue a certificate of use and occupancy, provided there are no violations of law or orders of the building official pending, and it is established after inspection and investigation that the alleged use of the building has heretofore existed. Nothing in the Basic Code shall require the removal, alteration or abandonment of, or prevent the continuance of the use and occupancy of a lawfully existing building, unless such use is deemed to endanger public safety and welfare.

120.4 TEMPORARY OCCUPANCY: Upon the request of the holder of a permit, the building official may issue a temporary certificate of occupancy for a building or structure, or part thereof, before the entire work covered by the permit shall have been completed, provided such portion or portions may be occupied safely prior to full completion of the building without endangering life or public welfare, and provided that the agencies having jurisdiction for permits issued under other applicable codes are notified of the decision to issue a temporary certificate.

120.5 CONTENTS OF CERTIFICATE: The certificate shall certify compliance with the provisions of the Basic Code and the purpose for which the building or structure may be used in its several parts; and shall be issued by the building official within ten (10) days after final inspection, provided that the provisions of the approved permits and of the applicable codes for which permits are required have been met. For use groups A, B, C, D and E the certificate of use and occupancy shall specify; the use group, in accordance with the provisions of article 2, the fire grading as defined in article 2 and table 9-1, the maximum live load on all floors as prescribed in article 7, the occupancy load in the building and all parts thereof as defined in article 2 and article 6, and any special stipulations and conditions of the building permit.

SECTION 121.0 POSTING BUILDINGS

121.1 POSTED USE AND OCCUPANCY: A suitably designed placard approved by the building official shall be posted by the owner on all floors of every building and structure and part thereof designed for high hazard, storage, mercantile, industrial or business use (use groups A, B, C, D, and E) as defined in article 2. Said placard shall be securely fastened to the building or structure in a readily visible place, stating: the use group, the fire grading, the live load and the occupancy load.

121.2 POSTED OCCUPANCY LOAD: A suitably designed placard approved by the building official shall be posted by the owner of every building and structure and part thereof designed for use as a place of public assembly or as an institutional building for harboring people for penal, correctional, educational, medical or other care of treatment, or as residential buildings used for hotels, lodging houses, boarding houses, dormitory buildings, multiple-family dwellings (use groups F, H, L-1 and L-2). Said placard shall designate the maximum occupancy load.

121.3 REPLACEMENT OF POSTED SIGNS: All posting signs shall be furnished by the owner and shall be of permanent design; they shall not be removed, or defaced and, if lost, removed or defaced, shall be immediately replaced.

121.4 PERIODIC INSPECTION FOR POSTING: The building official shall periodically inspect all existing buildings and structures except one and two-family dwellings for compliance with the Basic Code in respect to posting; or he may accept the report of such inspections from a qualified registered engineer or architect or others certified by the Commission; and such inspections and reports shall specify any violation of the requirements of the Basic Code in respect to the posting of floor load, fire grading, occupancy load and use group of the building.

SECTION 122.0 VIOLATIONS

122.1 NOTICE OF VIOLATION: The building official shall serve a written notice of violation or order on the owner, as defined in article 2, or the person responsible when in violation of any of the provisions of the Basic Code. Such notice or order shall direct the discontinuance of the illegal action or condition and the abatement of the violation.

122.12 NOTICE OR ORDERS - SERVICE AND CONTENT: Every notice or order authorized by the Basic Code shall be in writing, and shall be served on the person responsible:

a) personally, by any person authorized by the building official: or

b) by any person authorized to serve civil process by leaving a copy of the order or notice at his last and usual place of abode; or

c) by sending him a copy of the order by registered mail, return receipt requested, if he is within the Commonwealth; or

d) if his last and usual place of abode is unkown or outside the Commonwealth, by posting a copy of the order or notice in a conspicuous place on or about the premises in violation and by publishing it for at least three (3) out of five (5) consecutive days in one or more newspapers of general circulation wherein the building or premises affected is situated.

122.2 PROSECUTION OF VIOLATION: If the notice of violation is not complied with within thirty (30) days after service, unless otherwise provided in the Basic Code, the building official may institute the appropriate proceeding at law or in equity in a court of competent jurisdiction to restrain, correct or abate such violation or to require the removal or termination of the unlawful use of the building or structure in violation of the provisions of the Basic Code or of the order or direction made pursuant thereto; or

122.3 VIOLATION PENALTIES: A person who shall violate a provision of the Basic Code shall be punishable by a fine of not more than one thousand dollars ($1,000) or by imprisonment for not more than one year, or both, for each violation. Each day during which any portion of a violation continues shall constitute a separate offense.

122.4 ABATEMENT OF VIOLATION: The imposition of the penalties herein prescribed shall not preclude the building official from instituting appropriate action to prevent unlawful construction or to restrain, correct or abate a violation, or to prevent illegal occupancy of a building, structure or premises or to stop an illegal act, conduct, business or use of a building or structure in or about any premises.

SECTION 123.0 STOP-WORK ORDER

123.1 NOTICE TO OWNER: Upon notice from the building official that any work on a building or structure is being prosecuted contrary to the provisions of the Basic Code or in an unsafe or dangerous manner, such work shall be immediately stopped. The stop-work order shall be in writing and shall be served on the owner, as defined in article 2, or on the person responsible as provided in section 122.12; and shall state the conditions under which work

may be resumed; provided, however, that in instances where immediate action is deemed necessary for public safety or in the public interest, the building official may require that work be stopped upon verbal order.

123.11 POSTING: A stop-work notice shall be posted in a conspicuous place on the job site and can only be removed by the building official.

123.2 UNLAWFUL CONTINUANCE: Any person who shall continue any work in or about the job site after having been served with a stop-work order, except such work as he is directed to perform to remove a violation or unsafe conditions, shall be liable to prosectution as provided in section 122.0.

SECTION 124.0 UNSAFE BUILDINGS - SURVEY BOARD

124.1 DUTIES OF BUILDING OFFICIAL - UNSAFE BUILDINGS: The building official, immediately upon being informed by report or otherwise that a building or other structure or anything attached thereto or connected therewith is dangerous to life or limb or that any building in that city or town is unused, uninhabited or abandoned, and open to the weather, shall inspect the same; and he shall forthwith in writing notify the owner as provided in section 122.12, as defined in article 2, to remove it or make it safe if it appears to him to be dangerous, or to make it secure if it is unused, uninhabited or abandoned and open to the weather. If it appears that such structure would be especially unsafe in case of fire, it shall be deemed dangerous within the meaning hereof, and the building official may affix in a conspicuous place upon its exterior walls a notice of its dangerous condition, which shall not be removed or defaced without authority from him.

124.2 REMOVAL OR MAKING STRUCTURE SAFE - PUTTING UP FENCE: Any person so notified shall be allowed until twelve o'clock noon of the day following the service of the notice in which to begin to remove such structure or make it safe, or to make it secure, and he shall employ sufficient labor speedily to make it safe or remove it or to make it secure; but if the public safety so requires and if the mayor or selectmen so order, the building official may immediately enter upon the premises with the necessary workmen and assistants and cause such unsafe structure to be made safe or demolished without delay and a proper fence put up for the protection of passersby, or to be made secure.

124.3 FAILURE TO REMOVE OR MAKE STRUCTURE SAFE, SURVEY BOARD, SURVEY, REPORT: If an owner, as defined in article 2, of such unsafe structure refuses or neglects to comply with the require-

ments of such notice within the specified time limit, and such structure is not made safe or taken down as ordered, therein, a careful survey of the premises shall be made by a board consisting; in a city, of a city engineer, the head of the fire department, as such term is defined in Section 1 of Chapter 148 of the Massachusetts General Laws Annotated, as amended, and one disinterested person to be appointed by the building official; and, in a town, of a surveyor, the head of the fire department and one disinterested person to be appointed by a building official. In the absence of any of the above officers or individuals, the mayor or selectmen shall designate one or more officers or other suitable persons in place of the officers so named as members of said board. A written report of such survey shall be made, and a copy thereof served on such owner.

SECTION 125.0 EMERGENCY MEASURES

125.1 REMOVAL OF DANGEROUS OR ABANDONED STRUCTURES: If such survey report as outlined in section 124.0, declares such structure to be dangerous or to be unused, uninhabited or abandoned, and open to the weather, and if the owner, as defined in article 2, continues such refusal or neglect the building official shall cause it to be made safe or taken down or to be made secure, and, if the public safety so requires, said building official may at once enter the structure, the land on which it stands or the abutting land or buildings, with such assistance as he may require, and secure the same, and may remove and evict, under the pertinent provisions of Chapter 239 of the Massachusetts General Laws Annotated as amended or otherwise, any tenant or occupant thereof, and may erect such protection for the public by proper fence or otherwise as may be necessary, and for this purpose may close a public highway. In the case of such demolition, the said building official shall cause such lot to be levelled to conform with adjacent grades by a non-organic fill. The costs and charges incurred shall constitute a lien upon the land upon which the structure is located and shall be enforced in an action of contract, and such owner shall for every day's continuance of such refusal or neglect after being so notified, be punished by a fine in accordance with section 122.3. The provisions of the second paragraph of Section 3A of Chapter 139 of the Massachusetts General Laws Annotated as amended, relative to liens for such debt and the collection of claims for such debt, shall apply to any debt referred to in this section, except that the said building official shall act hereunder in place of the mayor or board of selectmen. During the time such order is in effect, it shall be unlawful to use or occupy such structure or any portion thereof for any purpose.

125.2 REMEDY OF PERSON ORDERED TO REMOVE A DANGEROUS STRUCTURE OR MAKE IT SAFE: An owner, as defined in article 2, aggrieved by such order may have the remedy prescribed by Section 2 of Chapter 139 of the Massachusetts General Laws Annotated as amended; provided, that no provision of said Section 2 shall be construed so as to hinder, delay or prevent the building official acting and proceeding under section 125.1; and provided, further, that this section shall not

prevent the city or town from recovering the forfeiture provided in said section 125.1 from the date of the service of the original notice, unless the order is annulled by the jury.

SECTION 126.0 BOARD OF APPEALS

126.1 STATE BUILDING CODE APPEALS BOARD: Whoever is aggrieved by an interpretation, order, requirement, direction or failure to act under the Basic Code by any agency or official of the city, town or region, or agency or official of the State charged with the administration or enforcement of the Basic Code or any of its rules or regulations, excepting any specialized codes, may appeal directly to the State Building Code Appeals Board as provided in section 126.

Whoever is aggrieved by an interpretation, order, requirement, direction or failure to act under the Basic Code by any agency or official of a city, town or region charged with the administration or enforcement of the Basic Code or any of its rules and regulations, excepting any specialized codes, may appeal directly to the State Building Code Appeals Board or may appeal first to a local or regional appeals board and then to the State Building Code Appeals Board as provided in section 126.

In the event an appeal is taken directly to the State Building Code Appeals Board from an interpretation, order, requirement or direction, said appeal shall be filed as specified in section 126.31, with the State Building Code Appeals Board no later than forty-five (45) days after the service of notice thereof of the interpretation, order, requirement or direction.

In the event the appeal is taken directly to the State Building Code Appeals Board for the failure to act, the appeal shall be taken no later than forty-five (45) days after a request to act has been made by the aggrieved person in writing and served to the appropriate building official or chief administrative officer of the state or local agency which fails to act.

If the aggrieved person elects to appeal before the local or regional board, he shall not be allowed to enter such appeal with the State Building Code Appeals Board until such time as the said local or regional board renders a decision, unless the reason for appeal to the State Building Code Appeals Board is the failure of the local or regional board to act.

126.2 MEMBERSHIP

126.21 THREE MEMBER PANEL: The State Building Code Appeals Board (hereinafter referred to in section 126 as the Board) shall consist of the membership of the State Building Code Commission. The chairman of the Commission shall be chairman of the Board. The chairman of the

Board may designate any three (3) members of the Board to act as a three (3) member panel to hold any public hearing under section 126, and to hear testimony and take evidence. The chairman of the Board shall select one (1) of the three (3) members to act as chairman of the said three (3) member panel. If a three (3) member panel is so designated, the three (3) member panel shall act as the appeals board and render a decision as provided in section 126.

126.22 CLERK: The Executive Secretary of the Commission shall designate one (1) of the staff of the Commission to act as Clerk to the Board. The Clerk shall keep a detailed record of all decisions and appeals and a docket book on file with the name of each appeal properly indexed and the disposition of the appeal. Said docket book shall be open to public inspection at all times during normal business hours.

126.23 QUORUM: A majority of the Board shall constitute a quorum if the appeal is heard by the entire Board. If the appeal is heard by a three (3) member panel, two (2) members shall constitute a quorum.

126.3 APPEALS PROCEDURE FOR STATE BUILDING CODE APPEALS BOARD

126.31 ENTRY: Appeals shall be entered on forms provided by the Commission and shall be accompanied by an entry fee of fifty dollars ($50) or such other amounts as may be determined by the Commission from time to time.

The appeal shall be signed by the appellant or his attorney or agent and shall note the name and address of the person or agency in whose behalf the appeal is taken and the name of the person and address wherein service of notice for the appellant is to be made. The appeal shall also state in detail the interpretation, order, requirement, direction or failure to act which are the grounds of the appeal as well as the particular section or sections of the Basic Code which are involved in the appeal and the reasons the appellant advances supporting the appeal.

A copy of the appeal shall be served in accordance with section 122.12 by the appellant on the person or state, regional or local agency from whose action or inaction the appeal is taken, on or before entry of the appeal. A return of service under oath shall be filed with the Board forthwith by the appellant.

126.32 STAY OF PROCEEDINGS: Entry of an appeal shall stay all proceedings in furtherance of the action or failure to act appealed from, unless the state, regional or local agency or any person charged with the administration or enforcement of the Basic Code or any of its rules or regulations presents evidence and the Board or a three (3) member panel or a single member of the Board appointed by the chairman for said purpose, finds that upon the evidence presented a stay would involve imminent peril to life or property. In such an event, stay of all proceedings shall be waived or the Board or three (3) member panel or single member may order such other action necessary to preserve public safety.

Before waiving the stay of proceedings, the Board or three (3) member panel or single member of the Board appointed by the chairman for said purpose, shall hold a hearing and give the appellant and state, regional or local agency or any person claiming that a stay would involve imminent peril to life or property, notice in writing of the hearing not less than twenty-four (24) hours before said hearing.

126.33 DOCUMENTS: Upon entry, the Clerk shall request in writing from the state, city, regional or town officer in charge of the matter on appeal, a copy of the record and all other papers and documents relative to the appeal to be transmitted forthwith to the Board. Said state, city, regional or town officer shall upon receipt of the request of the board transmit forthwith all the papers and documents and a copy of the record relating to the matter on appeal.

126.34 HEARINGS: The chairman of the Board shall fix a convenient time and place for a public hearing. Said hearings shall be held not later than thirty (30) days after the entry of such appeal, unless such time is extended by agreement with the appellant. Any such party may appear in person or by agent or attorney at such hearing. The chairman or clerk shall give notice of the time and place of said hearing to all parties to the hearing and to anyone else requesting notice in writing at least ten (10) days prior thereto. Failure to hold a public hearing within thirty (30) days shall not affect the validity of the appeal or any decision rendered. The board or three (3) member panel in its hearings conducted under this section shall not be bound by strict rules of evidence prevailing in courts of law or equity.

126.4 DECISIONS

126.41 VOTES REQUIRED: If the appeal is conducted by a three (3) member panel, then the concurrence of two (2) of the three (3) members holding the public hearing shall be required. If the appeal is conducted by the entire board, then a majority vote of those hearing the case shall be required.

126.42 STANDARD: The board or a three (3) member panel may vary the application of any provision of this Code to any particular case when in the opinion of the board or a three (3) member panel, the enforcement of the Code would do manifest injustice, provided that the board or three-member panel finds that the decision to grant a variance shall not conflict with the general objectives set forth in Section 18 of Chapter 23B of the General Laws of the Commonwealth or with the general objectives of the Basic Code.

126.43 TIME FOR DECISION: The board shall within thirty (30) days after such hearing, unless such time is extended by agreement of the parties, issue a decision or order reversing, affirming or modifying in whole or in part the order, interpretation, requirement, direction or failure to act which is the subject matter of the appeal.

Failure to render a decision within thirty (30) days shall not affect the validity of any such decision or appeal.

Notice of and a copy of the decision shall be sent by the Clerk to all parties to the appeal and anyone requesting in writing a copy of the decision.

126.44 CONTENTS OF DECISION: All decisions shall be in writing and state findings of fact, conclusions and reasons for decisions. Every decision shall indicate thereon the vote of each member and shall be signed by each member voting. No decision shall be considered by any person or agency as a precedent for future decisions.

126.45 ADDITIONAL POWERS: The board or a three (3) member panel may impose in any decision, limitations both as to time and use, and a continuation of any use permitted may be conditioned upon compliance with future amendments to the Basic Code.

126.5 ENFORCEMENT: Upon receipt of the decision of the Board or a three (3) member panel, the parties to the appeal shall take action forthwith to comply with the decision unless a later time is specified in the decision.

126.6 APPEALS FROM STATE BUILDING CODE APPEALS BOARD: Any person aggrieved by a decision of the State Building Code Appeals Board may appeal to a court of law or equity in conformance with Chapter 30A, Section 14 of the General Laws.

126.7 LOCAL OR REGIONAL BOARD OF APPEALS: Whoever is aggrieved by an interpretation, order, requirement, direction or failure to act under the Basic Code by any agency or official of a city, region or town charged with the administration or enforcement of the Basic Code or any of its rules and regulations may appeal first to the appeals board in that city, region or town and then to the State Building Code Appeals Board as provided in section 126.

In the event an appeal is taken from an interpretation, order, requirement or direction, said appeal shall be filed with the local or regional appeal board no later than forty-five (45) days after the service of notice thereof of the interpretation, order, requirement or direction.

In the event the appeal is taken for the failure to act, the appeal shall be taken no later than forty-five (45) days after a request to act has been made by the aggrieved person in writing and served to the appropriate building official or chief administrative officer of the city, regional or town agency which fails to act.

126.8 LOCAL AND REGIONAL BOARD OF APPEALS

126.81 MEMBERSHIP: Any building code board of appeals duly established by ordinance or by-law or otherwise in a city, region or town and in

existence on January 1, 1975, shall qualify as a local board of appeals under section 126 notwithstanding anything to the contrary contained herein. However, the procedure and rights for appeals for such board of appeals shall be governed by this Code.

If a city, region or town has not duly established by ordinance or by-law or otherwise a local or regional building code appeals board by January 1, 1975, said city, region or town may establish a local or regional board of appeals, hereinafter referred to as the local board of appeals, consisting of five (5) members appointed by the chief administrative officer of the city, region or town: one (1) member appointed for five (5) years, one (1) for four (4) years, one for three (3) years, one for two (2) years and one to serve for one (1) year; and thereafter each new member to serve for five (5) years or until his successor has been appointed.

126.82 QUALIFICATIONS OF LOCAL BOARD MEMBERS: Each member of a local board of appeals established under section 126.81 shall have had at least five (5) years experience in the construction, alteration, repair and maintenance of building and building codes. At least one (1) member shall be a registered structural or civil professional engineer and one (1) member a licensed professional architect.

126.83 CHAIRMAN OF LOCAL OR REGIONAL BOARD: The board shall select one (1) of its members to serve as chairman, and the building official shall designate a person from the department to serve as secretary to the board, who shall keep a detailed record of all proceedings on file in the said building department.

126.84 ABSENCE OF MEMBERS: During the absence of a member of a local board of appeals for reason of disability or disqualification, the chief administrative officer of the city, region or town shall designate a substitute who shall meet the qualifications as outlined in section 126.82.

126.85 QUORUM: A quorum shall be three (3) members, but when five (5) qualified members are not present to consider a specific appeal, either the appellant or appellee may request a postponement of the hearing.

126.86 PROCEDURES: Entry of appeals shall be governed by section 126.31 excepting that the city, region or towns may set their own entry fee.

Upon notice of entry of appeal the local building commissioner or inspector of buildings shall transmit a copy of the record and all the papers and documents to the local board of appeals.

Entry of an appeal shall stay all proceedings in furtherance of the action or failure to act appealed from, unless the building commissioner or inspector of buildings certifies in writing to the local

board of appeals that a stay would involve imminent peril to life or property. Notice in writing of such certification by the building commissioner or inspector of buildings shall be given the appellant at least twenty-four (24) hours prior to the hearing. In such an event a hearing on such stay shall be given first priority and be the first matter heard by the local board of appeal at its next scheduled meeting. The hearing on the appeal shall be held as soon as possible thereafter in accordance with section 126.87.

The local board of appeal may establish its own rules for procedure not established herein or not inconsistent with this Code or the enabling legislation creating a statewide building code.

126.87 HEARINGS: All hearings shall be public and notice of said hearings shall be advertised in a newspaper of general circulation in the city, region or town in which the appeal is taken, at least ten (10) days before said hearing. Notice of the hearing, setting forth the date and time of said hearing shall be mailed by the local board of appeals to all parties and all those who requested notice in writing at least fourteen (14) days before said hearing. Said hearings shall be held not later than thirty (30) days after the entry of such appeal, unless such time is extended by agreement with the appellant. This section as it pertains to notice shall not apply to hearings on a stay as provided in section 126.86.

126.88 DECISIONS OF LOCAL BOARDS: A concurring vote of a majority of all the members shall be required for any decision. The local appeals board may vary the application of this Code to any particular case when in its opinion the enforcement of this Code would do manifest injustice, provided that the decision of the board shall not conflict with the general objectives of the state building code or any of its enabling legislation. The local board of appeal may impose in any decision, limitations both as to time and use, and a continuation of any use permitted may be conditioned upon compliance with future amendments to the Basic Code.

126.89 TIME FOR DECISION: The board shall within thirty (30) days after such hearing, unless such time is extended by agreement of the parties, issue a decision or order reversing, affirming or modifying in whole or in part the order, interpretation, requirement, direction or failure to act which is the subject matter of the appeal.

Failure to render a decision within thirty (30) days shall not affect the validity of any such decision or appeal.

Notice of and a copy of the decision shall be sent by the clerk to all parties to the appeal and to anyone requesting in writing a copy of the decision.

126.90 CONTENTS OF DECISION: All decisions shall be in writing and state findings of fact, conclusions and reasons for the decisions.

Every decision shall indicate thereon the vote of each member and shall be signed by each member voting. Any decision shall not be considered by any person or agency as a precedent for future decisions.

126.91 ENFORCEMENT OF DECISION: If said decision is approved by the State Building Code Appeals Board, all parties to the appeal shall take immediate action in accordance with the decision of the local board unless the person aggrieved by such decision appeals to the State Building Code Appeals Board as provided in section 126.

126.92 COPY OF DECISION: A copy of any decision by a local board of appeals shall be transmitted to the State Building Code Appeals Board within ten (10) days after the rendering of such decision. If the State Building Code Appeals Board disapproves of the said decision of the local board, it may on its own motion, appeal from the local appeals board's decision according to section 126 and call for a hearing de novo.

If the State Building Code Appeals Board does not notify the local board in writing within forty-five (45) days from the date of the local board's decision, the said decision shall be deemed approved; provided that the decision shall not conflict with the general objectives of the state building code and any of its enabling legislation.

126.93 REVIEW: Any person, including the State Building Code Appeals Board, aggrieved by a decision of the local board of appeals, whether or not a previous party to the decision, or any municipal officer or official board of the municipality, may not later than forty-five (45) days after the mailing of the decision of the local board, apply to the State Building Code Appeals Board for a hearing de novo before the state board, in accordance with the regulations contained in section 126.

SECTION 127.0 CONSTRUCTION INDUSTRY SAFETY BOARD

127.1 RULES AND REGULATIONS FOR LICENSING: The commission shall issue rules and regulations for the examination and licensing, and the revocation of licenses of individuals, laboratories and firms responsible for the inspection, control, testing and quality of materials, devices and methods of construction. Said rules and regulations shall require that all testing equipment and procedures shall comply with standards issued by the American Society for Testing and Materials, provided that such standards shall not conflict at any time with any rules and regulations established by and for the said commission.

127.11 CONSTITUTION OF THE CONSTRUCTION INDUSTRY SAFETY BOARD: There shall be a board under the control of the commission called the Construction Industry Safety Board, hereafter in section 127 called the board, which shall consist of nine (9) members, two (2) of whom shall be members of the commission, both of whom shall be ex officio

and voting members of the board, and seven (7) members to be appointed by the chairman of the commission: one of whom shall be a representative of a public structural materials testing agency; one of whom shall be a member of a university faculty engaged in research and teaching of structural materials technology; one of whom shall be a general contractor; one of whom shall be an individual qualified in soils technology and use; one of whom shall be a registered professional engineer who is a structural engineer; and one of whom shall be a registered architect.

127.12 CONSTRUCTION INDUSTRY SAFETY BOARD: The board will review applications for registration for licensing of individuals and laboratories responsible for the inspection, control and testing of construction materials and report to the State Building Code Commission their recommendations. The board will collect information and review cases where disciplinary action against an existing license, whether an individual, laboratory or firm, has been proposed, and make recommendations to the State Building Code Commission. The commission will issue applications, receive payment of registration and licensing fees, and maintain records for the efficient dispatch of the duties of the board. The board shall submit to the commission reports from time to time as requested by the commission, but at least annually.

127.2 TESTING AND EVALUATION GROUP: The State Building Code Commission shall establish and maintain a Testing and Evaluation Group, who will have the responsibility of administering and directing, under the supervision of the commission, the testing and controls for evaluating individual applicants and laboratories wishing to become registered and licensed as required under section 128.9.

127.3 ACTIVITIES REQUIRING LICENSES

127.31 CONCRETE TESTING: On and after the first day of January 1975, no person shall engage in the activities of field testing, plant testing or field inspection of concrete unless such person is licensed to do so by the commission. Any person who violates the provisions of this section, any person who falsifies or counterfeits a license issued by the board, or any person who fraudulently issues or accepts such a license shall be punished as provided in section 122.0 of this Code. The commission shall require strict adherence to the standards of the American Society for Testing and Materials, Designation E-329, entitled "Recommended Practice for Inspection and Testing Agencies for Concrete and Steel as Used in Construction."

128.0 CONTROLLED CONSTRUCTION

128.1 STRUCTURES SUBJECT TO CONTROL: Structures and/or parts thereof which fall within the categories below shall be subject to control as provided in this section:

CATEGORIES

a) one-story structures with a story height of twenty-five (25) feet or more

b) four (4) or more floors of framed construction

c) more than two (2) levels of shored concrete framework

d) piles, caissons, pressure-injected footings

e) underpinnings

f) temporary shoring or sheeting ten (10) feet or more in height

g) masonry bearing walls four (4) stories or more in height

h) structures using post-tensioned concrete

i) four (4) stories or more of precast concrete

j) retaining walls ten (10) feet or more in total height

k) bridges, quays and wharfs.

128.2 WAIVER OF STRUCTURAL PLANS: The examination of structural plans and specifications of structures and/or parts thereof which fall within the categories listed in section 128.1 may be waived by the building official when such plans and specifications are submitted by a qualified registered professional engineer. In such case they shall be accompanied by an affidavit stating that the registered professional engineer has supervised the preparation of the structural design contract documents, and that such documents conform to all provisions of this Code and legal rules adopted under its provisions.

128.3 WAIVER OF STRUCTURAL FIELD EXAMINATION: If required by the building official, the detailed department field inspection of those parts of plans and specifications submitted under the provisions of section 128.2 shall be performed by a qualified registered professional engineer. Such qualified registered professional engineer shall submit an affidavit stating that the structure shall be built under his observation or that of his qualified designated representative and in accordance with the approved contract documents and furthermore, that he will review and approve all working drawings for the construction. Such qualified registered professional engineer or representative shall certify that the construction is in substantial accordance with the drawings and specifications submitted under sections 128.2 and 128.3.

128.4 BUILDING OFFICIAL RESPONSIBILITY: Nothing contained in this section shall have the effect of waiving or limiting the building

official's authority to enforce the Code with respect to examination of plans and field inspections.

128.5 REPORTS: The engineer retained under the provisions of section 128.3 shall submit progress reports to the building official at least weekly. Such reports will terminate upon the completion of the work on the structural elements, submitted in the structural drawings subject to section 128.3 and the exterior enclosure of such structural elements.

128.6 QUALIFICATIONS: The registered professional engineer shall be approved by the building official as qualified by experience in the specific field of construction involved in the building project under consideration.

128.7 PERMIT PROCEDURE: Structures and parts thereof included in the listing of section 128.1 shall be subject to the permit procedures of section 113.51.

128.8 LICENSING OF CONSTRUCTION SUPERVISORS: Construction supervisors operating under the provisions of section 128.0 shall be subject to licensing according to the rules and regulations promulgated by the Commission as provided in section 109.11.

128.9 LICENSING OF LABORATORIES AND TEST PERSONNEL: Laboratories and test personnel operating under the provisions of section 128.0 shall be subject to licensing according to the rules and regulations promulgated by the Commission as provided in section 109.12.

SECTION 129.0 VALIDITY

The provisions of this Code are severable, and if any of its provisions shall be held unconstitutional or otherwise invalid by any court of competent jurisdiction, the decision of such court shall not affect or impair any of the remaining provisions.

ARTICLE 2

DEFINITIONS AND CLASSIFICATIONS

SECTION 200.0 SCOPE

The provisions of this article shall control the classification of all buildings as to use group and type of construction; and the definition of all terms relating thereto in the Commonwealth of Massachusetts.

200.1 APPLICATION OF TERMS: The terms herein defined shall be used to interpret all the applicable provisions of the Basic Code. Definitions of technical terms relating to specific structural and means of egress requirements and to the installation of mechanical, electrical and service equipment are included in the respective articles.

200.2 APPLICATION OF OTHER LAWS: Nothing herein contained shall be deemed to nullify any provisions of the zoning by-law or ordinance of any municipality in the Commonwealth of Massachusetts insofar as those provisions deal exclusively with those powers of regulating zoning granted by the provisions of Chapter 40A and 41 of the Massachusetts General Laws Annotated, as amended.

SECTION 201.0 GENERAL DEFINITIONS

Unless otherwise expressly stated, the following terms shall, for the purpose of the Basic Code, have the meaning indicated in this section.

201.1 TENSE, GENDER AND NUMBER: Words used in the present tense include the future; words used in the masculine gender include the feminine and neuter; the singular number includes the plural and the plural the singular.

201.2 TERMS NOT DEFINED: Where terms are not defined, they shall have their ordinarily accepted meanings or such as the context may imply. Any terms relating to Elevators, Dumbwaiters and Escalators shall have their meaning as defined by Regulations ELV-1 and ELV-2 of the Department of Public Safety of the Commonwealth of Massachusetts. Any terms relating to plumbing and electrical wiring shall have their terms as defined by the Regulations of the Commonwealth of Massachusetts pertaining to plumbing and electrical wiring.

ABUT: to touch or be contingent.

ACCEPTED ENGINEERING PRACTICE: that which conforms to accepted principles, tests or standards of nationally recognized technical or scientific authorities.

ACCESSORY STRUCTURE: a building the use of which is incidental to that of the main building and which is located on the same lot.

ACCESSORY USE: a use incidental to the principal use of a building as defined or limited by the provisions of the local zoning laws.

ACCREDITED AUTHORITATIVE AGENCIES: (see appendix A).

ADDITION: an extension or increase in floor area or height of a building or structure.

AIR CONDITIONING: (see section 1801.0).

AIR DUCT: (see section 1801.0).

AIRPLANE HANGAR: (see section 401.0).

ALLEY: a secondary thoroughfare less than thirty (30) feet in width dedicated for the public use of vehicles and pedestrians affording access to abutting property.

ALTERATION: change in or addition to a building which reduces the means of exit or fire resistance or changes its structural support, use or occupancy.

ALTERNATE INSPECTOR: a person appointed to act in the absence of the inspector of buildings in case of illness, disability, or conflict of interest. (see section 107.12)

AMUSEMENT DEVICE: a device or structure, open to the public, by which individuals are conveyed or moved in an unusual manner for diversion.

APARTMENT: a dwelling unit as defined in this Code.

APPROVED: approved by the Commission, the building official or other authority having jurisdiction.

APPROVED COMBUSTIBLE PLASTIC: (see section 1401.0).

APPROVED MATERIAL, EQUIPMENT AND METHODS: approved by the Commission or by an agency approved by the Commission.

APPROVED PLASTIC: (see section 2001.0).

APPROVED RULES: those rules approved by the State Building Code Commission unless otherwise specified.

APPURTENANT STRUCTURE: a device or structure attached to the exterior or erected on the roof of a building designed to support service equipment or used in connection therewith, or for advertising or display purposes, or other similar uses.

ARCHITECTURAL TERRA COTTA: (see section 801.0).

AISLE:-

AREA (BUILDING): the maximum horizontally projected areas of the building at or above grade, exclusive of court and vent shafts.

AREA (FLOOR): the useable area of each story of a building or portion thereof, within surrounding exterior walls. (see section 601.0).

AREAWAY: (form of construction). An uncovered subsurface space adjacent to a building.

ASHLAR FACING: (see section 801.0).

ASHLAR MASONRY: (see section 801.0).

ATTIC: the space between the ceiling beams of the top habitable story and the roof rafters.

-HABITABLE ATTIC: a habitable attic is an attic which has a stairway as a means of access and egress and in which the ceiling area at a height of seven and one-third (7-1/3) feet above the attic floor is not more than one-third (1/3) the area of the floor next below.

AUTOMATIC: a device or system which has the capability of providing a predetermined function when predetermined conditions exist.

AUTOMATIC COLLAPSIBLE REVOLVING DOOR: (see section 601.0).

AUTOMATIC FIRE ALARM SYSTEM: (see section 1201.0).

AUTOMATIC FIRE DOOR: (see section 901.0).

AUTOMATIC SPRINKLER HEAD: (see section 1201.0).

AUTOMATIC SPRINKLER SYSTEM: (see section 1201.0).

AUTOMATIC WATER SUPPLY SOURCE: (see section 1201.0).

BASEMENT: a portion of the building partially underground, but having less than half its clear height below the grade plane (see cellar).

BASIC CODE: the State Building Code of the Commonwealth of Massachusetts, also referred to as this Code.

BAY: (Part of a structure). The space between two (2) adjacent piers or mullions or between two (2) adjacent lines of columns.

BAY WINDOW: a window projecting beyond the wall line of the building and extending down to the foundations.

BILLBOARD: (see section 1401.0).

BOILER: (see section 1101.0).

BRICK: (see section 801.0).

BUILDING: (see structure) A structure enclosed within exterior walls or firewalls, built, erected and framed of a combination of any materials, whether portable or fixed, having a roof, to form a structure for the shelter of persons, animals or property. For the purpose of this definition, "roof" shall include an awning or any similar covering, whether or not permanent in nature. The word "building" shall be construed where the context requires as though followed by the words "or part or parts thereof."

BUILDING (EXISTING): any structure erected or one for which a legal building permit has been issued prior to the adoption of the Basic Code.

BUILDING COMMISSIONER: The administrative chief of the building department in a municipality who is charged with the administration and enforcement of the Basic Code. See also inspector of buildings. (see section 107.1)

BUILDING COMPONENT: (see section 1901.0)

BUILDING DEPARTMENT: The person, body, agency, department or office of any municipality charged with the administration and enforcement of the Basic Code.

BUILDING OFFICIAL: The officer or other designated authority charged with the administration and enforcement of the Basic Code. Building official as used herein includes the building commissioner or the inspector of buildings and the local inspector.

BUILDING LINE: The line established by law, beyond which a building shall not extend, except as specifically provided by law.

BUILDING SERVICE EQUIPMENT: The mechanical, electrical and elevator equipment, including piping, wiring, fixtures and other accessories, which provide sanitation, lighting, heating, ventilation, fire-fighting and transportation facilities essential for the habitable occupancy of the building or structure for its designated use and occupancy.

BUILDING SITE: The area occupied by a building or structure, including the yards and courts required for light and ventilation, and such areas that are prescribed for access to the street.

BUILDING SYSTEM: (see section 1901.0)

BUTTRESS: (see section 801.0)

CELLAR: The portion of the building partially underground, having half or more than half of its clear height below the grade plane.

CENTRAL STATION SYSTEM: (see section 1201.0)

CERAMIC SURFACE UNIT: (see section 801.0)

CERTIFICATE OF USE AND OCCUPANCY: The certificate issued by the building official which permits the use of a building in accordance with the approved plans and specifications and which certifies compliance with the provisions of law for the use and occupancy of the building in its several parts, together with any special stipulations or conditions of the building permit.

CERTIFICATION: (see section 1901.0)

CHANGE OF USE: An alteration by change of use in a building heretofore existing to a new use group which imposes other special provisions of law governing building construction, equipment or means of egress.

CHIMNEY: (see section 1001.0)

CHIMNEY CONNECTOR: (see section 1001.0)

CLAY MASONRY UNIT: (see section 801.0)

CLOSED SIGN: (see section 1401.0)

COMBUSTIBLE: (see section 901.0)

COMBUSTIBLE (MATERIAL): (see section 901.0)

COLD-FORMED STEEL CONSTRUCTION: (see section 801.0)

COMBINATION OF MUNICIPALITIES: Any two or more cities and/or towns who have agreed to combine in order to share costs necessary for the administration and enforcement of the Basic Code in the said cities and/or towns.

COMBINATION SIGN: (see section 1401.0)

COMBUSTIBLE FIRE DAMPER: (see section 901.0)

COMMENCED: Any physical action begun on the job site for the purposes of construction, for which a building permit is required.

COMMISSION: (see State Building Code Commission)

COMMON HALLWAY: (see section 601.0)

COMPLIANCE ASSURANCE PROGRAM: (see section 1901.0)

CONCRETE: (see section 801.0)

CLASSROOM:—

CONCRETE BRICK: (see section 801.0)

CONCRETE MASONRY UNIT: (see section 801.0)

CONFLAGRATION HAZARD: (see section 901.0)

CONTROLLED CONSTRUCTION: (see sections 128.0 and 701.0)

CONTROLLED MATERIALS: (see sections 701.0 and 722.0)

CONSTRUCTION EQUIPMENT: The construction machinery, tools, derricks, hoists, scaffolds, platforms, runways, ladders and all material handling equipment safeguards and protective devices used in construction operations.

CONSTRUCTION OPERATION: The erection, alteration, repair, renovation, demolition or removal of any building or structure; and the excavation, filling, grading and regulation of lots in connection therewith.

CONSTRUCTION SUPERVISOR: Any individual directly supervising persons engaged in construction, reconstruction, alterations or repairs involving the structural elements of buildings and structures.

CORRIDOR: (see passageway, section 601.0)

COURT: (see section 501.0)

CURB LEVEL: The elevation of the street curb as established in accordance with law.

-BUILDING OR WALL HEIGHT: The elevation of the street grade opposite the center of the wall nearest to and facing the street lot line.

-EXCAVATIONS: The elevation of the street grade nearest to the point of excavation.

DAY CARE CENTER: Any facility operated on a regular basis whether known as a day nursery, nursery school, kindergarten, child play school, progressive school, child development center, or preschool, or known under any other name, which receives children not of common parentage under seven (7) years of age or under sixteen (16) years of age if such children have special needs for non-residential custody and care during part or all of the day separate from their parents. Day care center shall not include: any part of a public school system; any part of a private, organized educational system unless the services of such system are primarily limited to kindergarten, nursery or related preschool services; a Sunday school conducted by a religious

institution; a facility operated by a religious organization where children are cared for during short periods of time while persons responsible for such children are attending religious services; a family day care home, as defined by section nine (9) of chapter 28A of the MGLA as amended; an informal cooperative arrangement among neighbors or relatives; or the occasional care of children with or without compensation therefor.

DELUGE SYSTEM: (see section 1201.0)

DISPLAY SIGN: (see section 1401.0)

DISPLAY SURFACE: (see section 1401.0)

DOORWAY: The clear width of the opening protected by a door, subject to the width reduction provisions of this Code.

DRAFT HOOD: (see section 1001.0)

DRAFT REGULATOR: (see section 1001.0)

DUCT: (see section 1001.0)

DWELLINGS:

-ONE-FAMILY DWELLING: A building containing one (1) dwelling unit with not more than four (4) lodgers or boarders.

-TWO-FAMILY DWELLING: A building containing two (2) dwelling units with not more than four (4) lodgers or boarders per family, but not more than twenty (20) individuals.

-MULTI-FAMILY APARTMENT HOUSE: Any building or portion thereof used as a multiple dwelling for the purpose of providing three (3) or more separate dwelling units with shared means of egress and other essential facilities.

-BOARDING HOUSE, TOURIST HOME: A building arranged or used for lodging, with or without meals, for compensation by more than five (5) and not more than twenty (20) individuals.

-LODGING HOUSE: Any building or portion thereof containing not more than five (5) guest rooms which can accommodate not more than twenty (20) guests where rent is paid in money, goods, labor or otherwise. A lodging house shall comply with all the requirements for dwellings.

-DORMITORY: A space in a unit where group sleeping accommodations are provided, with or without meals, for persons not members of the same family group, in one room, or in a series of closely associated rooms under joint occupancy and single management, as in college dormitories, fraternity houses, military barracks and ski lodges.

-HOTEL: Any building containing six (6) or more guest rooms intended or designed to be used, or which are used, rented or hired out to be occupied or which are occupied for sleeping purposes by guests.

DWELLING UNIT: One or more rooms arranged for the use of one (1) or more individuals living together as a single housekeeping unit, with cooking, living, sanitary and sleeping facilities.

ESCALATOR: (see section 601.0)

EXISTING BUILDING: A building erected prior to the adoption of the Basic Code, or one for which a legal building permit has been issued.

EXITWAY: (see section 601.0)

EXITWAY ACCESS: (see section 601.0)

EXITWAY DISCHARGE: (see section 601.0)

EXITWAY DISCHARGE COURT: (see section 401.0)

EXTERIOR MASONRY WALL CONSTRUCTION: (see section 217.0)

FIRE AREA: The floor area enclosed and bounded by fire walls or exterior walls of a building to restrict the spread of fire.

FIRE DAMPER: (see section 1801.0)

FIRE DISTRICTS: The territories defined and limited by the provisions of the Basic Code for the restriction of types of construction.

FIRE DIVISION: (see section 901.0)

FIRE DOOR: (see section 901.0)

FIRE DOOR ASSEMBLY: (see section 901.0)

FIRE DRILL: (see section 1201.0)

FIRE GRADING: (see sections 202, 901, 902 and Table 9-1)

FIRE HAZARD: (see section 901.0)

FIRE LIMITS: (see section 301.0)

FIRE PARTITION: (see section 901.0)

FIRE PREVENTION: (see section 901.0)

FIRE PROTECTION: (see section 901.0)

FIRE SAFETY: (see section 901.0)

FIRE SEPARATION: (see section 901.0)

FIRE TOWER: Smokeproof tower (see section 601.0)

FIRE WALL: (see section 901.0)

FIRE WINDOW: (see section 901.0)

FIREPROOF CONSTRUCTION: (see section 215.0)

FIRERESISTANCE: (see section 901.0)

FIRERESISTANCE RATING: (see section 901.0)

FIRERESISTIVE PARTITION: (see section 901.0)

FIRERETARDANT CONSTRUCTION: (see section 901.0)

FIRERETARDANT LUMBER: (see section 901.0)

FLAME SPREAD: (see section 901.0)

FLAME SPREAD RATING: (see section 901.0)

FLAMERESISTANCE: (see section 901.0)

FLAMMABLE: (see section 401.0)

FLAMMABLE FILM: (see section 401.0)

FLEXIBLE TUBING: (see section 1001.0)

FLOOR AREA, GROSS: (see section 601.0)

FLOOR AREA, NET: (see section 601.0)

FLOOR FILL: (see section 801.0)

FLOOR FILLING: (see section 801.0)

FLOOR FINISH: (see section 801.0)

FLOOR FURNACE: (see section 1101.0)

FLUE: (see section 1001.0)

FORCED AND INDUCED DRAFT FUEL BURNING APPLIANCES: (see section 1001.0)

FORMED STEEL: (see section 701.0)

FOUNDATION WALL: (see section 701.0)

FOYER: (see section 401.0)

FRAME CONSTRUCTION: (see section 218.0)

FUEL OIL: (see section 401.0)

GARAGE: (see section 401.0)

GAS VENTS: (see section 1001.0)

GRADE: A reference plane representing the average of finished ground level adjoining the building at all exterior walls.

GRADE BEAM: A beam of masonry, reinforced concrete or structural steel incased in concrete at or below grade that receives the load from the superstructure and transmits it to the foundation.

GRADE HALLWAY: (see section 601.0)

GRANDSTAND: (see section 401.0)

GROUND SIGN: (see section 1401.0)

GROUP RESIDENCE: (see section 433.1)

HABITABLE ROOM: (see section 501.0)

HALLWAY, GRADE: (see section 601.0-Grade hallway)

HALLWAY, COMMON: (see section 601.0-Common hallway)

HAZARD: (Low, moderate, high. see section 901.0).

HEATING APPLIANCES: (see section 1101.0)

HEIGHT, BUILDING: The vertical distance from the grade to the highest point of the roof. When a building faces more than one street the height shall be measured from the average of the grade at the center line of each street front.

-COURT: The vertical distance from the lowest level of the court to the mean height of the top of the enclosing walls.

-STORY: The vertical distance from top to top of two (2) successive tiers of beams or finished floor surfaces; and, for the topmost story, from the top of the floor finish to the top of the ceiling joists, or, where there is no ceiling, to the top of the roof rafters.

-WALL: The vertical distance from the foundation wall or other immediate support of such wall to the top of the wall.

HEREAFTER: After the time that the Basic Code becomes effective.

HERETOFORE: Before the time that the Basic Code became effective.

HIGH HAZARD USE: (see section 203.0)

HIGH PRESSURE BOILER: (see section 1101.0)

HOLLOW BRICK: (see section 801.0)

HOOD: (see section 1001.0)

HORIZONTAL EXIT: (see section 601.0)

HORIZONTAL FIRE LINE: (see section 1201.0)

INFLAMMABLE: (see Flammable. section 401.0)

INSPECTOR OF BUILDINGS: The administrative chief of the building department in a municipality who is charged with the administration and enforcement of the Basic Code. See also building commissioner. (see section 107.1)

INSTALLATION: (see section 1901.0)

INTERIOR LOT LINE: Any lot line other than one adjoining a street or public space.

KEROSENE: (see section 401.0)

LABEL: (see section 1901.0)

LIGHT GAUGE STEEL CONSTRUCTION: (see section 701.0)

LIGHT-DIFFUSING SYSTEM: (see section 2001.0)

LIMIT CONTROL: (see section 1801.0)

LINTEL: (see section 801.0)

LOAD: (see section 701.0)

LOBBY: (see section 401.0)

LOCAL ENFORCEMENT AGENCY: (see section 1901.0)

LOCAL INSPECTOR: A person in a municipality who assists the building commissioner or inspector of buildings in the performance of his duties and is charged with the enforcement of the Basic Code. (see section 107.11)

LOT: A portion or parcel of land considered as a unit.

-CORNER LOT: One with two (2) adjacent sides abutting upon streets or other public spaces.

-INTERIOR LOT: One which faces on one street or with opposite sides on two (2) streets.

LOT LINE: A line dividing one lot from another, or from a street or any public place.

LOW HAZARD USE: (see section 204.2)

LOW PRESSURE BOILER: (see section 1101.0)

MANUAL FIRE-ALARM SYSTEM: (see section 1201.0)

MANUFACTURED BUILDING: (see section 1901.0)

MARQUEE: (see section 1401.0)

MARQUEE SIGN: (see section 1401.0)

MASONRY: (see section 801.0)

MEANS OF EGRESS: A continuous and unobstructed path of travel from any point in a building or structure to a public space and consists of three (3) separate and distinct parts: (a) the exitway access, (b) the exitway, and (c) the exitway discharge; a means of egress comprises the vertical and horizontal means of travel and shall include intervening room spaces, doors, hallways, corridors, passageways, balconies, ramps, stairs, enclosures, lobbies, escalators, horizontal exits, courts and yards.

MECHANICAL VENTILATION: (see section 1801.0)

MECHANICAL WARM AIR FURNACE: (see section 1101.0)

MEZZANINE: An intermediate floor between the floor and ceiling of any story, and covering less than thirty-three and one-third (33 1/3) percent of the floor area immediately below.

MINIMUM HABITABLE ROOM HEIGHT: (see section 501.0)

MINIMUM HABITABLE ROOM SIZE: (see section 501.0)

MOBILE HOME: (see sections 401.0 and 1901.0)

MOBILE HOME SYSTEM: (see section 1901.0)

MODERATE HAZARD USE: (see section 204.1)

MORTAR: (see section 801.0)

MOTEL: A hotel as defined in this Code.

MOTOR FUEL SERVICE STATION: (Oil selling station, Gasoline service station, section 401.0)

MOTOR VEHICLE REPAIR SHOP: (see section 401.0)

MOVING STAIRWAY: (see section 601.0)

MUNICIPALITY: Any city or town in the Commonwealth of Massachusetts. The word "municipality" shall be construed, where the context requires, as though followed by the words "or combination of municipalities."

NOMINAL DIMENSION: (see section 801.0)

NON-AUTOMATIC SPRINKLER SYSTEM: (see section 1201.0)

NONCOMBUSTIBLE BUILDING MATERIAL: (incombustible)(see section 901.0)

NONCOMBUSTIBLE CONSTRUCTION: (see section 216.0)

NOTICE: (see section 122.12)

OCCUPANCY: The purpose for which a building, or part thereof, is used or intended to be used.

OCCUPANCY LOAD: The number of individuals normally occupying the building or part thereof, or for which the exitway facilities have been designed.

OCCUPANTS: Persons normally located within the building or structure or part thereof.

OCCUPIABLE ROOM: (see section 501.0)

OCCUPIED: As applied to a building, shall be construed as though followed by the words "or intended, arranged or designed to be occupied."

ONE-SOURCE SPRINKLER SYSTEM: (see section 1201.0)

OPEN SIGN: (see section 1401.0)

ORDINARY MATERIALS: (see section 701.0 and 722.0)

ORIEL WINDOW: A window projected beyond and suspended from the wall of the building or cantilevered therefrom.

OWNER: Every person who alone or jointly or severally with others (a) has legal title to any building or structure; or (b) has care, charge, or control of any building or structure in any capacity including but not limited to agent, executor, executrix, administrator, administratrix, trustee or guardian of the estate of the holder of legal title; or (c) lessee under a written letting agreement; or (d) mortgagee in possession; or (e) agent, trustee or other person appointed by the courts. Each such person is bound to comply with the provisions of the Basic Code.

PANEL: (part of a structure). The section of a floor or wall comprised between the supporting frame of two (2) adjacent rows of columns and girders, or column bands of floor construction.

PANEL WALL: (see wall-skeleton or panel)

PARKING STRUCTURE, OPEN: (see section 401.0)

PARTIAL SPRINKLER SYSTEM: (see section 1201.0)

PARTY WALL: (see section 901.0)

PASSAGEWAY: (see section 601.0-grade hallway)

PENTHOUSE: An enclosed structure above the roof of a building, other than a roof structure or bulkhead occupying not more than thirty-three and one-third (33 1/3) percent of the roof area.

PERMIT: An official document or certificate issued by the authority having jurisdiction authorizing performance of a specified activity.

PERSON: Every individual, partnership, corporation, firm, association, trustee or group, including a city, town, county, authority or other governmental unit, owning property or conducting any activity regulated by this Basic Code.

PLACE OF ASSEMBLY: A room or space accommodating fifty (50) or more individuals for religious, recreational, educational, political, social or amusement purposes or for the consumption of food and drink, including all connected rooms or spaces with a common means of egress and entrance.

PLACE OF OUTDOOR ASSEMBLY: Premises used or intended to be used for public gatherings of two hundred (200) or more individuals in other than buildings.

PLASTIC GLAZING: (see section 2001.0)

PLASTIC ROOF PANELS: (see section 2001.0)

PLASTIC WALL PANEL: (see section 2001.0)

PLENUM CHAMBER: (see section 1801.0)

POLE SIGNS: (see section 1401.0)

POSTED USE AND OCCUPANCY: The posted classification of a building in respect to use, fire grading, floor load and occupancy load.

POSTED SIGN: The tablet, card or plate which defines the use, occupancy, fire grading and floor loads of each story, floor or parts thereof for which the building or part thereof has been approved.

POSTER PANEL: (see section 1401.0)

PRESERVATIVE TREATED WOOD: (see section 801.0)

PRIMARY MEMBER: (see section 701.0)

PROFESSIONAL ENGINEER OR ARCHITECT: (see qualified registered professional engineer or architect)

PROJECTING SIGN: (see section 1401.0)

PROTECTED CONSTRUCTION: That in which all structural members are constructed, chemically treated, covered or protected so that the individual unit or the combined assemblage of all such units has the required fireresistance rating specified for its particular use or application in table 5, and includes protected-frame, protected-ordinary and protected-noncombustible construction.

PUBLIC PARKING DECKS: (see section 401.0)

PUBLIC SPACE: A legal open space on the premises, accessible to a public way or street, such as yards, courts or open spaces permanently devoted to public use which abuts the premises.

PYROXYLIN PLASTIC: (see section 401.0)

QUALIFIED REGISTERED PROFESSIONAL ENGINEER OR ARCHITECT: A registered professional engineer who is qualified by his experience and training to perform the work for which he is responsible.

REFRIGERANT: (see section 1801.0)

REFRIGERATION: (see section 1801.0)

REINFORCED CONCRETE: (see section 801.0)

REINFORCED THERMOSETTING PLASTIC: (see section 2001.0)

RAISED PLATFORM:-

REMOVAL OF BUILDINGS: The moving of a building or structure from one site to another.

REPAIR: The reconstruction or renewal of any part of an existing building for the purpose of its maintenance.

REQUIRED: Shall be construed to be mandatory by provisions of the Basic Code.

ROOF: The roof slab or deck with its supporting members, not including vertical supports.

ROOF COVERING: The covering applied to the roof for weather resistance, fireresistance or appearance.

ROOF SIGN: (see section 1401.0)

ROOF STRUCTURE: An enclosed structure on or above the roof of any part of a building.

RUBBLE MASONRY: (see section 801.0)

RUNWAY: (see section 1301.0)

RUPTURE MEMBER: (see section 1801.0)

SCAFFOLD: Any elevated platform which is used for supporting workmen, materials, or both.

SECONDARY MEMBER: (see section 701.0)

SELF-CLOSING: (see section 601.0)

SERVICE EQUIPMENT: (see building service equipment)

SHALL: The term when used in the Basic Code shall be construed as mandatory.

SHAFT: (see section 901.0)

SLIDESCAPE: (see section 601.0)

SLOW-BURNING PLASTIC: (see check test). (see section 2001.0)

SMOKE DETECTOR: (see section 1801.0)

SMOKEPIPE: (see section 1001.0)

SMOKEPROOF TOWER: (fire tower, see section 601.0)

SMOKESTACK: (see section 1001.0)

SchoolHouse:-

SOLID MASONRY UNIT: (see section 801.0)

SPACE HEATER: (see section 1101.0)

SPECIALIZED CODE: All building codes, rules or regulations pertaining to building construction, reconstruction, alteration, repair or demolition promulgated by and under the authority of the various agencies which have been authorized from time to time by the General Court of the Commonwealth of Massachusetts.

SPRINKLER SYSTEM: (see section 1201.0)

SPRINKLERED: (see section 1201.0)

STAGE: (see section 401.0)

STAIRWAY: (see section 601.0)

STANDARD FIRE TEST: (see section 901.0)

STANDPIPE: (see section 1201.0)

STATE BUILDING CODE: The State Building Code and amendments and rules and regulations thereto as promulgated by the State Building Code Commission under sections sixteen (16), seventeen (17) and eighteen (18) of Chapter twenty-three (23)B of the Massachusetts General Laws Annotated as amended.

STATE BUILDING CODE COMMISSION: The Massachusetts State Building Code Commission established by section sixteen (16) of chapter twenty-three (23)B of the Massachusetts General Laws Annotated as amended.

STATE INSPECTOR: An employee of the Division of Inspection, State Department of Public Safety who is charged with administering and enforcing the Basic Code relative to any structure or building or parts thereof that are owned by the Commonwealth or any departments, commissions, agencies or authorities of the Commonwealth. The state inspector is also charged with supervising the enforcement of the Basic Code relative to all buildings and structures other than those owned by the Commonwealth. (see section 108.2)

STEEL JOIST: (see section 701.0)

STORY: That portion of a building included between the upper surface of a floor and upper surface of the floor or roof next above. (see also mezzanine)

STORY, FIRST: A story in which the finished floor is nearest to, and the ceiling of which is six (6) feet or more above the average grade of the sidewalk or ground adjoining.

STREET: A primary thoroughfare or highway thirty (30) feet or more in width as dedicated or devoted to public use by legal mapping use, or other lawful means.

STREET LOT LINE: The lot line dividing a lot from a street or other public space.

STRUCTURAL CLAY TILE: (see section 801.0)

STRUCTURAL STEEL MEMBER: (see section 701.0 and 801.0)

STRUCTURE: A combination of materials assembled at a fixed location to give support or shelter, such as a building, framework, retaining wall, tent, reviewing stand, platform, bin, fence, sign, flagpole, recreational tramway, mast for radio antenna or the like. The word "structure" shall be construed, where the context requires, as though followed by the words "or part or parts thereof."

SUPERVISED SPRINKLER SYSTEM: (see section 1201.0)

TECHNICAL CODE COUNCIL: (see section 100.5)

TEMPORARY SIGN: (see section 1401.0)

THEATRE: A building or part thereof in which it is intended to make a business of the presentation of performances for the entertainment of spectators, which has a seating capacity of more than four hundred (400), with a stage which can be used for scenery and other appliances. (see section 208.1)

THERMOPLASTIC MATERIAL: (see section 2001.0)

THERMOSETTING MATERIAL: (see section 2001.0)

TILE: (see section 801.0)

TON OF REFRIGERATION: (see section 1801.0)

TRAVEL TRAILERS: (see section 401.0)

TWO-SOURCE SYSTEM: (see section 1201.0)

UNFIRED PRESSURE VESSEL: (see section 1101.0)

UNIT HEATER: (see section 1101.0)

USE GROUP: The classification of a building or structure based on the purpose for which it is used.

USE-USED: The purpose for which the building or structure is designed, used or intended to be used.

VENT: (see section 1001.0)

VENT CONNECTOR: (see section 1001.0)

VENT DUCT: (see section 1801.0)

VENT PIPE (GAS): (see section 1001.0)

VENT SYSTEM: (see section 1001.0)

VENTILATION: (see section 1801.0)

VERTICAL OPENING: An opening through a floor or roof.

VOLATILE FLAMMABLE: (see section 401.0)

WALL: (see also section 801.0 and section 901.0)

-APRON WALL: That portion of a skeleton wall below the sill of a window.

-BEARING WALL: A wall supporting any vertical load in addition to its own weight.

-CURTIN WALL: A non-bearing enclosure wall not supported at each story.

-DIVISION WALL: A wall used to divide the floor area of a building or structure into separate parts for fire protection, for different uses, for restricted occupancy, or for other purposes specified in the Basic Code.

-NON-BEARING WALL: A wall which supports no vertical load other than its own weight.

-PARAPET WALL: That part of any wall entirely above the roof line.

-RETAINING WALL: A wall designed to prevent the lateral displacement of soil or other material.

-SKELETON OR PANEL WALL: A non-bearing wall supported by each story on a skeleton frame.

-SPANDREL WALL: That portion of a skeleton wall above the head of a window or door.

WALL HEATER: (see section 1101.0)

WALL SIGN: (see section 1401.0)

WARM AIR FURNACE: (see section 1101.0)

WATER CURTAIN: (see section 1201.0)

WINDER: (see section 601.0)

WRITING: The term shall be construed to include handwriting, typewriting, printing, photo-offset or any other form of reproduction in legible symbols or characters.

YARD: (see section 501.0)

ZONING: The reservation of certain specified areas within a community or city for building and structures, or use of land, for certain purposes with other limitations such as height, lot coverage and other stipulated requirements.

SECTION 202.0 USE GROUP CLASSIFICATION

Every building, structure and space therein shall be classified with respect to use in one of the following use groups: group A, high hazard; group B, storage; group C, mercantile; group D, industrial; group E, business; group F, assembly; group H, institutional; group L, residential; and group M, miscellaneous buildings.

202.1 FIRE GRADING OF BUILDINGS: All buildings and structures shall be graded in accordance with the degree of fire hazard of their use. Such fire hazard may be expressed in terms of hours and fractions of an hour, fire loading or rate of energy contribution, so long as the building official can adequately relate such fire hazard to the requirements of this code. In case of doubt the building official may accept an evaluation of fire hazard from a qualified registered professional engineer or architect.

202.2 NEW USES: The building official shall establish by approved rules the degree of hazard involved and the fire grading of any use not specifically provided for in this Code, or may require the evaluations of such fire hazard by a qualified registered professional engineer or architect.

SECTION 203.0 USE GROUP A, HIGH HAZARD BUILDINGS

All buildings and structures or parts thereof shall be classified in the high hazard use group which are used for the storage, manufacture or processing of highly combustible or explosive products or materials which are likely to burn with extreme rapidity or which may produce poisonous fumes or explosions; for storage or manufacturing which involves highly corrosive, toxic or noxious alkalies, acids or other liquids or chemicals producing flame, fume, explosive, poisonous, irritant or corrosive gases; and for the storage or processing of any materials producing explosive mixtures of dust or which result in the division of matter into fine particles subject to spontaneous ignition.

203.1 LIST OF HIGH HAZARD USES: The processes, materials and manufactures listed in table 2-1 are indicative of and shall be included among high hazard uses.

TABLE 2-1 - USE GROUP A, HIGH HAZARD USES

Acetylene gas and gases under pressure of fifteen (15) pounds or more and in quantities of greater than twenty-five hundred (2500) cubic feet; including hydrogen, illuminating natural, ammonia, chlorine, phosgene, sulphur dioxide, methyl oxide and all gases subject to explosion, fume or toxic hazard.

Artificial flowers and synthetic leather manufacture.

Ammunition, explosives and fireworks manufacture.

Celluloid and celluloid products.

Cereal, feed, flour and grist mills.

Cotton batting and cotton waste processes.

Cotton dressmaking.

Dry cleaning establishments using or storing more than three (3) gallons of gasoline or other hazardous liquids with a flash point under seventy-five (75) degrees F., or more than sixty (60) gallons of volatile flammable liquids with flash point between seventy-five (75) and one hundred and forty (140) degrees F., in a closed-up tester.

Feather renovating.

Fruit ripening processes.

Grain elevators.

Hydrogenation processes.

Industries employing solids or substances which ignite or produce flammable gases on contact with water.

Kerosene, fuel, lubricating, or any oil storage with a flash point under two hundred (200) degrees F.

Match manufacture or storage.

Metal enameling or japanning.

Nitro-cellulose film exchanges and laboratories.

Paint and varnish manufacture.

Paint spraying or dipping, except as specified in sections 213.2 and 302.3.

Petroleum manufacture.

Processing of paper or cardboard in loose form.

Pyroxylin products manufacture and storage.

Rag sorting and storage.

Refrigerating systems using high hazard refrigerants as defined in article 18.

Shoddy mills.

Shoe polish manufacture.

Smoke houses (industrial).

Straw goods manufacture or broom corn storage.

Sugar and starch pulverizing mills.

Tar, pitch or resin processing.

Tanneries with enameling or japanning.

Waste paper sorting, shredding, storage or bailing.

SECTION 204.0 USE GROUP B, STORAGE BUILDINGS

All buildings and structures or parts thereof shall be classified in the storage use group which are used primarily for the storage of goods, wares or merchandise, except those that involve highly combustible or explosive products or materials; including among others, warehouses, storehouses and freight depots.

204.1 LIST OF MODERATE HAZARD USES: Buildings used for storage of moderate hazard contents which are likely to burn with moderate rapidity but which do not produce either poisonous gases, fumes or explosives, including among others the materials listed in table 2-2, shall be classified in the group B-1 storage use group.

TABLE 2-2 - USE GROUP B-1, STORAGE USES - MODERATE HAZARD

Bags, cloth, burlap and paper
Bamboo and rattan
Baskets
Belting, canvas and leather
Books and paper in rolls or packs
Boots and shoes
Button, including cloth-covered, pearl or bone
Linoleum
Livestock shelters
Lumber yards
Motor vehicle repair shops
Petroleum warehouses for storage of lubricating oils with a flash point of three hundred (300) degrees F. or higher (See section 905.3).

Cardboard and cardboard boxes
Clothing, woolen wearing apparel
Cordage
Furniture
Furs
Glue, mucilage, paste and size
Horn and combs, other than celluloid
Leather enameling or japanning
Photo-engraving
Public garages and stables
Silk
Soap
Sugar
Tobacco, cigars, cigarettes and snuff
Upholstering and mattress manufacturing
Wax candles

204.2 LIST OF LOW HAZARD USES: Buildings used for the storage of noncombustible materials, and of low hazard wares that do not ordinarily burn rapidly, shall be classified in the B-2 storage use group unless herein otherwise classified, including among others the materials listed in table 2-3.

TABLE 2-3 - USE GROUP B-2, STORAGE USES - LOW HAZARD

Asbestos
Chalk and crayons
Food products
Glass
Ivory
Metals
Porcelain and pottery
Talc and soapstones

SECTION 205.0 USE GROUP C, MERCANTILE BUILDINGS

All buildings and structures or parts thereof shall be classified in the mercantile use group which are used for display and sales purposes involving stocks of goods, wares or merchandise incidental to such purposes and accessible to the public; including among others retail stores, shops and salesrooms and markets. Highly combustible materials shall be limited to small quantities that do not constitute a high hazard. Where the hazard of the contents is greater than the normal fire hazard for such use, the building official may require an evaluation by a qualified registered professional engineer or architect and based on such evaluation the building commissioner or inspector of buildings may require compliance with the requirements of high hazard use groups as established by the provisions of article 4 and tables 2-5 and 2-6.

SECTION 206.0 USE GROUP D, INDUSTRIAL BUILDINGS

All buildings and structures or parts thereof in which occupants are engaged in performing work or labor in fabricating, assembling or processing of products or materials shall be classified in the industrial use group; including among other factories, assembling plants, industrial laboratories and all other industrial and manufacturing uses, except those involving highly combustible, flammable or explosive products and materials of the high hazard use group (use group A).

206.1 LIST OF INDUSTRIAL USES: The processes and manufacturers listed in table 2-4 shall be indicative of and include the uses permitted in use group D buildings.

TABLE 2-4 - USE GROUP D, INDUSTRIAL USES

Bakeries
Boiler works
Breweries
Canneries, including food products
Condensed and powdered milk manufacture
Dry cleaning using other than volatile flammable liquids in cleaning or dyeing operations or other than classified in table 1
Electric light plants and power houses
Electrolytic reducing works
Glass plants
Ice plants
Leather and tanneries, excluding enameling or japanning
Millwork and woodworking
Sugar refineries
Tenant factories, excluding ladies' dresses and other high hazard uses.
Textile mills, including canvas, cotton cloth, bagging, burlap, carpets and rags
Upholstery and manufacturing shops
Water-pumping plants

206.2 SPECIAL INDUSTRIAL USES: All buildings and structures designed to house low hazard industrial processes, including among others the production and distribution of electric, gas or steam power and rolling mills and foundries, requiring large areas and unusual heights to accommodate craneways or special machinery and equipment shall be exempt from the height and area limitations of table 2-6.

206.21 CONSTRUCTION: Buildings and structures for such low hazard industrial uses shall comply with the requirements of section 309.0 except as to height and when constructed of noncombustible (type 2-C) construction may have balconies and mezzanine floors which do not exceed two-thirds (2/3) the area of the main floor in any one tier.

206.22 ENCLOSURE WALLS: The enclosure walls of buildings of such low hazard industrial uses shall be constructed of approved noncombustible and weather resisting materials and when located with a fire separation of less than thirty (30) feet from interior lot lines of any other building shall be protected or constructed to provide a fireresistance rating of not less than two (2) hours.

206.23 FIREFIGHTING AND EXTINGUISHING EQUIPMENT: Special use industrial buildings as herein defined shall comply with the requirements of article 12 for auxiliary fire extinguishing equipment; except that the provisions of section 309.0 for automatic sprinkler equipment in unlimited area buildings may be waived by the building official when such installations would be detrimental or dangerous to the specific use and occupancy.

SECTION 207.0 USE GROUP E, BUSINESS BUILDINGS

All buildings and structures or parts thereof shall be classified in the business use group which are used for the transaction of business, for the rendering of professional services or for other services that involve stocks of goods, wages or merchandise in limited quantities for use incidental to office uses or sample purposes; including among others offices, banks, civic administration activities, professional

services, testing and research laboratories, radio stations, telephone exchanges and other similar establishments.

SECTION 208.0 USE GROUP F, ASSEMBLY BUILDINGS

All buildings and structures or parts thereof shall be classified in the assembly use group which are used or designed for places of assembly as defined in the Basic Code.

208.1 USE GROUP F-1 - THEATRES.

208.11 USE GROUP F-1-A STRUCTURES shall include all theatres and other buildings used primarily for theatrical or operatic performances and exhibitions, arranged with a raised stage, proscenium curtain, fixed or portable scenery or scenery loft, motion picture booth, mechanical appliances or other theatrical accessories and equipment and provided with fixed seats.

208.12 USE GROUP F-1-B STRUCTURES shall include all theatres without a stage and equipped with fixed seats used for motion picture performances.

208.2 USE GROUP F-2 STRUCTURES shall include all buildings and places at public assembly, without theatrical stage accessories, designed for use as dance halls, night clubs and for similar purposes including all rooms, lobbies and other spaces connected thereto with a common means of egress and entrance.

208.3 USE GROUP F-3 STRUCTURES shall include all buildings with or without an auditorium in which persons assemble for amusement, entertainment or recreation, and incidental motion picture, dramatic, theatrical or educational presentations, lectures, or other similar purposes, without theatrical stage other than a raised platform; and principally used without permanent seating facilities, including art galleries, exhibition halls, museums, lecture halls, libraries, restaurants other than night clubs, and recreation centers; and buildings designed for other similar assembly purposes including passenger terminals.

208.4 USE GROUP F-4 STRUCTURES shall include all buildings used as churches and for similar religious purposes. Also included are buildings used for low density recreation such as swimming pools, tennis and skating and where there is accommodations of less than 100 spectators.

208.5 USE GROUP F-5 STRUCTURES shall include grandstands, bleachers, coliseums, stadiums, drive-in theatres, tents and similar structures for outdoor assembly use and shall comply with the provisions of the Basic Code for special uses and occupancies. (see article 4).

208.6 USE GROUP F-6 STRUCTURES shall include those buildings, structures, premises and parts thereof in which a regular course of public or private instruction is given to not less than ten (10) individuals at one time. Schools or rooms used for religious instruction which are

under the jurisdiction or administration of a church or other defined religious body are regulated under Use Group F-4. All buildings, structures, premises and parts thereof which are classified under Use Group F-6 occupancy shall be subject to the provision of Reference Standard F-6, Building Regulations for Schoolhouses, of the State Building Code Commission.

208.7 USE GROUP F-7 STRUCTURES shall include those buildings, structures, premises and parts thereof which are used to provide a place to assemble individuals for any use covered by Use Group F, but which accommodate more than twenty (20) but less than 50 people. Use Group F-7 structures shall be classified the same as Use Group E.

SECTION 209.0 USE GROUP H, INSTITUTIONAL BUILDINGS

All buildings and structures or parts thereof shall be classified in the institutional use group in which people suffering from physical limitations because of health or age are harbored for medical or other care or treatment, or in which people are detained for penal or correctional purposes, or in which the liberty of the inmates is restricted.

209.1 USE GROUP H-1 shall include all buildings designed for the detention of people under restraint including among others jails, prisons, reformatories, insane asylums and similar uses.

209.2 USE GROUP H-2 shall include all buildings used for housing people suffering from physical limitations because of health or age, including among others day nurseries, hospitals, sanitariums, clinics, infirmaries, orphanages, homes for aged and infirm; and buildings designed for prosecuting public or civic services and activities of emergency character, including among others fire houses, police stations and similar uses.

SECTION 210.0 USE GROUP L, RESIDENTIAL BUILDINGS

All buildings and structures or parts thereof shall be classified in the residential use group, in which families or households live or in which sleeping accommodations are provided for individuals with or without dining facilities, excluding those that are classified as institutional buildings.

210.1 USE GROUP L-1: Use Group L-1 shall include buildings and spaces that are primarily occupied for the shelter and sleeping accommodation of individuals on a day-to-day or week-to-week basis. Such occupancies shall include hotels, lodging houses, boarding houses and similar occupancies.

210.2 USE GROUP L-2: Use Group L-2 shall include buildings with three or more dwelling units and other uses intended for living and sleeping accomodations of families or individuals on a long-term basis, and which shall include all multiple family dwellings, apartment houses, and dormitories.

210.3 USE GROUP L-3: Use Group L-3 shall include buildings occupied as one and two-family dwellings. Such buildings shall also include semi-detached houses which are vertically separated by fire divisions of the required use group fire grading, and have separate means of egress directly to the outside which are independent of any other dwelling unit.

Mobile homes are defined and controlled under the provisions of article 19.

SECTION 211.0 USE GROUP M, MISCELLANEOUS USES

Structures and buildings of a temporary character and miscellaneous structures not classified in any specific use group shall be constructed, equipped and maintained to meet the requirements of the Basic Code commensurate with the fire and life hazard incidental to their use. Miscellaneous uses shall include all accessory buildings and structures used as private garages, sheds, fences and similar purposes.

SECTION 212.0 DOUBTFUL USE CLASSIFICATION

When a building or structure is proposed for a use not specifically provided for in the Basic Code or the classification of which is doubtful, such building or structure shall be included in the use group which it most nearly resembles in respect to the existing or proposed life and fire hazard and it shall be so classified by the building official.

SECTION 213.0 MIXED USE AND OCCUPANCY

213.1 TWO OR MORE USES: When a building is occupied for two (2) or more uses not included in the same use group, one of the following shall apply:

a) The provisions of the code applying to each use shall apply to such parts of the building as come within that use group; and if there are conflicting provisions, the requirements securing the greater public safety shall apply to the entire building, or

b) The mixed uses shall be completely separated both horizontally and vertically by fire separation walls and floor-ceiling assemblies having a fireresistance rating corresponding to the highest fire grading prescribed in table 9-1 for the separate uses. Each part of the building shall be separately classified

as to use. The most restrictive height and area limitations in this Code for the mixed uses shall apply to the entire building, or except as otherwise provided for in this Code, or

c) The mixed uses shall be completely separated by fire walls having a fireresistance rating corresponding to the highest fire grading prescribed in table 9-1 for the separate uses. Each group shall then comply with the provisions of this Code applicable to that group.

213.2 INCIDENTAL USES: Where the higher hazard use is supplemental to the main use of the building and the area devoted to such use is constructed and segregated by fireresistive construction as required in article 4, the building shall be classified according to the main use.

213.3 FIRE DIVISIONS: When mixed uses are completely separated horizontally and vertically from adjoining occupancies by fire divisions of the highest fire grading prescribed in table 9-1 for the separated uses, each part of the building shall be separately classified as to use.

SECTION 214.0 CONSTRUCTION CLASSIFICATION

All buildings, structures, rooms or spaces hereafter altered or erected shall for the purposes of this Code be classified in one (1) or a combination of the four (4) construction types herein defined: Type 1, Fireproof Construction; Type 2, Noncombustible Construction; Type 3, Exterior Masonry Wall Construction; and Type 4, Frame Construction.

214.1 FALSE DESIGNATION: No building or space shall be designated a given type of construction unless it conforms to the minimum requirements for that type; and it shall be unlawful to post, or use, or designate, or advertise a building as of a given type of construction unless it complies with the minimum code requirements for that type.

214.2 MINIMUM REQUIREMENTS: When a superior type of construction is used than the minimum herein required for any specified use, height and area of the building, nothing in the Basic Code shall be construed to require full compliance with the specifications for the higher type; but the designated construction classification of the building shall be that of the lesser requirement, unless all the requirements for the higher type are fulfilled.

214.3 MIXED CONSTRUCTION: When two or more types of construction occur within the same structure which is occupied for only one use group classification, then any of the types of construction must be able to satisfy the requirements for the use group. If there is more than one use occupancy of the structure, then the construction must be able to satisfy the provisions of section 213.1.

SECTION 215.0 TYPE 1, FIREPROOF CONSTRUCTION

Buildings and structures of fireproof construction are those in which the walls, partitions, structural elements, floors, ceilings, and roofs, and the exitways are constructed and protected with approved noncombustible materials to afford the fireresistance specified in table 2-5; except as otherwise specifically regulated by the provisions of article 9. Fireproof buildings shall be further classified as types 1-A and 1-B.

Fire-retardant treated wood may be used as specified in table 2-5 and section 903.8.

SECTION 216.0 TYPE 2, NONCOMBUSTIBLE CONSTRUCTION

Buildings and structures of noncombustible construction are those in which the walls, partitions, structural elements, floors, ceilings, and roofs, and the exitways are constructed of approved noncombustible materials meeting the fireresistive requirements specified in table 2-5, and as further regulated in article 9. Noncombustible buildings shall be further classified as types 2-A, 2-B, and 2-C.

Fire-retardant treated wood may be used as specified in table 2-5 and section 903.8.

SECTION 217.0 TYPE 3, EXTERIOR MASONRY WALL CONSTRUCTION

Buildings and structures of exterior masonry wall construction are those in which the exterior, fire and party walls are constructed of masonry or other approved noncombustible materials, of the required fireresistance and structural properties; and the floors, roofs, and interior framing are wholly or partly of wood or of metal or other approved construction; the fire and party walls are ground supported; except that girders and their supports carrying walls of masonry shall be protected to afford the same degree of fireresistance of the walls supported thereon; and all structural elements have the required fire-resistance rating specified in table 2-5.

217.1 TYPE 3A: Buildings and structures of heavy timber construction are those in which fire resistance is attained by placing limitations on the minimum sizes of wood structural members and on minimum thickness and composition of wood floors and roofs; by the avoidance, or by the proper protection by firestopping or other acceptable means, of concealed spaces under floors and roofs; by the use of approved fastenings, construction details, and adhesives for structural members; and by providing the required degree of fire resistance in exterior and interior walls. (See section 852.0 for construction details.)

COLUMNS: Wood columns may be sawn or glued laminated and shall be not less than eight (8) inches, nominal, in any dimension when supporting floor loads and not less than six (6) inches, nominal, in width and not less than eight (8) inches, nominal, in depth when supporting roof and ceiling loads only.

FLOOR FRAMING: Beams and girders of wood may be sawn or glued laminated and shall be not less than six (6) inches, nominal, in width and not less than ten (10) inches, nominal, in depth. Framed or glued laminated arches which spring from the floor line and support floor loads shall be not less than eight (8) inches, nominal, in any dimension. Framed timber trusses supporting floor loads shall have members of not less than eight (8) inches, nominal, in any dimension.

ROOF FRAMING: Framed or glued laminated arches for roof construction which spring from the floor line or from grade and do not support floor loads shall have members not less than six (6) inches, nominal, in width and not less than eight (8) inches, nominal, in depth for the lower half of the height and not less than six (6) inches, nominal, in depth for the upper half. Framed or glued laminated arches for roof construction which spring from the top of walls or wall abutments, framed timber trusses, and other roof framing which do not support floor loads, shall have members not less than four (4) inches, nominal, in width and not less than six (6) inches, nominal, in depth. Spaced members may be composed of two (2) or more pieces not less than three (3) inches, nominal, in thickness when blocked solidly throughout their intervening spaces or when such spaces are tightly closed by a continuous wood cover plate of not less than two (2) inches, nominal in thickness, secured to the underside of the members. Splice plates shall be no less than three (3) inches, nominal in thickness. When protected by approved automatic sprinklers under the roof deck, framing members shall be not less than three (3) inches, nominal, in width.

FLOORING: Floors shall be without concealed spaces and shall be of sawn or glued laminated plank, splined, or tongue-and-groove, of not less than three (3) inches, nominal, in thickness covered with one (1) inch, nominal, dimension tongue-and-groove flooring, laid crosswise or diagonally, or one-half (½) inch plywood, or one-half (½) inch particle board; or of planks not less than four (4) inches, nominal, in width, set on edge close together and well spiked, and covered with one (1) inch, nominal, dimension flooring, or one-half (½) inch plywood, or one-half (½) inch particle board.

ROOF DECKING: Roofs shall be without concealed spaces and roof decks shall be sawn or glued laminated, splined or tongue-and-groove plank, not less than two (2) inches, nominal, in thickness, one and one-eighth (1-1/8) inches thick interior plywood (exterior glue), or of planks not less than three (3) inches, nominal, in width, set on edge close together and laid as required for floors. Other types of decking may be used if providing equivalent fireresistance and structural properties.

BEARING WALLS: Bearing portions of exterior and interior walls shall be of approved noncombustible material and shall have a fireresistance rating of not less than two (2) hours.

NON-BEARING WALLS: Nonbearing portions of exterior walls shall be of approved noncombustible materials except as otherwise noted and; where a horizontal separation of less than twenty (20) feet is provided, nonbearing exterior walls shall have a fireresistance rating of not less than two (2) hours. Where a horizontal separation of twenty (20) feet to thirty (30) feet is provided, nonbearing exterior walls shall have a fireresistance rating of not less than one (1) hour. Where a horizontal separation of thirty (30) feet or more is provided, no fireresistance rating is required. Where a horizontal separation of twenty (20) feet or more is provided, wood columns and arches conforming to heavy timber sizes may be used externally.

217.2 TYPE 3-B: Structures of type 3-B (ordinary protected) shall include all exterior masonry wall buildings in which the interior structural elements are wholly or partly of fire-protected wood of not less than two (2) inch nominal thickness, or of other approved protected combustible materials, or of metal protected and insulated to afford three-quarter (3/4) hour fireresistance rating where specified in table 2-5.

217.3 TYPE 3-C: Structures of type 3-C (ordinary unprotected) construction shall include all exterior masonry wall buildings in which the interior structural members are of wood of not less than two (2) inch nominal thickness or consist of other combustible or noncombustible materials with protection of less than three-quarter (3/4) hour fireresistance rating.

SECTION 218.0 TYPE 4, FRAME CONSTRUCTION

Buildings and structures of frame construction are those in which the exterior walls, bearing walls, partitions, floor and roof construction are constructed wholly or partly of wood stud and joist assemblies with a minimum nominal dimension of two (2) inches, or of other approved combustible materials; with firestopping at all vertical and horizontal draft openings as regulated in section 874.0, and in which the structural elements have the required fireresistance ratings specified in table 2-5. Frame buildings shall be further classified as types 4-A and 4-B.

TABLE 2-5. FIRE RESISTANCE RATINGS OF STRUCTURAL ELEMENTS IN HOURS

TYPE OF CONSTRUCTION

	Notes on Page 2-33 STRUCTURAL ELEMENT		TYPE 1		TYPE 2 NONCOMBUSTIBLE Note b			TYPE 3 EXTERIOR MASONRY WALLS			TYPE 4 FRAME	
			FIREPROOF		PROTECTED		Unprotected	Heavy Timbers (Mill)	Ordinary Protected	Ordinary Unprotected	Protected	Unprotected
	EXTERIOR WALLS	Note a	1A	1B	2A	2B	2C	3A	3B	3C	4A	4B
1	On street lot lines or with fire separation of 30' or more from interior lot lines or any building	Bearing	4	3	2	3/4	0	2	2	2	3/4	0
		Non-Bearing	0	0	0	0	0	0	0	0	3/4	0
	On interior lot lines or less than 6' therefrom, or from any building	Bearing	4	3	2	1 1/2	Note c 3/4	2	2	2	3/4	3/4
		Non-Bearing	2	2	1 1/2	3/4	Note c 3/4	2	2	2	3/4	3/4
	6' or more but Less than 11'	Bearing	4	3	2	3/4	0	2	2	2	3/4	0
		Non-Bearing	2	2	1 1/2	3/4	0	2	2	2	3/4	0
	11' or more but Less than 30'	Bearing	4	3	2	3/4	0	2	2	2	3/4	0
		Non-bearing	1 1/2	1 1/2	3/4	3/4	0	See Sec217	1 1/2	1 1/2	3/4	0
2	Interior bearing walls and partitions		4	3	2	3/4	0	2	3/4	0	3/4	0
			← Noncombustible →									
3	Fire walls		4	3	2	2	2	2	2	2	2	Note d 2
			← In No Case less than Fire Grading of Use Group (See Table 16) →									
4	Fire Divisions		← Fire Resistance Rating corresponding to Fire Grading of Use Group (See Table 16) →									
5	Fire Enclosure of Exitways, Elevator Hoistways, Exitway Hallways and Stairways Note e		2	2	2	2	2	2	2	2	3/4	3/4
			← Noncombustible →									
6	Shafts other than Stairways		2	2	2	2	2	2	2	2	3/4	3/4
			← Noncombustible →									
7	Exitway Access Hallways & Vertical Separation of Tenant Spaces		3/4	3/4	3/4	3/4	0	3/4	3/4	0	3/4	0
			← Noncombustible → Note h									
	Other Non-bearing Partitions (See Art. 9)		← Noncombustible → Note h					0	0	0	0	0
8	Columns, Girders, Trusses (other than roof trusses) and Framing	Supporting one Floor or Roof	3	2	1 1/2	3/4	0	See Sec217	3/4	0	3/4	0
		Supporting more than One Floor	4	3	2	3/4	0	See Sec217	3/4	0	3/4	0
9	Structural Members Supporting Wall		← Required Fire Resistance of Wall Supported but not less than Fire Resistance Rating for Type of Construction →									
10	Floor Construction including Beams Note g		3	2	1 1/2	3/4	0	See Sec217	3/4	0	3/4	0
11	Roof Construction including Beams 15' or Less in Height Note g		2	1 1/2	3/4	3/4	0	See Sec217	3/4	0	3/4	0
					← Note h →							
12	Roof Trusses and Framing including Arches & Roof Deck Note f	More than 15' but less than 20' in height to lowest member	3/4	3/4	3/4	0	0	See Sec217	0	0	3/4	0
			← Note h →									
		20' or more in height to lowest member	0	0	0	0	0	See Sec217	0	0	0	0
			← Note h →									

NOTES APPLICABLE TO TABLE 2-5

GENERAL

For special high hazard uses involving a higher degree of fire severity and higher concentration of combustible contents, the fire-resistance requirements for structural elements shall be increased accordingly. (See section 400).

SPECIFIC

Note a The fire separation or fire exposure in feet as herein limited applies to the distance from other buildings on the site, or from an interior lot line or from the opposite side of a street or other public space not less than thirty (30) feet wide to the building wall. (See Definitions, section 901).

Note b Protected exteriors shall be required within the fire limits in type 2 construction as follows: high hazard uses, 2-hour fire-resistance with fire separation up to eleven (11) feet.

Note c One-story buildings of type 2-C construction which do not exceed three thousand (3000) square feet in area in all use groups except high hazard assembly and institutional shall be exempt from the protected exterior wall requirements of table 2-5. (See section 302.4.)

Note d Party walls in type 4 buildings shall be as follows: one and two-family dwellings, three-quarter (3/4) hour fire resistance. (See section 907.3) Other uses two (2) hours, but not less than the fire grading of the use group (See table 9-1).

Note e Stair enclosures in all buildings, other than one and two-family dwellings, which do not exceed three (3) stories or forty (40) feet in height with an occupancy load of less than forty (40) below and less than seventy-five (75) above the grade floor shall be of not less than three-quarter (3/4) hour fireresistance. In buildings of types 3 or 4 construction, such three-quarter (3/4) hour enclosures may be of combustible construction as provided in section 618.92.

Note f In all buildings in which the roof framing may be unprotected, roof slabs and decking may be noncombustible without fire resistance rating except that in buildings not more than five (5) stories in height, roof decking may be of mill type construction or of any other materials providing equivalent fireresistant and structural properties. (See sections 217 and 915.)

Note g In Type 3A construction members which are of material other than heavy timber shall have a fireresistance rating of not less than 3/4 hour.

Note h Fire-Retardant Treated Wood, complying with section 903.72, may be used as provided in section 903.8.

TABLE 2 - 6. HEIGHT LIMITATIONS (UPPER FIGURE : STORIES AND FEET ABOVE GRADE) AND AREA LIMITATIONS (LOWER FIGURE : AREA IN SQUARE FEET PER FLOOR) OF ONE-STORY BUILDINGS FACING ON ONE STREET OR PUBLIC SPACE NOT LESS THAN 30 FEET WIDE

N.P. - NOT PERMITTED
UNLIMITED

TYPE OF CONSTRUCTION

Notes on Page 2-35 USE GROUP			TYPE 1 Fireproof Note b		TYPE 2 Noncombustible			TYPE 3 Exterior Masonry Walls			TYPE 4 Frame	
					Protected		Un-protected	(HT) Mill	Ordinary Joisted Protected	Ordinary Joisted Un-protected	Protected	Un-protected
			1A	1B	2A	2B	2C	3A	3B	3C	4A	4B
A	HIGH HAZARD	Notes f and j.	5 ST 65' 16,800	3 ST 40' 14,400	3 ST 40' 11,400	2 ST 30' 7,500	1 ST 20' 4,800	2 ST 30' 7,200	2 ST 30' 6,600	1 ST 20' 4,800	1 ST 20' 5,100	N.P.
B-1	STORAGE-Moderate	Notes a, c, d, g and h.			5 ST 65' 19,950	4 ST 50' 13,125	2 ST 30' 8,400	4 ST 50' 12,600	3 ST 40' 11,550	2 ST 30' 8,400	2 ST 30' 8,925	1 ST 20' 4,200
B-2	STORAGE-Low	Notes a, c and d.			7 ST 85' 34,200	5 ST 65' 22,500	3 ST 40' 14,400	5 ST 65' 21,600	4 ST 50' 19,800	3 ST 40' 14,400	3 ST 40' 15,300	2 ST 30' 7,200
C	MERCANTILE	Notes a, c and d.			6 ST 75' 22,800	4 ST 50' 15,000	2 ST 30' 9,600	4 ST 50' 14,400	3 ST 40' 13,200	2 ST 30' 9,600	2 ST 30' 10,200	1 ST 20' 4,800
D	INDUSTRIAL	Notes a, c and d.			6 ST 75' 22,800	4 ST 50' 15,00	2 ST 30' 9,600	4 ST 50' 14,400	3 ST 40' 13,200	2 ST 30' 9,600	2 ST 30' 10,200	1 ST 20' 4,800
E	BUSINESS	Notes a, c and d.			7 ST 85' 34,200	5 ST 65' 22,500	3 ST 40' 14,400	5 ST 65' 21,600	4 ST 50' 19,800	3 ST 40' 14,400	3 ST 40' 15,300	2 ST 30' 7,200
F-1-A	ASSEMBLY THEATRES	With stage and scenery		6 ST 75' 14,400	4 ST 50' 11,400	2 ST 30' 7,500	1 ST 20' 4,800	2 ST 30' 7,200	2 ST 30' 6,600	1 ST 20' 4,800	1 ST 20' 5,100	N.P.
F-1-B	ASSEMBLY THEATRES	Without stage (Movie theatres)			5 ST 65' 19,950	3 ST 40' 13,125	2 ST 30' 8,400	3 ST 40' 12,600	3 ST 40' 11,550	2 ST 30' 8,400	1 ST 20' 8,925	1 ST 20' 4,200
F-2	ASSEMBLY - Night clubs and similar uses			4 ST 50' 7,200	3 ST 40' 5,700	2 ST 30' 3,750	1 ST 20' 2,400	2 ST 30' 3,600	2 ST 30' 3,300	1 ST 20' 2,400	1 ST 20' 2,550	1 ST 20' 1,200
F-3	ASSEMBLY - Lecture halls, recreation centers, terminals, restraurants Note c.				5 ST 65' 19,950	3 ST 40' 13,125	2 ST 30' 8,400	3 ST 40' 12,600	3 ST 40' 11,550	2 ST 30' 8,400	1 ST 20' 8,925	1 ST 20' 4,200
F-4	ASSEMBLY - Churches, schools Notes k and l.				5 ST 65' 34,200	3 ST 40' 22,500	2 ST 30' 14,400	3 ST 40' 21,600 Note e	3 ST 40' 19,800	2 ST 30' 14,400	1 ST 20' 15,300 Note e	1 ST 20' 7,200 Note e
H-1	INSTITUTIONAL - Restrained			6 ST 75' 18,800	4 ST 50' 14,250	2 ST 30' 9,375	1 ST 20' 6,000	2 ST 30' 9,000	2 ST 30' 8,250	1 ST 20' 6,000	1 ST 20' 6,375	N. P.
H-2	INSTITUTIONAL - Incapacitated			8 ST 90' 21,600	4 ST 50' 17,100	2 ST 30' 11,250	1 ST 20' 7,200	2 ST 30' 10,800	2 ST 30' 9,900	1 ST 20' 7,200	1 ST 20' 7,650	N. P.
L-1	RESIDENTIAL - Hotels				9 ST 100' 22,800	4 ST 50' 15,000	3 ST 40' 9,600	4 ST 50' 14,400	4 ST 50' 13,200	3 ST 40' 9,600	3 ST 40' 10,200	2 ST 35' 4,800
L-2	RESIDENTIAL - Multi-family				9 ST 100' 22,800	4 ST 50' 15,000	3 ST 40' 9,600	4 ST 50' 14,400	4 ST 50' 13,200	3 ST 40' 9,600	3 ST 40' 10,200	2 ST 35' 4,800
L-3	RESIDENTIAL - 1 & 2 family				4 ST 50' 22,800	4 ST 50' 15,000	3 ST 40' 9,600	4 ST 50' 14,400	4 ST 50' 13,200	3 ST 40' 9,600	3 ST 40' 10,200	2 ST 35' 4,800
M	MISCELLANEOUS & TEMPORARY											

NOTES TO TABLE 2-6

GENERAL

For all buildings which have more than twenty-five (25) percent of the building perimeter fronting on a street or other unoccupied space which is at least thirty (30) feet wide and has unrestricted accessibility for fire equipment and apparatus, the tabular area may be increased by two (2) percent for each one (1) percent of such perimeter excess above the twenty-five (25) percent.

Example: Perimeter = 400 feet
Accessible Perimeter = 300 feet

1. 25% of 400 feet = 100 feet
2. Excess of accessible perimeter
   accessible perimeter = 300 feet
   25% deduction = 100 feet
   Excess of accessible perimeter = 200 feet
3. Percentage of excess = $\frac{200 \times 100\%}{400}$ = 50%
4. Increase allowable = 2 x 50% = 100%

A one-hundred (100) percent increase in the tabular area as allowed, thus doubling the allowable area.

SPECIFIC

Note a In use groups B-1, B-2, C, D, E and F-4, the tabular areas may be increased two hundred (200) percent for one (1) story buildings and one hundred (100) percent for buildings over one (1) story in height when such buildings are equipped with automatic sprinkler systems not specifically required by law. (See section 308).

Note b Type 1 buildings permitted unlimited tabular heights and areas are not subject to special requirements that allow increased heights and areas for other types of construction.

Note c In use groups B, C, D, E and F-3, isolated buildings of other than frame construction may be of unlimited areas outside of the fire limits when not more than one (1) story or eighty-five (85) feet in height when complying with specific provisions of the Basic Code. (See section 309).

Note d In use groups B-1, B-2, C, D and E types 1, 2 and 3 construction may be increased one (1) story but not more than twenty (20) additional feet in height when equipped with automatic sprinkler systems not specifically required by law. (See section 310.2).

Note e Church auditoriums of type 3-A construction may be erected to sixty-five (65) feet in height, and of type 4 construction to forty-five (45) feet in height.

Note f For exceptions to height and area limitations of high hazard use buildings, see article 4 governing the specific use. For

other special fireresistive requirements governing specific uses, see section 905.

Note g For height and area exceptions covering public parking decks, see section 905.2.

Note h For height and area exceptions covering petroleum bulk-storage buildings, see section 905.3.

Note i For exceptions to height of multi-family dwellings of types 2-B and 3-B construction, see section 905.6

Note j For one-story combustible fibre warehouses, see section 408.3.

Note k The tabular area of one-story school buildings of use group F-4 may be increased two hundred (200) percent provided every classroom has at least one door opening directly to the exterior of the building. Not less than one-half (½) of the required exitways from any assembly room included in such buildings shall also open directly to the exterior of the building.

Note l For exception to area limitations for one-story buildings of type 2, 3-A and 3-B construction, see section 309.11.

ARTICLE 3

GENERAL BUILDING LIMITATIONS

SECTION 300.0 SCOPE

The provisions of this article shall control the division of the municipalities of the Commonwealth of Massachusetts into fire districts and the general limitations of height and area of all buildings hereafter erected, and extensions to existing buildings hereafter altered or enlarged as affected by the fire and life hazard incident to type of construction, use group, density of development, exterior exposure and accessibility of buildings and structures to fire-fighting facilities and equipment.

SECTION 301.0 FIRE DISTRICT SUBDIVISIONS

For the purpose of control of use and construction of buildings, the building official shall establish limiting districts designated Fire District No. 1, Fire District No. 2 and Outside Fire Limits under the legal procedure of the municipalities of the Commonwealth of Massachusetts for creating and establishing fire districts.

NOTE A: NUMBER OF FIRE DISTRICTS. - The number of fire districts to be established will depend upon the prevailing character of construction and typical development of the specific locality. In large cities, two (2) fire districts are generally desirable while in cities of moderate size and in small political subdivisions, one fire district may be adequate to provide for the fire hazard inherent in concentrated commercial and manufacturing occupancies. The fire district should include all those areas of the municipality in which buildings of business, mercantile, industrial, storage and other use groups of similar fire and conflagration hazard are concentrated. If provision is made for only one fire district, the restrictions herein prescribed for Fire District No. 1 will be applicable to such district.

301.1 FIRE DISTRICT NO. 1: Fire District No. 1 shall comprise the areas housing highly congested business, commercial, manufacturing and industrial uses or in which such uses are developing.

301.2 FIRE DISTRICT NO. 2: Fire District No. 2 shall comprise the areas housing residential uses (use groups L-1 and L-2), together with retail stores, business and amusement centers, or in which such uses are developing.

301.3 OUTSIDE FIRE LIMITS: All other areas not included in Fire District Nos. 1 and 2 shall be designated as Outside Fire Limits.

SECTION 302.0 GENERAL FIRE DISTRICT PROVISIONS

302.1 CHANGES IN DISTRICTS: Any changes in the boundaries of fire districts or changes of designation of any area from one fire district to another fire district shall be established by the local municipality.

302.2 OVERLAPPING DISTRICTS: A building or structure located in more than one fire district shall be deemed to be in that one of the three districts which contains the major part of the building area; and in the event of equal distribution in two or more districts, the limitations of the most restricted district shall apply.

302.3 HIGH HAZARD USES: Except as specifically approved by the municipal authorities, all buildings of high hazard use (use group A) shall be prohibited from location in Fire District No. 1. Paint spray, drying rooms and rooms for similar incidental uses not exceeding one thousand (1000) square feet in area in industrial buildings shall be permitted when enclosed in fireresistive construction as specified in article 4 for special uses and occupancies and when segregated by fire divisions of the required fireresistance specified in table 9-1.

302.31 PROTECTED EXTERIORS: All buildings of type 2 construction for high hazard uses (use group A) within the fire districts shall be constructed with walls of two (2) hours fireresistance when located within eleven (11) feet of interior lot lines or any buildings on the same lot.

302.4 NONCOMBUSTIBLE CONSTRUCTION EXEMPTIONS: One (1) story buildings of type 2-C construction which do not exceed three thousand (3000) square feet in area in all use groups except high hazard, assembly and institutional shall be exempt from all protected exterior wall requirements.

302.5 FRAME CONSTRUCTION: No building of frame construction (type 4) shall be erected within the fire districts nor shall such building or structure be moved from without to within, or from one lot to another with the fire districts, except as provided in sections 303 and 304; and no building of otherwise lawful construction shall be extended in height or area within the fire districts by frame construction; except that one-and two-family frame dwellings may be extended in area by not more than three hundred (300) square feet and to a height of not more than two and one-half (2½) stories nor more than thirty-five (35) feet.

302.6 ROOF COVERINGS: All roof coverings shall be constructed of Class A, Class B or Class C roofings, complying with the provisions of article 9.

SECTION 303.0 RESTRICTIONS OF FIRE DISTRICT NO. 1

All buildings and structures, and all additions to existing buildings and structures, hereafter erected within the boundaries of Fire

District No. 1 shall be of fireproof (type 1), protected noncombustible (types 2-A and 2-B), heavy timber (type 3-A), or ordinary protected (type 3-B) construction as defined in article 2 and regulated in table 2-5; and shall be constructed within the height and area limitations of table 2-6; except as herein provided.

Open parking structures may be constructed as permitted under section 905.2.

303.1 FENCES: Fences not over six (6) feet in height may be erected of frame (type 4) construction.

303.2 STORM ENCLOSURES: Storm enclosures may be erected of frame construction not more than ten (10) feet in height and not more than three (3) feet wider than the entrance doors which they serve, provided they do not project more than six (6) feet beyond the building line.

303.3 ACCESSORY BUILDINGS

303.31 OUTBUILDINGS AND PARKING LOT OFFICES: Outbuildings and parking lot offices not more than ten (10) feet in height and one hundred (100) square feet in area may be erected of frame (type 4) construction when accessory to one- or two-family dwelling on the same lot or accessory to a lot approved for motor vehicle parking, when located not less than six (6) feet from the lot line or any other building.

303.32 GREENHOUSES: Greenhouses and similar structures may be erected of frame (type 4) construction when accessory to a one- or two-family dwelling on the same lot and when located not less than six (6) feet from interior lot lines or any building.

303.4 SHEDS: Sheds open on the long side not more than fifteen (15) feet in height nor more than five hundred (500) square feet in area may be erected of frame (type 4) construction when located not less than six (6) feet from the lot lines.

303.5 BUILDERS' SHANTIES AND REVIEWING STANDS: Temporary builders' shanties erected in connection with approved building operations, platforms, reviewing stands, and other similar miscellaneous structures may be erected of frame (type 4) construction for a limited period of time as approved by the building official.

303.6 PRIVATE GARAGES: Private garages not more than one (1) story nor more than fifteen (15) feet in height when accessory to a one- or two-family dwelling may be erected of protected frame (type 4-A) construction not more than seven hundred and fifty (750) square feet in area, or of frame (type 4-B) construction not more than five hundred (500) square feet in area, when located not less than six (6) feet from interior lot lines or any building.

303.7 BINS, TANKS, TOWERS AND ROOF STRUCTURES

303.71 TIMBER CONSTRUCTION: Coal and material bins, water towers, tank structures and trestles may be erected of mill type heavy timber construction with dimensions not less than required for type 3-A construction, not over thirty-five (35) feet in height, when located

thirty (30) feet from the interior lot lines or any building, except when located on lot lines along a railroad right of way or waterfront.

303.72 STRUCTURES ON BUILDINGS: Aerial supports not more than twelve (12) feet in height, water tanks and flag poles may be erected of wood on buildings, not more than three (3) stories nor more than forty (40) feet in height, and drip bars in cooling towers may be constructed of wood.

303.8 MOTOR FUEL SERVICE STATIONS: Gasoline service stations, and structures of similar business uses, not including high hazard uses, may be erected of unprotected noncombustible (type 2-C) construction within the height and area limits of use group E of table 2-6 provided thay are located less than eleven (11) feet from the lot line or any building.

303.9 BUS AND PASSENGER TERMINALS: Roofs over parking lots, bus and passenger terminals may be erected one story and not over twenty (20) feet in height and not more than eleven thousand (11,000) square feet in area of noncombustible (type 2-C) construction or of heavy timber mill (type 3-A) construction.

303.10 STORE FRONTS: Wood veneers of one (1) inch nominal thickness or exterior grade plywood not less than three-eighths (3/8) inch thick may be used on store fronts when facing public streets; provided the veneer does not exceed one (1) story in height and is applied to noncombustible backing or is furred not to exceed one and five-eighths (1-5/8) inch and firestopped in accordance with sections 874 and 912.2.

SECTION 304.0 RESTRICTIONS OF FIRE DISTRICT NO. 2

All buildings and structures hereafter erected within the boundaries of Fire District No. 2 shall be fireproof (type 1), noncombustible (type 2) or exterior masonry wall (type 3) construction as regulated by table 2-5 and shall be constructed within the height and area limitations of table 2-6; except that all the variations permitted in Fire District No. 1 shall apply to permissible construction in Fire District No. 2 with the following additional exceptions:

304.1 DWELLINGS: One and two-family dwellings (use group L-3) may be erected of protected frame (type 4-A) construction when not less than three (3) feet from interior lot lines and of unprotected frame (type 4-B) construction when not less than six (6) feet from interior lot lines within the height and area limitations of table 2-6. Roof coverings shall be of Class A, B or C roofings complying with the provisions of article 9.

304.2 VERANDAS: Verandas, balconies, entrance porticos and similar appurtenant structures on dwellings, not exceeding ten (10) feet in depth nor projecting more than two (2) feet above the second story floor beams may be erected of frame (type 4-B) construction provided they do not extend nearer than five (5) feet to the lot line. When connected to a similar structure of an adjoining building, they shall be separated therefrom by walls of two (2) hour fireresistance.

304.3 BOAT HOUSES: Boat houses not more than two (2) stories nor more than thirty (30) feet in height nor more than one thousand (1000) square feet in area may be erected of frame (type 4-B) construction.

304.4 EXTERIOR TRIM: Wood cornices and half timbering may be erected on residence (use group L) and business (use group C, D and E) buildings; and existing openings in exterior walls of masonry enclosed buildings (type 3-A, 3-B and 3-C) which are not required for ventilation or access purposes, may be filled in with wood studs, metal lath and stucco or other approved construction of equal fireresistance.

SECTION 305.0 RESTRICTIONS OUTSIDE FIRE LIMITS

Outside the fire limits, all types of construction except as herein specifically prohibited, or for which special approval is required in connection with high hazard uses and occupancies in article 4, shall be permitted within the height and area limitations of table 2-6.

305.1 LOT LINE SEPARATION: In frame construction an exterior wall erected less than six (6) feet from its adjacent lot line shall be of three-quarter (3/4) hour fireresistive construction, including opening protectives except store front and window and door openings in one- and two-family dwellings, but in no case shall such wall be located less than three (3) feet from interior lot lines.

305.2 ROOF COVERINGS: Roof coverings shall conform to the fireresistive requirements for Class A, B, C or non-rated roofings complying with the provisions of sections 903 and 928.

SECTION 306.0 EXISTING BUILDINGS

306.1 ALTERATIONS

306.11 LIMITATIONS: Nothing in these provisions shall be deemed to prohibit alterations within the limitations of section 106.0 provided no unlawful change of use is involved.

306.12 MINOR CHANGES: Changes, alterations or repairs to the interior of a building and to the front facing a street or other public space may be permitted provided such changes, in the opinion of the building official, do not increase the size, or the fire hazard of the building, or endanger the public safety and are not specifically prohibited by this Code.

306.13 EXISTING PROJECTIONS: No change or enlargement shall be made to an existing part of a building now projecting beyond the street lot line or building line where such is established by law, except in conformity to the provisions of section 312 governing new construction.

306.2 INCREASE IN HEIGHT AND AREA: It shall be unlawful to increase the height or area of an existing building or structure unless it is of a type of construction permitted for new buildings of the increased height and area and use group within the fire district in which it is located and as regulated by table 2-6.

306.3 EXISTING EXCESSIVE AREA: Any building heretofore lawfully approved which exceeds the maximum allowable area specified in table 2-6 may be extended if the addition is separated from the existing building by an approved fire wall or fire division meeting the requirements of article 9 and table 2-5 and the additional area does not exceed the limits of table 2-6 for the specific use group and type of construction.

307.0 GENERAL AREA AND HEIGHT LIMITATIONS

All buildings, structures and parts thereof erected or altered shall be subject to the requirements of table 2-5 and table 2-6 for the appropriate type of construction and use groups classification involved subject to any specific modifications and exceptions allowed in this code.

307.1 AREA LIMIT: The area limitations specified in table 2-6 shall apply to all buildings fronting on a street, or public space not less than thirty (30) feet in width accessible to a public street.

307.2 HEIGHT LIMIT: The height in feet and number of stories specified in table 2-6 shall apply to all buildings and to all separate parts of a building enclosed within lawful fire walls complying with the provisions of article 9.

307.3 MULTI-STORY BUILDINGS: Buildings more than one story in height shall be subject to the area requirements of the table 2-6 and modified by the following table of factors:

TABLE 3-1
PERCENT REDUCTION
IN THE AREA LIMITS OF TABLE 2-6

No. of Stories	1A & 1B	2A	2B	2C	3A & 3B	3C	4A & 4B
1	None	None	None	None	None	None	None
2	None	None	None	None	None	None	None
3	None	5%	20%	20%	20%	20%	20%
4	None	10%	20%	20%	20%	20%	
5	None	15%	30%		30%		
6	None	20%	40%		40%		
7	None	25%	50%				
8	None	30%	60%				
9	None	35%	70%				
10	None						

SECTION 308.0 AREA EXCEPTIONS

The provisions of this section shall modify the area limits of table 2-6 as herein specified.

308.1 STREET FRONTAGE INCREASE: When a building or structure has more than twenty-five (25) per cent of the building perimeter fronting on a street or other accessible unoccupied space not less than thirty (30) feet in width leading to a street, the tabular areas may be increased two (2) per cent for each one (1) per cent of such excess frontage.

308.2 SPRINKLER INCREASE: When a building is equipped with an approved one source automatic sprinkler system, unless such sprinkler system is required by the provisions of article 4 for structures of special use and occupancy, the tabular values may be increased by two hundred (200) per cent for one (1) story buildings and one hundred (100) per cent for buildings more than one (1) story in height.

308.3 MAXIMUM TOTAL AREA: The maximum total area under the combined provisions of sections 308.1 and 308.2 shall not exceed three and one-half (3½) times the tabular area in table 2-6.

SECTION 309.0 UNLIMITED AREAS

309.1 ONE-STORY BUILDINGS: In other than frame construction, the area of all buildings of assembly (use group F-3), business, industrial mercantile and storage use groups not including high hazard uses, which do not exceed one (1) story or eighty-five (85) feet in height shall not be limited outside the fire limits; provided the exitway facilities comply with the provisions of section 604, an automatic sprinkler system is provided complying with the provisions of section 1212.0 and the building is isolated as specified in section 309.2 except that a sprinkler system shall not be required for buildings of type 2 or type 3A construction used exclusively for storage of noncombustible material not packed or crated in combustible material or as exempt by section 206.2 for special industrial uses.

309.11 SCHOOL BUILDINGS: School buildings, use group F-6, shall be subject to the provisions of Reference Standard F-6, Building Regulations for Schoolhouses, of the State Building Code Commission.

309.2 FIRE SEPARATION: The minimum fire separation on any side of one-story buildings of unlimited area shall be determined by the type of construction and fireresistance rating of the exterior wall adjacent thereto as herein specified:

Type of Construction	Fireresistance Rating of Exterior Bearing Walls	Minimum Fire Separation**	Fireresistance rating of bearing & nonbearing portions of exterior walls	Minimum Fire Separation
2A	2 hr.	30 ft.	-	-
2B	3/4 hr.	40 ft.	2 hr.*	30 ft.
2C	0 hr.	50 ft.	3 hr.**	30 ft.
3A	2 hr.	40 ft.	3 hr.**	30 ft.
3B	2 hr.	40 ft.	3 hr.**	30 ft.
3C	2 hr.	50 ft.	4 hr.**	30 ft.

* All exterior wall openings shall be protected with one and one-half rated approved opening protectives.

** All exterior wall openings shall be protected with three hour rated approved opening protectives.

*** When the fire separation exceeds the herein specified minimum, the requirements of Table 2-5, Row 1 (Exterior Walls with Fire Separation of 30 ft. or more: Bearing) shall apply.

SECTION 310.0 HEIGHT EXCEPTIONS

310.1 ROOF STRUCTURES: In applying the provisions of the Basic Code governing height limits, the following appurtenant structures shall not be included in the height of the building: roof tanks and their supports; ventilating, air conditioning and similar building service equipment; roof structures other than penthouses; chimneys and parapet walls not exceeding four (4) feet in height; unless the aggregate area of such structures including penthouses, exceeds one-third (1/3) of the area of the roof of the building upon which they are erected.

310.2 AUTOMATIC SPRINKLERS: Except in buildings where automatic sprinkler equipment is a requirement of article 4 or article 12 for special uses or occupancies, all structures of fireproof (type 1), noncombustible (type 2), and exterior masonry wall (type 3) construction, designed for business, industrial, mercantile, low or moderate hazard storage uses may be erected one (1) story or twenty (20) feet higher than specified in table 2-6 when equipped with an approved one-source automatic sprinkler system.

311.0 STREET ENCROACHMENTS

No part of any building hereafter erected and no additions to an existing building heretofore erected shall project beyond the lot lines or beyond the building line when such line is established by

the zoning law or any other statute controlling building construction, and irrespective of any other allowance for such encroachments, the following regulations shall apply:

311.1 BELOW GRADE: No part of a building hereafter erected below grade that is necessary for structural support of the building shall project beyond the lot lines except that the footings of street walls or their supports located at least eight (8) feet below grade may project not more than twelve (12) inches beyond the street lot line.

311.2 ABOVE GRADE: All projections hereafter permitted beyond the street lot line or the building lot line above grade shall be so constructed as to be readily removable without endangering the safety of the building.

311.3 PROJECTIONS NECESSARY FOR SAFETY: In any specific application, the building official may designate by approved rules such architectural features and accessories which are deemed desirable or necessary for the health or safety of the public and the extent to which they may project beyond the street lot line or the building line where such is established by statute, subject to all provisions and restructions that may be otherwise prescribed by law, ordinance or rule of the authorities having jurisdiction over streets or public spaces.

311.4 PERMIT REVOCABLE: Any permit granted or permission expressed or implied in the provisions of the Basic Code to construct a building so as to project beyond the street lot line or building line shall be revocable by the municipality at will.

311.5 EXISTING ENCROACHMENTS: Parts of existing buildings and structures which already project beyond the street lot line or building line may be maintained as constructed until their removal is directed by the proper municipal authorities.

SECTION 312.0 PERMISSIBLE STREET PROJECTIONS

Subject to such provisions as may be otherwise prescribed by law or ordinance, or by rule of the municipal authorities having jurisdiction over streets, highways, and public spaces, the following projections shall be permitted beyond the street lot line or the building line, as the case may be:

312.1 MAIN CORNICES OR ROOF EAVES located at least twelve (12) feet above the curb level shall project not more than three (3)feet;

312.2 BELT COURSES, LINTELS, SILLS, ARCHITRAVES, PEDIMENTS and similar architectural decorations shall project not more than four (4) inches when less than ten (10) feet above the curb level, and not more than ten (10) inches when ten (10) feet or more above the curb level;

312.3 ORNAMENTAL COLUMNS, OR PILASTERS including the bases and moldings which emphasize the main entrance of the building shall project not more than twelve (12) inches;

312.4 ENTRANCE STEPS shall project not more than twelve (12) inches and shall be guarded by cheek pieces not less than three (3) feet high or shall be located between ornamental columns or pilasters;

312.5 ORIEL WINDOWS with the lowest position at least ten (10) feet above the curb level shall project not more than two and one-half (2½) feet;

312.6 BALCONIES located at least ten (10) feet above the curb level shall project not more than three (3) feet except that when the balcony is required in connection with a fire escape or exterior stairway as an element of a means of egress, the projection may be increased, but not to exceed four (4) feet.

312.7 AWNINGS AND MARQUEES.

312.71 AWNINGS: Retractable or fixed awnings shall have clearances above the grade and shall be installed in accordance with the requirements of section 315.

312.72 MARQUEES: For the purpose of this section a marquee shall include any object or decoration attached to or a part of said marquee.

PROJECTION AND CLEARANCE - The horizontal clearance between a marquee and the curb line shall be not less than two-thirds (2/3) of the distance from the property line to the curb shall be not less than ten (10) feet above the ground or pavement below.

THICKNESS - The maximum height or thickness of a marquee measured vertically from its lowest to its highest point shall not exceed three (3) feet when the marquee projects more than two-thirds (2/3) of the distance from the property line to the curb line and shall not exceed nine (9) feet when the marquee is less than two-thirds (2/3) of the distance from the property line to the curb line.

ROOF CONSTRUCTION - The roof or any part thereof may be a skylight of approved plastics, or wired glass not less than one-fourth (¼) inch thick with no single pane more than eighteen (18) inches wide. Every roof and skylight of a marquee shall be sloped to downspouts which shall conduct any drainage from the marquee in a manner not to spill over the sidewalk.

LOCATION PROHIBITED - Every marquee shall be so located as not to interfere with the operation of any exterior standpipe or to obstruct the clear passage of stairways or exitway discharge from the building or the installation or maintenance of street lighting.

CONSTRUCTION - A marquee shall be supported entirely from the building and constructed of noncombustible material. Marquees shall be designed and constructed to withstand wind of other lateral loads

and live loads as required in article 7 of this Code. Structured members shall be protected to prevent deterioration as required by article 8.

312.8 AWNING COVERS OR BOXES located at least eight (8) feet above the curb level shall project not more than three (3) feet.

SECTION 313.0 PERMISSIBLE YARD AND COURT ENCROACHMENTS

No part of any building or structure shall extend into side courts, inner courts or yards required for light and ventilation of habitable and occupiable rooms by the provisions of article 5, or of the zoning law or other statutes controlling building construction, except as hereinafter provided; but in no case shall the encroachment exceed twenty (20) per cent of the legal area of yard or court required for light and ventilation purposes.

313.1 ROOF EAVES shall project not more than three (3) feet beyond the face of the wall.

313.2 STEPS AND ARCHITECTURAL FEATURES: Steps, window sills, belt courses and similar architectural features, rain leaders and chimneys shall project not more than two (2) feet beyond the face of the wall.

313.3 EXTERIOR STAIRWAYS AND FIRE ESCAPES: Outside stairways, smoke-proof tower balconies, fire escapes or other required elements of a means of egress shall project not more than four (4) feet beyond the face of the wall.

SECTION 314.0 SPECIAL AND TEMPORARY PROJECTIONS

314.1 ALLEY PROJECTIONS: The permissible projection beyond street lot lines shall apply in general to building projections into alleyways except as may be modified by the local administrative authority having jurisdiction or by special deed restriction.

314.2 SPECIAL PERMITS: When authorized by special permit, vestibules and storm doors may be erected for periods of time not exceeding seven (7) months in any one year, and shall project not more than three (3) feet nor more than one-fourth (¼) the width of the sidewalk beyond the street lot line. Temporary entrance awnings may be erected with a minimum clearance of seven (7) feet to the lowest portion of the hood or awning when supported on removable steel or other approved noncombustible supports.

SECTION 315.0 AWNINGS AND CANOPIES

315.1 PERMIT: A permit shall be obtained from the building official for the erection, repair or replacement of any fixed awning, canopy or hood except as provided in section 315.11, and for any retractable awning located at the first story level and extending over the public

street or over any portion of a court or yard beside a building serving as a passage from a required exitway discharge to a public street.

315.11 EXEMPTION FROM PERMIT: No permit shall be required for the erection, repair or replacement of fixed or retractable awnings installed on one- and two-family dwellings, unless they project over public property, or for retractable awnings installed above the first story or where the awning does not project ober the public street or over any court or yard serving as a passage from a required exitway to a public street.

315.2 INSTALLATION OF AWNINGS.

315.21 RETRACTABLE AWNINGS: There shall be a minimum clearance of seven (7) feet from the sidewalk to the lowest part of the framework or any fixed portion of any retractable awning, except that the bottom of the valance of canvas awnings may extend to six (6) feet nine (9) inches above the sidewalk. Retractable awnings shall be securely fastened to the building and shall not extend closer than twelve (12) inches from the curb line. They shall be equipped with a mechanism or device for raising and holding the awning in a retracted or closed position against the face of the building.

315.22 FIXED OR PERMANENT AWNINGS: The clearance from the sidewalk to the lowest part of any fixed or permanent awning shall be the same as required in section 315.21 for retractable awnings. Fixed or permanent awnings installed above the first story shall not project more than four (4) feet.

315.3 CANOPIES: Canopies shall be constructed of a metal framework, with an approved covering, attached to the building at the inner end and supported at the outer end by not more than two (2) stanchions with braces anchored in an approved manner and placed not less than two (2) feet in from the curb line. The horizontal portion of the framework shall be not less than eight (8) feet nor more than twelve (12) feet above the sidewalk and the clearance between the covering or valance and the sidewalk shall be not less than seven (7) feet. The width of canopies shall not exceed eight (8) feet.

315.4 SPECIAL APPLICATIONS OF AWNINGS: Rigid awnings supported in whole or part by members resting on the ground and used for patio covers, car ports, summer houses or other similar uses shall comply with the requirements of section 315.5 for design and structure. Such structures shall be braced as required to provide rigidity.

315.5 DESIGN AND CONSTRUCTION: Fixed awnings, canopies and similar structures shall be designed and constructed to withstand wind or other lateral loads and live loads as required by article 7 of the Basic Code with due allowance for shape, open construction and similar features that relieve the pressures or loads. Structural members shall be protected to prevent deterioration.

SECTION 316.0 SUBDIVISION OF ATTIC SPACES

The attic spaces of all buildings, except where the roof and attic are of noncombustible or fireproof construction, shall be subdivided into areas not exceeding three thousand (3,000) square feet by means of approved fire stops. When doors or other openings are provided in such subdividing partitions, they shall be of noncombustible or similarly protected materials and the construction shall be tightly fitted around all ducts or other assemblies piercing such partitions.

SECTION 317.0 TEMPORARY STRUCTURES

Pursuant to a variance granted by the local board of appeals under the provisions of section 126.0, the building official may issue a permit for temporary construction as approved by the board of appeals. Such permits shall be limited as to time of service, but in no case shall such temporary construction be permitted for more than one year.

317.1 SPECIAL APPROVAL: All temporary construction shall conform to structural strength, fire safety, means of egress, light, ventilation and sanitary requirements of this Code necessary to insure public health, safety and general welfare.

317.2 TERMINATION OF APPROVAL: The building official is hereby authorized to terminate such special approval and to order the demolition of any such construction at his discretion, or as directed by the decision of the local board of appeals.

ARTICLE 4

SPECIAL USE AND OCCUPANCY REQUIREMENTS

SECTION 400.0 SCOPE

In addition to the general requirements of the Basic Code governing the location, construction and equipment of all buildings and structures and the fireresistive, height and area limitations of tables 2-5 and 2-6 the provisions of this article shall control all buildings and structures designed for high hazard uses and occupancies which involve extreme fire, smoke, explosion or toxic gas risks, and places of assembly in which people congregate in large numbers and which are susceptible to panic incidental to crowds. Except as herein specifically provided, the applicable standards listed in the reference standards of this article shall be deemed to comply with the requirements of this article.

Chemical plants, packing plants, grain elevators, refineries, flour mills and other special structures may be constructed in accordance with the recognized practices and requirements of the specific industry. The building official may permit such variations from the requirements of the Basic Code which will secure reasonable and economical construction with the necessary fire, life and property safeguards. In granting such variations, due regard shall be given to the isolation of the structure and fire hazard from and to surrounding property.

400.1 USES INVOLVING EXPLOSION HAZARDS: The provisions of this article shall apply to all uses involving the storage, manufacture, handling or filling of flammable and volatile solids, liquids or gases which generate combustible and explosive air-vapor mixtures and toxic gases including nitrocellulose film; pyroxylin plastics; grain and other combustible dusts and pulverized fuels; combustible fibers; pyroxylin lacquer-spraying operations; liquefied petroleum gases; alcohol, ether and gasoline; flammable dusts and residues resulting from fabrication, grinding and buffing operations, and all other explosion hazard risks.

400.2 SPECIAL HIGH HAZARDS: When the fire hazard potential exceeds that which would be considered within the range of fire loading acceptable for high hazard use, the requirements of table 2-5 may be increased to provide additional fireresistance in proportion to the excess fire loading. Where high hazard uses exceed five (5) stories or sixty-five (65) feet in height, requirements in excess of those required by table 2-5 may be specified in proportion to the anticipated additional fire hazard.

400.3 MEANS OF EGRESS: The means of egress for buildings of hazardous uses and occupancies shall conform to the requirements of article 6, except as may be modified by more restrictive provisions of this article for specific uses.

400.4 HEATING AND VENTING: The requirements herein prescribed for the installation of heating and venting appliances and equipment for high hazard uses and occupancies shall be construed as supplemental to the provisions of article 5, 10, 11 and 18.

400.5 LIGHT AND ELECTRIC WIRING: Whenever flash fires and explosion hazards are involved, all artificial lighting shall be restricted to incandescent electric lights or other approved lighting with keyless sockets and dust-tight, vapor-proof globes protected against mechanical injury. All wiring in vaults or compartments for the storage of highly flammable materials shall be in metal or other approved conduit complying with the provisions of the Massachusetts State Electrical Code.

400.6 BOILER AND HAZARDOUS EQUIPMENT ROOMS: Boilers and other equipment or devices, including breechings which involve flame or spark producing apparatus shall not be exposed to fire or explosive-hazard gases, vapors or volatile flammable liquids. Such rooms and equipment shall be segregated by construction of not less than two (2) hour fireresistance except as may be required for specific uses, without openings in the enclosure walls and with means of direct ingress and egress from the exterior, or such equipment shall be located in accessory structures segregated from the main building.

400.7 FIRE-FIGHTING AND EXTINGUISHING EQUIPMENT: All buildings designed for specific hazardous uses shall be protected with approved automatic sprinkler systems or such other fire-extinguishing and auxiliary equipment herein provided and in accordance with the requirements of article 12.

400.8 SEGREGATION OF STORAGE SPACES: All rooms and spaces used for the storage of volatile and flammable materials shall be separately enclosed and segregated with fireresistive construction as herein required for specific uses and occupancies.

400.9 RESTRICTED LOCATIONS: No high hazard use may be located within two hundred (200) feet of the nearest wall of a building classified in a public assembly or institutional use group.

SECTION 401.0 DEFINITIONS

AIRPLANE HANGAR, PRIVATE: a hangar for the storage of four (4) or less single motor planes and in which no volatile or flammable oil is handled, stored or kept other than that contained in the fuel storage tank of the plane.

-PUBLIC: a building for the storage, care or repair of private or commercial airplanes not included in the term "private airplane hangar."

EXITWAY DISCHARGE COURT: an exterior unoccupied space which is open to the sky for its entire area, located on the same lot with a theatre or other assembly building which it serves exclusively as an unobstructed passageway to the street or other public space.

FLAMMABLE: Subject to easy ignition and rapid flaming combustion.

FOYER: the enclosed space surrounding or in the rear of the auditorium of a theatre or other place of assembly which is completely shut off from the auditorium and is used as an assembly or waiting space for the occupants.

FUEL OIL: a liquid mixture or compound derived from petroleum which does not emit flammable vapor below a temperature of one hundred and twenty-five (125) degrees F. in a Tag closed-cup tester.

GARAGE, PRIVATE: a garage for four (4) or less passenger motor vehicles with no provision for repairing or servicing such vehicles for profit.

GARAGE, PUBLIC: a building or structure for the storage or parking of more than four (4) passenger motor vehicles, or more than one (1) commercial motor vehicle, and in which provision may be made for the dispensing of gasoline, oil or similar products for the servicing of such vehicles. Public garages shall be classified according to their specific use in one (1) of the following groups:

-GROUP 1: a public garage in which provision is made for the care, storage, repair or painting of motor vehicles.

-GROUP 2: a public garage used exclusively for passenger vehicles that will accommodate not more nine (9) passengers.

GRANDSTAND: any structure, except movable seating and sectional benches, intended primarily to support individuals for the purposes of assembly, but shall not apply to the permanent seating in theatres, churches, auditoriums and similar buildings.

KEROSENE: an oil or liquid product of petroleum which does not emit a flammable vapor below a temperature of one hundred and fifteen (115) degrees F. when tested in a Tag closed-cup tester.

LOBBY: the enclosed vestibule between the principal entrance to the building and the doors to the main floor of the auditorium or assembly room of a theatre or place of assembly or to the main floor corridor of a business building.

MOBILE HOME: a dwelling unit built on a chassis and containing complete electrical, plumbing and sanitary facilities, and designed to be installed on a temporary or permanent foundation for permanent living quarters.

MOTOR FUEL SERVICE STATION: a structure, building or premise or any portion thereof where a flammable fluid is stored, housed or sold for supply to motor vehicles.

MOTOR VEHICLE REPAIR SHOP: a building, structure or enclosure in which the general business of repairing motor vehicles is conducted including a public garage.

PARKING STRUCTURE, OPEN: a structure for the parking of passenger cars wherein two (2) or more sides of such structure are not less than fifty (50) percent open on each floor or level for fifty (50) percent of the distance from the floor to the ceiling and wherein no provision for the repairing of such vehicles is made. Such open parking structures are not classified as public garages, but shall comply with the requirements of section 905.2.

PYROXYLIN PLASTIC: any nitro-cellulose product or compound soluble in a volatile, flammable liquid, including such substances as celluloid, pyroxylin, fiberloid and other cellulose nitrates (other than nitro-cellulose film) which are susceptible to explosion from rapid ignition of the gases emitted therefrom.

See definition of Raised Platform 2-15

STAGE: a partially enclosed portion of an assembly building which is designed or used for the presentation of plays, demonstrations, or other entertainment wherein scenery, drops, or other effects may be installed or used; and where the distance between the top of the proscenium opening and the ceiling of the stage is more than five (5) feet; and the stage extends seventeen (17) feet or more in back of the proscenium arch or there is a gridiron.

TRAVEL TRAILER: a vehicular, portable structure built on a chassis and designed to be used for temporary occupancy for travel, recreational or vacation use; with the manufacturer's permanent identification "Travel Trailer," thereon; and when factory equipped for the road, being of any length provided its gross weight does not exceed forty-five hundred (4500) pounds, or being of any weight provided its overall length does not exceed twenty-eight (28) feet.

SECTION 402.0 EXPLOSION HAZARDS

Every structure, room or space occupied for uses involving explosion hazards shall be equipped and vented with explosion relief systems and devices arranged for automatic release under predetermined increase in pressure as herein provided for specific uses or in accordance with approved engineering standards and practice.

402.1 VENTING DEVICES: Venting devices to relieve the pressure resulting from explosive air-vapor mixtures shall consist of windows, sky-lights, vent flues or releasing roof or wall panels which discharge directly to the open air or to a public place or other unoc-

cupied space not less than twenty (20) feet in width on the same lot. Such releasing devices shall be so located that the discharge end shall be not less than ten (10) feet vertically and twenty (20) feet horizontally from window openings or means of egress facilities in the same or adjoining buildings or structures. The exhaust shall always be in the direction of least exposure and never into the interior of the building.

402.2 AREA OF VENTS: The aggregate clear vent relief area shall be regulated by the type of construction of the building and shall be not less than herein prescribed:

Heavy reinforced concrete frame	1 sq. ft. for 80 cubic feet of volume
Light structural steel frame and ordinary construction	1 sq. ft. for 65 cubic feet of volume
Light wood frame construction	1 sq. ft. for 50 cubic feet of volume

In no case shall the combined area of open windows, pivoted sash or wall panels arranged to open under internal pressure be less than ten (10) percent of the area of the enclosure walls, with not less than fifty (50) percent of the opening arranged for automatic release.

402.3 CONSTRUCTION OF VENTS: All explosion relief devices shall be of an approved type constructed of light weight, noncombustible and corrosion-resistive materials, and the discharge end shall be protected with approved screens of not more than three-quarter (3/4) inch mesh, arranged to blow out under relatively low pressures.

SECTION 403.0 VOLATILE FLAMMABLES

403.1 CONTROL OF USE.

403.11 INSIDE STORAGE: Refer to FPR-4, FPR-8, and FPR-13 for requirements.

403.12 HANDLING: Refer to FPR-4 for requirements.

403.13 CONSTRUCTION OF ENCLOSURES: Process rooms shall be separated from other uses and occupancies by walls, floors and ceilings of not less than two (2) hours fireresistance with one and one-half (1½) hour fire doors or the approved labeled equivalent complying with article 9. The interior door openings shall be provided with non-combustible sills not less than six (6) inches high and the room shall be vented as required in section 402. Floors shall be waterproofed and drained to comply with section 871.

403.14 FIRE PROTECTION: First aid fire appliances and automatic sprinklers or other extinguishing equipment shall be provided in accordance with article 12 and the standards listed in the reference standards of this article.

403.2 MAIN STORAGE: Main storage system of volatile flammable liquids shall be constructed and installed in accordance with the applicable standards listed in this article subject to the approval of the fire official. Any tank greater than ten thousand (10,000) gallons capacity shall be subject to the provisions of the Department of Public Safety Board of Boiler Rules. Such storage may be either outside underground, outside aboveground, inside underground, or outside storage house. No above ground bulk storage tank shall be located less than three hundred (300) feet from any assembly buildings (use group F) or institutional (use group H) uses.

403.21 OUTSIDE UNDERGROUND SYSTEM: Outside tanks shall be buried underground below the basement level of adjacent buildings, with the top of the tanks not less than two (2) feet below grade or with a reinforced concrete or other approved structural cover not less than four (4) inches thick and a twelve (12) inch earth cover. The maximum capacity of such tanks shall be limited by their location in respect to adjacent buildings which are not an essential part of the installation and adjacent lot lines as provided in table 4-1.

Table 4-1 - Capacity of Outside Underground Tanks for Volatile Flammable Liquids

Fire separation in feet	Quantity of storage in gallons
50	Unlimited
40	50,000
30	20,000
25	12,000
20	6,000
10	3,000

When within ten (10) feet of any building not an essential part of the installation, and the top of the tank is above the lowest floor of the building, the capacity of the tank shall be not more than five hundred and fifty (550) gallons.

The capacity of storage of combustible liquids other than volatile flammable as herein defined shall be restricted to five (5) times the values specified in table 4-1.

403.22 OUTSIDE ABOVEGROUND SYSTEM: Above ground tanks shall be located only outside the fire limits; and the capacity, location, construction and exposures shall be subject to special approvals of the building official and the fire official; but in no case shall the fire separation be less than specified in table 4-2. Tanks in excess of ten thousand (10,000) gallon capacity shall be subject to the Department of Public Safety Board of Boiler Rules.

403.23 INSIDE UNDERGROUND SYSTEM: Inside underground tanks shall be located not less than two (2) feet below the level of the lowest floor of the building in which located or any other building within a radius of ten (10) feet of the tank. In no case shall such tanks be located under the sidewalk or beyond the building line. It shall be unlawful to cover any tanks from sight until after inspection and test and written approval of the building official.

Table 4-2 - Capacity of Outside Aboveground Tanks for Volatile Flammable Liquids

Fire seperation in feet	Quantity of Storage in gallons
50.....	50,000
40.....	30,000
30.....	24,000
20.....	12,000

The maximum limit of individual tank capacity shall be not more than five hundred and fifty (550) gallons and the entire system shall be subject to special approval of the building and fire officials.

403.24 OUTSIDE STORAGE HOUSE: All outside storage houses shall be constructed of noncombustible (type 2) construction or better. No opening shall be permitted in the enclosure walls within eleven (11) feet of adjoining property lines or with a fire exposure of less than eleven (11) feet from any building or structure not part of the installation.

403.25 SPECIAL RESTRICTIONS: The building official may require greater fire separations or he may limit storage capacities under severe exposure hazard conditions when necessary for public safety.

SECTION 404.0 EXISTING BUILDINGS

404.1 SPECIAL PERMIT FOR EXISTING USES: Any existing hazardous use which was heretofore authorized by a permit issued under the provisions of law or the regulations of the fire official may be continued by special permit provided the continuance of such use or occupancy does not endanger the public safety.

404.2 EXISTING USE PROHIBITED: No existing building of frame (type 4) construction which is more than two (2) stories in height or more than five thousand (5000) square feet in area shall be continued in use or hereafter occupied for any use which represents an exceptional hazard with respect to fire or explosion.

404.3 PLACES OF ASSEMBLY.

404.31 CHANGE OF USE: No existing building or structure or part thereof shall be altered or converted into a place of assembly unless it complies with all provisions of this Code applicable to places of public assembly hereafter erected.

404.32 EXISTING USE ALTERED: When an existing building or structure heretofore used as a place of public assembly is altered and the cost of such alteration is more than fifty (50) percent of the physical value of the building as defined in section 106.5, all provisions of this Code relating to new places of public assembly shall be complied with. When the cost of such alteration is less than fifty (50) percent of the physical value of the building, such alterations shall comply as nearly as is practicable with the provisions of this Code which govern the arrangement and construction of seats, aisles, passageways, stage and appurtenant rooms, fire-fighting and extinguishing equipment and the adequacy of means of egress.

404.33 INCREASE OF OCCUPANCY LOAD: Whenever the occupancy load of an existing place of public assembly is increased beyond the approved capacity of its exitways, the building or parts thereof shall be made to comply in all respects with the requirements for a new building hereafter erected for such public assembly use.

SECTION 404.4 SWIMMING POOLS

404.41 CHANGE OF USE: No existing pool used for swimming or bathing or accessory equipment of part thereof shall be altered or converted for any other use unless it complies with all provisions of this Code applicable to the use intended.

404.42 CONTINUATION OF EXISTING USE: Existing swimming pools may be continued without change, provided the safety requirements are observed where required by the building official.

SECTION 405.0 LIQUEFIED PETROLEUM GASES

The provisions of this section shall apply to the design, construction, location, installation and operation of propane, butane and other petroleum gases, normally stored in the liquid state

under pressure for use in all buildings and structures. Refineries, tank farms and utility gas plants shall be subject to special approvals in accordance with accepted engineering practice as defined in the reference standards of this article.

405.1 THE COMMONWEALTH OF MASSACHUSETTS REGULATIONS: The design, construction, location, installation and operation of facilities for propane, butane and other petroleum gases, normally stored in the liquid state under pressure for use in all buildings and structures shall be in conformance with the Massachusetts State Fire Prevention Regulations, FPR-5; the Department of Public Safety Board of Boiler Rules; and other standards listed in the reference standards of this article.

SECTION 406.0 PYROXYLIN PLASTICS

The provisions of this section, including the reference standards of this article shall regulate all buildings, structures and parts thereof used for the storage, handling or fabrication of pyroxylin plastics permitted by Massachusetts law whether as raw material, process, finished product or scrap.

406.1 EXCEPTIONS: The provisions of this section shall not apply to the manufacture, use or storage of nitro-cellulose film or the incidental storage of articles manufactured from pyroxylin plastics offered for sale in mercantile buildings. (See section 205.)

406.2 RESTRICTIONS: No permit for the storage or manufacture of pyroxylin plastics, except as specified in section 406.1, shall be issued for a building or structure hereafter erected, altered or used which is occupied or located as follows:

406.21 PLACE OF ASSEMBLY: Within fifty (50) feet of the nearest wall of a school, theatre or other place of public assembly;

406.22 RESIDENTIAL BUILDING: As a residential building, use groups L-1, L-2 or L-3;

406.23 HIGH HAZARD USES: In quantities exceeding one thousand (1000) pounds in buildings where paints, varnishes or lacquers are manufactured, stored or kept for sale; or where matches, resin, oils, hemp, cotton or any explosives are stored or kept for sale;

406.24 OTHER FLAMMABLE MATERIALS: Where drygoods, garments or other materials of a highly flammable nature are manufactured in any portion of the building above that used for nitro-cellulose products;

406.25 TENANT FACTORY BUILDING: In quantities exceeding one hundred (100) pounds in any tenant factory building (use Group D) in which more than five (5) people are employed or likely to congregate on one floor at any one time.

406.3 INSIDE STORAGE: All pyroxylin raw material and products intended for use in further manufacture shall be stored as herein provided:

406.31 CABINETS: Quantities of more than twenty-five (25) pounds and not more than five hundred (500) pounds shall be stored in approved cabinets constructed of noncombustible materials but in no case shall the total quantity of storage be more than one thousand (1000) pounds in any workroom or space enclosed in floors, walls and ceilings of not less than two (2) hours fireresistance;

406.32 VAULTS: Quantities of more than one thousand (1000) pounds and not more than ten thousand (10,000) pounds shall be stored in vaults enclosed in floors, walls and ceilings of not less than four (4) hours fireresistance. The interior storage volume of the vault shall be not more than fifteen hundred (1500) cubic feet and the vault shall be constructed vapor and gastight in accordance with the approved rules, with one and one-half (1½) hour vapor-tight fire doors or the approved labeled fire door assembly equivalent on each side of the door opening. The vault shall be drained and provided with scuppers.

406.33 TOTE BOXES AND SCRAP CONTAINERS: During manufacture, pyroxylin materials and products not stored in finished stock rooms, cabinets or vaults shall be kept in approved covered noncombustible tote boxes. Scrap and other refuse material shall be collected in approved noncombustible containers in quantities not greater than three hundred and fifty (350) pounds and removed at frequent intervals as directed by the building official with the approval of the fire official;

406.34 VENTILATION: Each separate compartment in storage vaults shall be vented directly to the outer air through flues complying with the requirements of article 10 for low temperature chimneys, or exterior metal smokestacks, or as otherwise provided in the approved rules. The vent shall discharge not less than four (4) feet above the roof of the building or on a street, court or other open space not less than fifty (50) feet distant from any other opening in adjoining walls which are not in the same plane, nor nearer than twenty-five (25) feet vertically or horizontally to an exterior stairway, fire escape or exitway discharge. The area of the vent shall be not less than one (1) square inch for each seven (7) pounds of pyroxylin stored;

406.35 STRUCTURAL STRENGTH: The floors, walls, roof and doors of all vaults, structures or buildings used for the storage or manufacture of pyroxylin materials and products shall be designed to resist an inside pressure load of not less than three hundred (300) pounds per square foot;

406.36 FIRE PROTECTION: Vaults located within buildings for the storage of raw pyroxylin shall be protected with an approved automatic sprinkler system capable of discharging one and sixty-six one-hundredths (1.66) gallons per minute per square feet over the area of the vault.

406.4 ISOLATED STORAGE BUILDINGS: Pyroxylin products in quantities greater than permitted for interior storage shall be housed in isolated storage buildings. Such buidings shall be used for no purpose other than packing, receiving, shipping and storage of pyroxylin plastics unless otherwise approved by the building official.

406.41 CAPACITY: The maximum storage in any fire area enclosed in construction of four (4) hours fireresistance shall be not greater than one hundred thousand (100,000) pounds. The storage capacity of the building and its separation from lot lines and other buildings on the same lot shall be limited as provided in table 4-3. When equipped with an approved automatic sprinkler system complying with the provisions of article 12 and as herein modified, the exposure distances may be decreased fifty (50) percent. Such systems shall be provided with not less than one (1) automatic sprinkler head for each thirty-two (32) square feet of protected area.

Table 4-3 - Exposure Distance for Pyroxylin Storage Buildings

Maximum quantity stored in pounds	Fire separation from lot line or other buildings in feet
1,000	40
2,000	50
3,000	60
4,000	70
5,000	80
10,000	100
20,000	125
30,000	150
40,000	160
50,000	180
75,000	200
100,000	225
150,000	250
300,000	300

406.5 FIRE PROTECTION.

406.51 HEATING EQUIPMENT: All radiators, heating coils, piping and heating apparatus shall be protected with approved noncombustible mesh to maintain a clearance of six (6) inches of all pyroxylin products from such equipment. All piping and risers within six (6) feet of the floor shall be insulated with approved noncombustible covering unless protected with wire guards.

406.52 LIGHTING CONTROL: All lighting shall comply with the provisions of section 400.5 and shall be controlled from panel boards located outside of storage compartments and vaults.

406.53 STANDPIPES: First-aid standpipes shall be provided for each five thousand (5000) square feet of floor area equipped with one and one-half (1½) inch hose, complying with article 12.

406.54 AUTOMATIC SPRINKLERS: All manufacturing and storage spaces and vaults where required shall be protected with an approved automatic sprinkler system as herein specified and with fire pails and portable fire extinguishers complying with article 12.

406.55 SPECIAL PROTECTION: Special chemical extinguishers and other first aid fire appliances shall be provided around motors and other electrical equipment in accordance with the approved rules.

SECTION 407.0 USE AND STORAGE OF FLAMMABLE FILM

407.1 PERMIT REQUIRED: No permit for handling, use, storage or recovery of flammable film shall be issued for any building located as specified in section 406.2; except that those restrictions shall not apply to the screening and projection rooms of theatres and other places of amusement or instruction. It shall be unlawful to store, stock or use any nitro-cellulose or other flammable film in quantities of more than two thousand (2000) feet in length or more than ten (10) pounds in weight unless approved by the fire official. All installations shall comply with the applicable standards listed in the reference standards of this article.

407.2 STORAGE: Other than motion picture projection and rewind rooms, or as herein specifically exempted, all rooms in which flammable film is stored or handled shall be enclosed in not less than two (2) hour fireresistive construction complying with the provisions of article 9. All film, except when in process or use, shall be kept in approved closed containers.

407.21 CABINETS: Flammable film in amounts of twenty-five (25) to one thousand (1000) pounds shall be stored in approved noncombustible cabinets constructed and vented in accordance with the approved rules. No one cabinet shall contain more than three hundred and seventy-five (375) pounds. All cabinets with a capacity of more than seventy-five (75) pounds shall be equipped with not less than one (1) automatic sprinkler head.

407.22 VAULTS: Flammable film in amounts greater than one thousand (1000) pounds shall be kept in vaults constructed as provided in section 406; except that the interior storage volume shall not exceed seven hundred and fifty (750) cubic feet.

407.23 ROOMS: Unexposed film may be stored in the original approved shipping cases complying with the rules of the Interstate Commerce Commission in rooms equipped with an approved one-source sprinkler system complying with the provisions of section 406.36.

407.24 VENTILATION: Storage rooms shall be ventilated as specified in section 406.34 with the vents arranged to open automatically in the event of fire, in accordance with the approved rules.

407.25 LIGHTING: Artificial illumination shall comply with section 400.5 except that other approved forms of lights may be used in film studios.

407.26 HEATING: All heating equipment and installations shall conform to the requirements of section 406.51. The duct systems of warm air heating and air conditioning systems shall comply with article 18, and shall be protected with automatic fire dampers to cut off all rooms in which film is handled from all other rooms and spaces in the building. The heating of film vaults shall be automatically controlled to a maximum temperature of seventy (70) degrees F.

407.27 FIRE PROTECTION: Approved automatic sprinkler systems shall be provided in all buildings and structures and parts thereof in which flammable film is stored or handled in amounts of more than fifty (50) pounds and as herein specifically required, except in projection booths and rewind rooms conforming to the requirements of section 407.3 and 407.4.

407.3 PROJECTION ROOMS: Every room for the use and operation of motion picture projectors hereafter installed as an integral part of a building shall be enclosed in walls, floor and ceiling of approved noncombustible materials and construction, as herein provided.

407.31 CONSTRUCTION OF PROJECTION ROOMS: The size of the room shall be adequate to accommodate the apparatus and equipment and permit manual operation, but in no case less than forty-eight (48) square feet in area and seven (7) feet in height for one projector and twenty-four (24) square feet for each additional machine. The enclosure shall be constructed smoke and vapor-tight of not less than two (2) hour fireresistance. Observation and projector openings shall in no case exceed twelve (12) inches in any dimension and shall be equipped with automatic metal, or other approved noncombustible shutters capable of auxiliary manual operation from the outside.

407.32 MEANS OF EGRESS FROM PROJECTION ROOMS: At least two (2) means of egress shall be provided, equipped with three-quarter (3/4) hour self-closing fire doors, or their approved labeled equivalent, opening outwardly, not less than two and one-half (2½) feet by six (6) feet in size, unless otherwise approved by the building official.

407.33 VENTILATION OF PROJECTION ROOMS: Ventilation shall be provided by an approved mechanical system of ventilation, exhausting either directly to the outdoors or through a noncombustible flue, which shall be used for no other purpose. The exhaust capacity shall be not less than fifteen (15) cubic feet nor more than fifty (50) cubic feet per minute for each arc lamp, plus two hundred (200) cubic feet per minute for the volume of the room. The ventilation system may be extended to serve rewind rooms associated therewith, but shall not be connected in any way with ventilating or air conditioning systems serving other portions of the building. All ventilating flues shall be constructed and installed to comply with article 18. All fresh air intakes other than direct open air supply shall be protected with fire shutters arranged to operate automatically with the port shutters.

407.34 LIGHTING CONTROL: Provision shall be made for control of the auditorium lighting and the emergency lighting systems of theatres from inside of the booth and from at least one other convenient point in the building as required in section 416.8.

407.35 ELECTRICAL EQUIPMENT: Separate compartments of similar construction to the projection booth shall be provided for storage batteries and motor generators, respectively. Ventilation shall be provided for such compartments; ventilation for the motor compartment being independent of any other system. The duct from such compartments leading to outdoors shall be constructed of approved acid-resisting noncombustible material.

407.36 FILM CAPACITY: The film storage capacity of each projection or rewind room shall be not more than one hundred and twenty-five (125) pounds.

407.4 REWIND AND AUXILIARY ROOMS: Rewinding of film shall be done in the booth in accordance with the approved standards or in a special rewind room not less than eighty (80) square feet in area constructed as provided in this section for the projection room. Special auxiliary rooms may be provided for film storage of not more than one hundred and twenty-five (125) pounds capacity; but the total storage capacity of projection, rewind and auxiliary rooms shall be not more than two hundred and fifty (250) pounds.

407.41 TOILET: A toilet room with approved toilet facilities shall be connected directly with the projection booth.

407.5 TRIAL EXHIBITION ROOMS: Preview rooms shall provide a seating capacity of not more than one hundred (100) persons, with not less than two (2) approved means of egress complying with article 6. Such rooms shall be enclosed in three-quarter (3/4) hour fireresistive partitions with self-closing fire doors or their approved labeled equivalent at the openings. All seats shall be permanently fixed in position and the arrangement shall comply with the requirements of section 416.3.

407.6 TEMPORARY MOTION PICTURE INSTALLATIONS: Temporary motion picture installations shall require a building permit from the building official and shall be of approved construction.

407.7 MOTION PICTURE STUDIOS.

407.71 CONSTRUCTION: All buildings designed or used as motion picture studios shall be protected with an approved two-source automatic sprinkler system complying with the provisions of article 12; except that the building official may exempt rooms designed for housing electrical equipment from this requirement when constructed of fireproof (type 1) construction.

407.72 SPECIAL ROOMS: Rooms and spaces used as carpenter and repair shops, dressing rooms, costume and property stage rooms shall be enclosed in floors, walls and ceilings of not less than two (2) hour fireresistive construction.

407.73 TRIM, FINISH AND DECORATIVE HANGINGS: All permanently attached acoustic, insulating and light reflecting materials and temporary hangings on walls and ceilings shall comply with the requirements of article 9.

407.74 FILM STORAGE: All film shall be stored as required in section 407.2 and no surplus film shall be kept on the studio stage except loaded magazines in the cameras and sound recording apparatus. All extra loaded magazines shall be stored in a separate magazine room enclosed in two (2) hour fireresistive construction.

407.8 FILM LABORATORIES: No film laboratories shall be conducted in other than fireproof (type-A) buildings or structures, equipped throughout with an approved automatic sprinkler system.

407.9 FILM EXCHANGES: All film exchanges and depots shall be housed in buildings and structures of fireproof (type 1-A) construction equipped throughout with an approved automatic sprinkler system. All flammable film other than that in process of receipt, delivery or distribution shall be stored in vaults complying with the requirements of section 406.32.

SECTION 408.0 USE AND STORAGE OF COMBUSTIBLE FIBERS

The provisions of this section shall apply to all buildings and structures involving the storage or use of finely divided combustible vegetable or animal fibers and thin sheets or flakes of such materials involving a flash fire hazard, including among others cotton, excelsior, hemp, sisal, jute, kapok and paper and cloth in the form of scrap and clippings in excess of one thousand (1000) pounds. All such uses shall be subject to the Massachusetts State Fire Prevention Regulations, FPR-13, and the following provisions:

408.1 CONSTRUCTION REQUIREMENTS: All buildings designed for the storage of combustible fibers as herein described shall be constructed within the limits of height and area specified in table 2-6 for high hazard use (use group A) except as follows:

408.11 SPECIAL LIMITS: No single storage room or space shall be more than twelve hundred and fifty (1250) square feet in area or more than twelve thousand five hundred (12,500) cubic feet in volume unless of protected noncombustible (type 2-B) or better construction;

408.12 FLOOR LOADS: The floors of all buildings designed for the storage of combustible fibers shall not be loaded in excess of one-half (½) the safe load capacity of the floor, nor shall such materials be piled to more than two-thirds (2/3) of the clear story height;

408.13 SALVAGE DOORS: Every exterior wall shall be provided with a door to each storage compartment arranged for quick removal of the contents;

408.14 WALL OPENINGS: All openings in outside walls shall be equipped with approved fire doors and fire windows complying with article 9;

408.15 ROOF OPENINGS: All skylights, monitors and other roof openings shall be protected with galvanized wire or other approved corrosion-resistive screens with not less than thirty-six (36) meshes to the square inch or with wired glass in stationary frames;

408.16 BOILER ROOMS: All power and heating boilers and furnaces shall be located in detached boiler houses or in a segregated boiler room enclosed in three (3) hour fireresistive construction with direct entrance from the outside, except that rooms containing gas-fired heating equipment may have openings into the warehouse protected with one and one-half (1½) hour fire doors or their approved labeled equivalent.

408.2 FIRE PROTECTION: Fire-extinguishing equipment shall be provided complying with article 12 consisting of casks, pails and portable chemical extinguishers and standpipes. Where deemed necessary by the fire official, a system of outside hydrants and hose shall be provided.

408.3 OPEN STORAGE: Only temporary open storage of combustible fibers shall be permitted on the same premises with a fiber warehouse and shall be kept covered on top and sides with tarpaulins secured in place. Not more than seven thousand two hundred (7200) cubic feet of fiber shall be stored in the open; and fire-extinguishing equipment shall be provided as directed by the fire official.

408.4 SPECIAL TREATMENTS: When combustible fibers are packed in special noncombustible containers or when packed in bales covered with wrappings to prevent ready ignition, or when treated by approved chemical dipping or spraying processes to eliminate the flash fire hazard, the restictions governing combustible fibers shall not apply.

SECTION 409.0 COMBUSTIBLE DUSTS, GRAIN PROCESSING AND STORAGE

The provisions of this section shall apply to all buildings in which materials producing flammable dusts and particles which are readily ignitable and subject to explosion hazards are stored or handled, including among others, grain bleachers and elevators, malt houses, flour, feed or starch mills, wood flour manufacturing and manufacture and storage of pulverized fuel and similar uses. The applicable standards listed in the reference standards of this article, except as herein specifically required, shall be deemed to conform to the requirements of the Basic Code.

409.1 CONSTRUCTION REQUIREMENTS.

409.11 BUILDINGS: All such buildings and structures, unless herein otherwise specifically provided, shall be of fireproof (type 1), noncombustible (type 2), or of laminated planks or lumber sizes qualified for heavy timber mill (type 3-A) construction, within the height and area limits of high hazard uses (use group A) of table 2-6, except that when erected of fireproof (type 1-A) construction, the height and area of grain elevators and similar structures shall be unlimited, and when of heavy timber (type 3-A) construction, the structure may be erected to a height of sixty-five (65) feet; and except further that in isolated areas, the height of type 3-A structures may be increased to eighty-five (85) feet.

409.12 GRINDING ROOMS: Every room or space for grinding or other operations producing flammable dust shall be enclosed with floors and walls of not less than two (2) hour fireresistance when the area is not more than three thousand (3000) square feet and of not less than four (4) hour fireresistance when the area is greater than three thousand (3000) square feet.

409.13 CONVEYORS: All conveyors, chutes, piping and similar equipment passing through the enclosures of such rooms or spaces shall be constructed dirt and vapor tight, of approved noncombustible materials complying with Massachusetts State Electrical Code.

409.2 EXPLOSION RELIEF: Means for explosion relief shall be provided as specified in section 402, or such spaces shall be equipped with the equivalent mechanical ventilation complying with article 18.

409.3 GRAIN ELEVATORS: Grain elevators, malt houses and buildings for similar uses shall not be located within thirty (30) feet of interior lot lines or structures on the same lot, except when erected along a railroad right of way.

409.4 COAL POCKETS: Coal pockets located less than thirty (30) feet from interior lot lines or structures on the same lot shall be constructed of not less than protected noncombustible (type 2-A) construction. When more than thirty (30) feet from interior lot lines, or erected along a railroad right of way, such structures may be built of lumber sizes qualifying for heavy timer or laminated construction, provided they are not more than sixty-five (65) feet in height.

SECTION 410.0 PAINT AND SPRAY BOOTHS

The provisions of this section shall apply to the construction, installation and use of buildings and structures or parts thereof for the spraying of flammable paints, varnishes and lacquers or other flammable materials, mixtures or compounds used for painting, varnishing, staining of similar purposes. All such construction and equipment shall comply with the approved rules and the applicable standards listed in the reference standards of this article.

410.1 LOCATION OF SPRAYING PROCESSES: Such processes shall be conducted in a spraying space, spray booth, spray room or shall be isolated in a detached building or as otherwise approved by the building official in accordance with accepted engineering practice.

410.2 CONSTRUCTION.

410.21 SPRAY SPACES: All spray spaces shall be ventilated with an approved exhaust system to prevent the accumulation of flammable mist or vapors. When such spaces are not separately enclosed, noncombustible spray curtains shall be provided to restrict the spread of fire.

410.22 SPRAY BOOTHS: All spray booths shall be constructed of approved noncombustible materials equipped with mechanical ventilating systems.

410.23 SPRAY ROOMS: All spray rooms shall be enclosed in partitions of not less than three-quarter (3/4) hour fireresistance. Floors shall be waterproofed and drained in an approved manner. Floor drains to the building drainage system and the public sewer shall be prohibited.

410.24 STORAGE ROOMS: Spraying materials in quantities of not more than twenty (20) gallons may be stored in approved cabinets ventilated at top and bottom, when in quantities of more than twenty (20) gallons and not more than one hundred (100) gallons, they may be stored in approved double-wall noncombustible cabinets vented directly to the outer air; and all spraying materials in quantities of more than one hundred (100) gallons shall be stored in an enclosure of not less than two (2) hour fireresistance or in a separate exterior storage building. In no case shall such storage be in quantities of more than two hundred and fifty (250) gallons, except when stored in isolated storage buildings; and except further that not more than twenty-five (25) gallons of spraying material shall be stored in buildings in which exceptionally highly combustible materials are manufactured or stored.

410.3 VENTILATION OF SPRAYING PROCESSES: The ventilation system shall comply with the provisions of section 402 and shall be adequate to exhaust all vapors, fumes and residue of spraying material directly to the outer air. Fresh air shall be admitted to the spraying spaces in an amount equal to the capacity of the fan in such manner as to avoid short-circuiting the path of air in the working space and to provide air movement with a velocity of not less than one hundred (100) feet per minute at the face of the spray booth. All ducts and vents shall be constructed and installed to comply with sections 1017 and 1117 and article 18. Unless equipped with approved explosion-proof motors with nonferrous blade fans, the mechanical exhaust equipment shall be located outside of spray spaces. Make-up air shall be supplied from a point outside the spraying or dipping space such that it will be uncontaminated by the process exhaust fumes.

410.31 VENTILATING: Ventilating ducts shall run directly to the outer air and be protected with a hood against the weather. Such ducts shall not terminate within ten (10) feet horizontally of any chimney outlet, or within twenty (20) feet of any exit or any opening in an adjoining wall.

410.32 The exhaust system for any spraying, dipping or drying space shall not be connected to any other ventilating system or be discharged into a chimney or flue used for the purpose of conveying gases of combustion.

410.4 ELECTRICAL EQUIPMENT: Artificial lighting and electric equipment shall comply with section 400.5.

410.5 FIRE PROTECTION: Sprinkler heads shall be provided in all spray, dip and immersing spaces and storage rooms and shall be installed in accordance with accepted engineering practice and the standards listed in the reference section of article 12. Where buildings containing spray areas are not equipped with an approved automatic sprinkler system, the sprinkler heads in booths and other spray areas and storage rooms may be supplied from the building water supply when approved by the building official, to comply with the provisions of section 1213 for partial sprinkler systems.

SECTION 411.0 DRY CLEANING ESTABLISHMENTS

Before any dry cleaning plant is constructed or an existing plant is remodeled or altered, complete drawings shall be filed showing to scale the relative location of the dry cleaning area, the boiler room, finishing department, solvent storage tanks, pumps, washers, drying tumblers, extractors, filter traps, stills, piping and all other equipment involving the use of flammable liquid solvents. All dry cleaning by immersion and agitation shall be carried on in closed machines, installed and operated in accordance with the approved rules and the applicable standards listed in the reference standards of this article.

411.1 CLASSIFICATION: For the purpose of the Basic Code, all dry cleaning and dry dyeing establishments shall be classified as follows:

411.11 HIGH HAZARD: All such establishments shall be classified as high hazard which employ gasoline or other solvents having a flash point below seventy-five (75) degrees F. (Tag. closed-cup) in quantities of more than three (3) gallons, or more than sixty (60) gallons of flammable solvents with a flash point between seventy-five (75) and one hundred and forty (140) degrees F. (Tag. closed-cup).

411.12 MODERATE HAZARD: All such establishments employing less than three (3) gallons of volatile flammables with a flash point of less than seventy-five (75) degrees F. or less than sixty (60) gallons of solvent with a flash point between seventy-five (75) and one hundred and forty (140) degrees F. (Tag. closed-cup) shall be classified as moderate hazard.

411.13 LOW HAZARD: All such establishments using solvents of other than volatile flammable liquids or solvents with a flash point more than one hundred and forty (140) degrees F. (Tag. closed-cup) in cleaning and dyeing operations shall be classified as low hazard.

411.2 CONSTRUCTION OF DRY CLEANING PLANTS

411.21 HIGH HAZARD: The construction of new high hazard dry cleaning plants, and the installation of high hazard dry cleaning establishments in new locations shall be prohibited.

411.22 MODERATE HAZARD: Moderate hazard dry cleaning plants as herein defined may be located in buildings or structures of any type of construction other than frame (type 4) buildings subject to the fire district limitations of article 3 and the height and area limitations for high hazard buildings (use group A) of table 2-6. The room or space in which such operations are conducted shall be enclosed in not less than two (2) hour fireresistive construction with not less than two (2) means of egress from each dry cleaning or dry dyeing room or space.

411.23 LOW HAZARD: Low hazard dry cleaning plants shall not be restricted as to type of building construction within the height and area limitations for use group E of table 2-6; except that such uses shall not be located in basements nor in a building used for public assembly (use group F) or institutional (use group H) purposes.

411.24 ROOF CONSTRUCTION OF DRY CLEANING PLANTS: The roof over high hazard dry cleaning plants shall be flat without attic or concealed spaces and shall be provided with a pivot type skylight or other approved vent complying with section 402, arranged to release outwardly under explosion pressures.

411.25 FLOOR CONSTRUCTION OF DRY CLEANING PLANTS: The floor finish in high hazard dry cleaning plants shall be constructed of impervious noncombustible materials with nonsparking surfaces. There shall be no openings, vaults or pits below the floor.

411.26 EXTERIOR WALLS OF DRY CLEANING PLANTS: Exterior walls of high hazard dry cleaning plants having a fire separation of less than thirty (30) feet shall be solid masonry without openings, but in no case shall more than two (2) sides of the building be enclosed in blank walls. Opening protectives of exterior doors and windows shall have not less than three-quarter (3/4) hour fireresistance or the labeled equivalent construction, and the windows shall be pressure-releasing to comply with section 402.

411.27 BASEMENTS OF DRY CLEANING PLANTS: The basements of all buildings in which high or moderate hazard dry cleaning establishments are conducted shall be completely separated from the superstructure with unpierced floor construction of not less than two (2) hours fireresistance. The access to such basements shall be from the exterior only.

411.3 BOILER ROOM SEPARATION: Boiler rooms and heating equipment for moderate hazard dry cleaning plants shall be separated from drying room, dry cleaning and dry dyeing rooms with unpierced walls of not less than two (2) hours fireresistance; or such boiler rooms shall be located in a separate building.

411.4 VENTILATION: Mechanical ventilation systems in moderate hazard plants shall be adequate to effect ten (10) complete air changes per hour, low hazard dry cleaning establishments shall be provided with mechanical ventilation adequate to effect four (4) complete air changes per hour. Exhaust of all process fumes shall be directly to the outside air.

411.5 SOLVENT STORAGE: All volatile flammable solvents with a flash point under seventy-five (75) degrees F. (Tag. closed-cup) shall be stored underground in accordance with the provisions of section 403. Interior aboveground storage shall be permitted for solvents with a flash point above seventy-five (75) F. (Tag. closed-cup) provided the ag-

gregate quantity of such solvent in use in the system and in storage is not more than five hundred and fifty (550) gallons and the capacity of any individual tank is not more than two hundred and seventy-five (275) gallons.

411.6 ELECTRIC WIRING AND EQUIPMENT: All electrical equipment and wiring shall conform to the requirements of the Massachusetts State Electrical Code for hazardous locations; and the cylinders and shells of all washing machines, drying tumblers, drying cabinets, extractors, and all aboveground storage containers shall be grounded as therein required.

411.7 FIRE PROTECTION: Every dry cleaning room and dry dyeing room employing high and moderate hazard solvents shall be protected with a fire-extinguishing system consisting of approved automatic sprinklers, manually controlled steam-blankets, carbon dioxide flooding systems or other approved fire-extinguishing equipment.

SECTION 412.0 PRIVATE GARAGES

412.1 ATTACHED GARAGES.

412.11 ONE AND TWO-FAMILY DWELLINGS: Private garages, wherever attached or adjoining a one or two-family dwelling, shall have a fireresistance rating of not less than three-quarter (3/4) hours. The sills of any door communicating with the dwelling shall be raised at least four (4) inches above the garage floor. The doors shall be three-quarter (3/4) hour fire doors complying with article 9 or one and three-quarter (1-3/4) inch solid core wood door.

412.12 MOTELS AND MULTI-FAMILY DWELLINGS: Private garages located above or beneath motels and multi-family dwellings and in which no gasoline or oil is stored or handled shall be of protected construction of not less than two (2) hour fireresistance.

412.13 OTHER CONDITIONS: All private garages not falling within the purview of sections 412.11 and 412.12 attached to or located beneath a building shall comply with the requirements of section 413.13 for public garages.

412.2 MEANS OF EGRESS: Where living quarters are located above a private garage, required means of egress facilities shall be protected from the garage area with three-quarter (3/4) hour fireresistive construction.

SECTION 413.0 PUBLIC GARAGES

Public garages shall comply with the applicable requirements of the following sections. The portions of such buildings and structures in which gasoline, oil and similar products are dispensed shall comply

with the requirements of section 414; the portions in which motor vehicles are repaired shall comply with section 415; and the portions in which paint spraying is done shall comply with the requirements of section 410. All garages shall be subject to the provisions of FPR-4.

413.1 CONSTRUCTION: All group one (1) public garages hereafter erected shall be classified as storage buildings, moderate hazard (use group B-1) and all group two (2) public garages shall be classified as storage buildings, low hazard (use group B-2) and shall be located on the grade floor and shall comply with the requirements of section 414.

413.11 SPECIAL HEIGHT LIMITATIONS: Public garage buildings shall comply with the height and area limitations of table 2-6 for the classification of the use as specified in section 413. Such heights may be increased one (1) additional story when the building is equipped with an approved sprinkler system.

413.12 BASEMENTS: The first floor construction of public garages of all classifications and public hangars with basements shall be water and vapor proof. Where openings are provided in the floor they shall be protected by a curb or ramp not less than six (6) inches high above the floor to avoid the accumulation of explosive liquids or vapors and prevent them from spilling to the lower floor. There shall be not less than two (2) means of egress from such areas, one of which shall be directly to the outside independent of the exitways serving other areas of the building.

413.13 MIXED OCCUPANCY: No public garage shall be located within or attached to a building occupied for any other use, unless separated from such use by walls or floors complying with table 9-1 for fireresistance. Such fire division shall be continuous and unpierced by openings; except that door openings equipped with self-closing fire doors complying with article 9 shall be permitted. In buildings of single occupancy not excluding the area limitations of table 2-6 doors without fireresistance shall be permitted between the garage area and salesroom or offices that are operated in connection with the garage.

413.14 ROOF STORAGE OF MOTOR VEHICLES AND AIRPLANES: The roof of a public garage shall not be used for the parking or storage of motor vehicles unless the building is of construction type 1A, 1B, or 2A. When the roof of a building is used for parking or storage of motor vehicles, it shall be provided with a parapet wall or guard rail not less than three (3) feet six (6) inches in height and a wheel guard not less than six (6) inches in height, located so as to prevent any vehicle from striking the parapet wall or guard rail. The use of roofs for airplane storage and landing shall be subject to the approval of the Civil Aeronautics Authority.

413.15 FLOOR CONSTRUCTION AND DRAINAGE: Floors of public garages and airplane hangars shall be graded to drain through oil separators or traps to avoid accumulation of explosive vapors in building drains or sewers as provided in the Massachusetts State Plumbing Code. The floor finish shall be of concrete or other approved nonabsorbent noncombustible material.

413.2 VENTILATION: All public garages and airplane hangars shall be provided with mechanical or natural ventilation adequate to prevent the accumulation of carbon monoxide or exhaust fumes in excess of one (1) part in ten thousand (10,000) (.01 percent) explosive limit. The building official may require a test by a qualified testing laboratory to determine the adequacy. The cost of such test shall be borne by the owner. The building official may require certification of the adequacy of the system by a qualified registered professional engineer.

413.21 BELOW GRADE: Public garages below grade shall be equipped with mechanical ventilation adequate to provide the ventilation required under section 413.2. The ventilation system shall be operated at all times the garage areas are occupied by human beings.

413.22 REPAIR SHOPS OR ROOMS: Products of combustion from internal combustion engines shall be collected directly from the exhaust and discharged directly to the outside air by means of a positive induced draft. The discharge from such system shall be located so as not to create a hazard to adjoining properties, but not less than eight (8) feet above the adjacent ground level on the exterior of the building and shall discharge into a yard or court. When necessary to discharge across a walkway or private thoroughfare, the discharge opening shall be carried to a height of not less than twenty-five (25) feet above the ground level or to a distance four (4) inches above the highest point of the wall of the building or structure on which it is located.

413.23 PITS: No pits shall be installed in floors below the first; and pits in first and upper stories shall be provided with mechanical ventilation adequate to provide the ventilation required under section 413.2. The ventilation system shall be operated at all times the pits are occupied by human beings.

413.3 SPECIAL HAZARDS: Any process conducted in conjunction with public garages involving volatile flammable solvents shall be segregated or located in a detached building or structure, except as provided in section 403 for the storage and handling of gasoline and other volatile flammables. The quantity of flammable liquids stored or handled in public garages other than in underground storage and in the tanks of motor vehicles shall be not more than five (5) gallons in approved safety cans.

413.4 HEATING AND PROTECTION OF EQUIPMENT: Radiation and heating coils and pipes located within six (6) inches of the floor shall be protected with wire mesh or other approved noncombustible shields of adequate strength; and with asbestos or other insulation on top of the equipment when located in partitions or near combustible racks or woodwork.

413.5 BOILER ROOMS OF PUBLIC GARAGES: All heat generating plants other than approved direct fired heaters shall be located in separate buildings or shall be separately enclosed within the structure with solid, water and vapor tight masonry. All rooms housing boilers, stoves or other heating apparatus shall be cut off from all other parts of the building with four (4) hour fireresistive construction with entrance from outside only, and no openings through the fire division other than those necessary for heating pipes or ducts.

413.6 SPRINKLER REQUIREMENTS: For sprinkler requirements refer to article 12, table 12-3.

SECTION 414.0 MOTOR FUEL SERVICE STATIONS

414.1 CONSTRUCTION: Buildings and structures used for the storage and sale of motor fuel oils may be of all types of construction within the height and area limitations of table 2-6 for business (use group E) buildings and as modified by sections 303 and 304.0. The canopies and supports over pumps and service equipment when located less than twenty (20) feet from interior lot lines shall be constructed of approved noncombustible materials.

414.11 OPENING PROTECTIVES: All permissible openings in walls with a fire separation of less than twenty (20) feet shall be protected with approved fire windows or fire doors complying with article 9, except doors in such walls to rest rooms.

414.12 BASEMENTS: Motor fuel service stations shall have no cellars or basements; and when pits are provided they shall be vented as required in section 413.2.

414.2 GASOLINE STORAGE: All volatile flammable liquid storage tanks shall be installed below ground and vented as specified in section 403. Such tanks shall be subject to the approval of the fire official and comply with the provisions of FPR-4.

SECTION 415.0 MOTOR VEHICLE REPAIR SHOPS

All buildings and structures designed and used for repair and servicing motor vehicles, motor boats, airplanes or other motor driven means of transportation shall be subject to the limitations of tables 2-5 and 2-6 for moderate hazard storage (use group B-1). Such buildings shall be used solely for that purpose.

415.1 ENCLOSURE WALLS: Exterior walls, when located within six (6) feet of interior lot lines or other buildings shall have no openings therein.

415.2 VENTILATION: All rooms and spaces used for motor vehicle repair shop purposes shall be provided with an approved system of mechanical ventilation providing at least four (4) air changes per hour and meeting the requirements of section 413.2 and article 18.

415.3 FIRE PREVENTION: No open gas flames except heating devices complying with section 413.5, torches, welding apparatus, or other equipment likely to create an open flame, or spark shall be located in a room or space in which flammable liquids or highly combustible materials are used or stored.

SECTION 416.0 PLACES OF PUBLIC ASSEMBLY

The provisions of this section shall apply to all places of public assembly and all parts of buildings and structures classified in the use group F-1, theatres and in other places of public assembly, use groups F-2, F-3, and F-4, except as specifically exempted in section 417.

416.1 RESTRICTIONS.

416.11 HIGH HAZARD USES: No place of public assembly shall be permitted in a building classified in the high hazard group (use group A).

416.12 FRAME CONSTRUCTION: No theatre with stage, fly gallery and rigging loft shall be permitted in a building of frame (type A) construction.

416.13 LOCATION: All buildings used for assembly purposes shall front on at least one (1) street in which the main entrance and exitway discharge shall be located. The main exitway shall be adequate to accommodate one-third (1/3) the total occupant load, but in any case, the capacity of the main exitway shall be adequate to provide for the total capacity of all exitway elements which lead to the main exitway.

416.14 TRIM, FINISH AND DECORATIVE HANGINGS: All permanent acoustic, insulating and similar materials and temporary hangings shall comply with the flameresistance requirements of article 9. Moldings and decorations around the proscenium openings shall be constructed entirely of noncombustible material.

416.15 EXISTING BUILDINGS: Nothing herein contained shall prohibit the alteration of a building heretofore occupied as a place of public assembly for such continued use provided the occupancy load is not

increased and seats, aisles, passageways, balconies, stages, appurtenant rooms and all special permanent equipment comply with the requirements of this article.

416.16 NEW BUILDINGS: No building not heretofore occupied as a place of public assembly shall hereafter be altered to be so occupied unless it is made to comply with all the provisions of this article.

416.2 THEATRE MEANS OF EGRESS REQUIREMENTS.

416.21 TYPES OF EXITWAYS: The required exitways from every tier or floor of a theatre shall consist of grade exitway discharge doors, interior or exterior stairways or horizontal exits which provide direct access to a street, an exitway discharge court, or unobstructed passageway, hallway or lobby leading to a street or open public space. The number, location and construction of all means of egress facilities shall comply with the requirements of article 6 and the provisions of this section.

416.22 NUMBER OF STAIRWAYS IN AUDITORIUM: Each tier above the main floor of a theatre or other auditorium shall be provided with at least two (2) interior enclosed stairways which shall be loacted on opposite sides of the structure with the following exception: stairs serving the first balcony only or mezzanine thereunder shall not require enclosures; however, such stairs shall discharge to a lobby on the main floor. Exitway stairways serving galleries above the balcony shall lead directly to the street or open public space as provided in section 416.21.

416.23 EMERGENCY MEANS OF EGRESS FROM MAIN FLOOR OF AUDITORIUM: In addition to the main floor entrance and exitway, emergency exitway discharge doors shall be provided on both sides of the auditorium which lead directly to a street, or through an exterior passageway to the street independent of other exitways, or to an exitway discharge court as defined in this Code.

416.24 EMERGENCY MEANS OF EGRESS FROM BALCONIES AND GALLERIES: Emergency exitways shall be provided from both sides of each balcony and gallery with direct egress to the street, or to an independent passageway, or to an exitway discharge court. There shall be no communication from any portion of the building to the emergency exitway stairways except from the tier for which such exitway is exclusively intended.

416.25 EXITWAY DISCHARGE COURTS: All exitway discharge courts shall be not less than six (6) feet wide for the first six hundred (600) persons to be accommodated or fraction thereof, and shall be increased one (1) foot in width for each additional two hundred and fifty (250) persons. Such courts shall extend sufficiently in length to include the side and rear emergency exitways from the auditorium.

416.26 HARDWARE: Refer to section 612.42 for requirements.

416.27 EXITWAY DOORWAY WIDTHS: The maximum width of single exitway doorways shall be forty-two (42) inches and the minimum width of double doorways shall be sixty-six (66) inches.

416.28 "EXIT" LIGHTS: All exitway doors shall be marked with illuminated "Exit" signs complying with section 624 which shall be kept lighted at all times during occupancy of the building.

416.3 THEATRE SEATINGS.

416.31 FIXED SEATS: In all theatres and similar places of assembly except churches, stadiums and reviewing stands, individual fixed seats shall be provided with an average width of not less than thirty-two (32) inches apart, back to back, measured horizontally. The clear unobstructed distance which can be provided for passage between rows of seats shall be twelve (12) inches.

416.32 NUMBER OF SEATS: Aisles shall be provided so that not more than seven (7) seats intervene between any seat and the aisle or aisles, except that the number of seats in a row shall not be limited when self-raising seats are provided which leave an unobstructed passage between rows of seats of not less than eighteen (18) inches in width leading to side aisle in which exitway doorways are located at not more than twenty-five (25) foot intervals to the exitway corridor or exitway discharge court.

416.33 BOX SEATS: In boxes or loges with level floors, the seats need not be fastened when not more than fourteen (14) in number.

416.34 WHEELCHAIR FACILITIES: Facilities shall be provided for the handicapped according to the provisions of the reference standards of this article.

416.4 THEATRE AISLES.

416.41 LONGITUDINAL AISLES: The width of longitudinal aisles at right angles to rows of seats and with seats on both sides of the aisle shall be not less than forty-two (42) inches. The width of the longitudinal aisles with banks of seats on one (1) side only shall be not less than twenty-four (24) inches.

416.42 CROSS AISLES: When there are twenty-seven (27) or more rows of seats on the main floor of theatres, cross aisles shall be provided so that no block of seats shall have more than twenty-two (22) rows. The width of cross aisles shall be not less than the widest aisle with which they connect or the width of exitway which they serve; but no cross aisle shall be less than forty-two (42) inches wide, or when bordering on means of entrance not less than forty-eight (48) inches wide. In balconies and galleries of theatres, one or more cross aisles shall be provided when there are more than ten (10) rows of seats.

416.43 GRADIENT: Aisles shall not exceed a gradient of one and three-quarters (1-3/4) inches per foot except where subject to requirements for use of handicapped. No aisles or the main floor may be stepped.

416.44 BALCONY STEPS: Steps may be provided in balconies and galleries only, and such steps shall extend the full width of the aisle with treads and risers complying with article 6, which shall be illuminated by lights on both sides or by a step light or otherwise to insure an intensity of not less than one (1) foot candle.

416.45 RAILINGS: Metal or other approved noncombustible railings shall be provided on balconies and galleries as herein prescribed:

At the facia of boxes, balconies and galleries not less than thirty (30) inches in height; and not less than thirty-six (36) inches in height at the foot of steps;

Along cross aisles not less than twenty-six (26) inches in height except where the backs of the seats along the front of the aisle project twenty-four (24) inches or more above the floor of the aisle;

Where seatings are arranged in successive tiers, and the height of rise between platforms exceeds eighteen (18) inches, not less than twenty-six (26) inches in height along the entire row of seats at the edge of the platform.

416.5 THEATRE FOYERS.

416.51 CAPACITY: In every theatre or similar place of public assembly, not including churches, for theatrical use with stage and scenery loft, a foyer or lobby shall be provided with a net floor area, exclusive of stairs or landings, of not less than one and one-half (1½) square feet for each occupant having access thereto. The use of foyers and lobbies and other available spaces for harboring occupants until seats become available shall not encroach upon the clear floor area herein prescribed or upon the required clear width of front exitways.

416.52 EGRESS: When the foyer is not directly connected to the public street through the main lobby, an unobstructed corridor or passage shall be provided which leads to and equals in minimum width the required width of main entrances and exitways.

416.53 GRADIENT: The rear foyer shall be at the same level as the back of the auditorium and the exitways leading therefrom shall not have a steeper gradiwnt than one (1) foot in ten (10) feet.

416.54 CONSTRUCTION: The partitions separating the foyer from the auditorium and other adjoining rooms and spaces of theatres shall

be constructed of not less than two (2) hour fireresistance; except that opening protectives may be constructed of noncombustible materials without fireresistance rating.

416.55 WAITING SPACES: Waiting spaces for harboring occupants shall be located only on the first or auditorium floor. Additional capacity of exitway shall be provided for the waiting space occupancy based on an allowance of three (3) square feet for each person.

416.6 THEATRE STAGE CONSTRUCTION.

416.61 STAGE ENCLOSURE WALLS: Every stage hereafter erected or altered for theatrical performances which is equipped with portable or fixed scenery, lights and mechanical appliances, shall be enclosed on all sides with solid walls of not less than four (4) hour fireresistance, extending continuously from foundation to at least four (4) feet above the roof. There shall be no window opening in such walls within six (6) feet of an interior lot line; and all permissible window openings shall be protected with three-quarter (3/4) hour fire windows complying with article 9.

416.62 FLOOR CONSTRUCTION: The entire stage, except that portion used for the working of scenery, traps, and other mechanical apparatus for the presentation of the scene, shall be not less than three (3) hour fireresistive construction. All openings through the stage floor shall be equipped with tight-fitting, solid wood trap doors not less than three (3) inches in thickness or other materials of equal physical and fireresistive properties.

416.63 ROOF AND RIGGING LOFT: The roof over the stage shall be of not less than three (3) hour fireresistive construction. The rigging loft, fly galleries and pin rails shall be constructed of approved noncombustible materials.

416.64 FOOTLIGHTS AND STAGE ELECTRICAL EQUIPMENT: Footlights and border lights shall be installed in troughs constructed of noncombustible materials. All electrical equipment shall conform to the requirements of Massachusetts State Electrical Code, and the switchboard shall be readily accessible and protected from any potential damage.

416.65 STAGE, MEANS OF EGRESS: There shall be provided at least one (1) approved means of egress from each side of the stage leading to an approved discharge area.

416.66 PROSCENIUM WALL: There shall be no other openings in the wall separating the stage from the auditorium except the main proscenium opening; two (2) doorways at the stage level, one (1) on each side thereof; and, where necessary, not more than two (2) doorways to the musicians' pit from the space below the stage floor. Each such doorway shall not exceed twenty-one (21) square feet in area and

shall be protected with approved automatic and self-closing fire door assemblies complying with article 9 with a combined fireresistance rating of three (3) hours or the approved labeled equivalent.

416.67 PROSCENIUM CURTAIN: Where required, the proscenium opening shall be protected with an approved automatic fireresistive and smoke-tight curtain, or its approved equivalent, designed to resist an air pressure of not less than ten (10) pounds per square foot normal to its surface, both inward and outward. The curtain shall withstand a one-half (½) hour fire test at a temperature of not less than seventeen hundred (1700) degrees F. without the passage of flame. The curtain shall be operated by an automatic heat-activated device to descend instantly and safely and to completely close the proscenium opening at a rate of temperature rise of fifteen (15) to twenty (20) degrees F. per minute, and by an auxiliary operating device to permit prompt and immediate manual closing of the proscenium opening.

416.68 STAGE VENTILATION: Metal or other approved noncombustible ventilators, equipped with movable shutters or sash shall be provided over the stage, constructed to open automatically and instantly by approved heat-activated devices, with an aggregate clear area of opening not less than one-eighth (1/8) the area of the stage. Supplemental means shall be provided for manual operation of the ventilator.

416.7 DRESSING AND APPURTENANT ROOMS.

416.71 CONSTRUCTION: Dressing rooms, scene docks, property rooms, work shops and store rooms and all compartments appurtenant to the stage shall be of fireproof (type 1) construction and shall be separated from the stage and all other parts of the building by walls of not less than three (3) hour fireresistance. No such rooms shall be placed immediately over or under the operating stage area.

416.72 OPENING PROTECTIVES: No openings other than to trunk rooms and the necessary doorways at stage level shall connect such rooms with the stage and such openings shall be protected with one and one-half (1½) hour self-closing fire doors or the approved labeled equivalent complying with article 9.

416.73 INTERIOR TRIM: All shelving and closets in dressing rooms, property rooms or storage rooms shall be constructed of flameresistant materials complying with article 9.

416.74 DRESSING ROOM AND STAGE EXITWAYS: Each tier of dressing rooms shall be provided with at least two (2) means of egress, one of which shall lead directly to an exitway corridor, exitway discharge court or street. Exitway stairways from dressing and storage rooms may be unenclosed in the stage area behind the proscenium wall. At least one approved exitway shall be provided from each side of the stage and from each side of the space under the stage, and from

each fly gallery and from the gridiron to a street, exitway discharge court or passageway to a street. An iron ladder shall be provided from the gridiron to a scuttle in the stage roof.

416.8 LIGHTING.

416.81 EXITWAYS: During occupancy all exitways in places of assembly shall be lighted to comply with the requirements of section 624.

416.82 AUDITORIUMS: Aisles in auditoriums shall be provided with general illumination of not less than one-tenth (1/10) foot candles at the front row of seats and not less than two-tenths (2/10) foot candles at the last row of seats and the illumination shall be maintained throughout the showing of motion pictures or other projections.

416.821 FOYERS AND WAITING SPACES: Foyers and waiting spaces shall be artificially lighted by electrical means at all times during occupancy of a place of assembly so as to provide all illumination of at least five (5) foot candles at the level of the floor and on the surface of all stairs, steps, ramps, and escalators within the foyers and waiting spaces.

416.822 OPEN EXTERIOR SPACES: Yards or courts which serve as open exterior spaces shall be artificially lighted by electrical means at all times between sunset and sunrise during occupancy of a place of assembly so as to provide illumination of at least five (5) foot candles at the level of the floor over at least the required area.

416.83 OTHER PLACES OF PUBLIC ASSEMBLY: All areas and portions of buildings used as places of public assembly other than theatres shall be lighted by electric light to provide a general illumination of not less than one (1) foot candle.

416.84 CONTROL: The lighting of exitways, aisles and auditoriums shall be controlled from a location inaccessible to unauthorized persons. Supplementary control shall be provided as specified in section 407.34 in the motion picture projection room.

416.85 EMERGENCY LIGHTING: In all theatre buildings and similar structures used for public assembly purposes, all exitways shall be lighted by means of electricity so arranged and controlled that the interruption of service on any other circuit inside the building or structure will not interrupt the required exitway lighting, including corridors, stairways, foyers, and lobbies.

416.9 FIRE PROTECTION AND FIRE FIGHTING EQUIPMENT: Every theatre classified in the F-1 use group shall be equipped with fire-extinguishing equipment complying with the requirements of article 12 and as herein specified.

416.91 SPRINKLER SYSTEM: Approved automatic sprinkler systems complying with the provisions of sections 1212 and 1213 shall be provided to protect all parts of the building except the auditorium, foyers and lobbies or in the immediate vicinity of automatic equipment or over dynamos and electric equipment. Such protection shall be provided over the stage, under the gridiron, under all fly galleries, in dressing rooms over the proscenium opening on the stage side, under the stage, in all basements, cellars, work rooms, store rooms, property rooms and in toilet, lounge, and smoking rooms.

416.92 STANDPIPES: Standpipe fire lines complying with the provisions of sections 1206 and 1207 shall be provided with outlets and hose attachments one on each side of the auditorium in each tier; one in each mezzanine; one in each tier of dressing rooms; and protecting each property, store and work room.

416.93 FIRST-AID STANDPIPES: First-aid standpipes complying with the provisions of section 1209 shall be provided on each side of the stage. Such standpipes shall be not less than two and one-half (2½) inches in diameter, equipped with one and one-half (1½) inch hose and three-eighth (3/8) inch nozzles.

416.94 HOSE OUTLETS: A sufficient quantity of hose shall be provided, equipped with regulation fire department couplings, nozzle and hose spanner, to reach all areas as specified in article 12.

416.95 FIRST-AID HAND EQUIPMENT: Approved portable two and one-half (2½) gallon fire extinguishers shall be provided and located as follows: two (2) on each tier on floor of the stage; one (1) immediately outside of the motion picture projection room; one (1) in each dressing room; and one (1) in each work, utility and storage room. Fire axes and fire hooks shall also be provided as directed by the fire official; and all fire extinguishers and fire tools shall be securely mounted on walls in plain view and readily accessible.

SECTION 417.0 PUBLIC ASSEMBLY OTHER THAN THEATRES

Other places of public assembly including auditoriums, armories, bowling alleys, broadcasting studios, chapels, community houses, dance halls, gymnasiums, lecture halls, museums, exhibition halls, night clubs, restaurants, rinks, roof gardens and similar occupancies and uses shall comply with the general exitway requirements of article 6 and the applicable requirements of section 416, except the provisions of sections 416.45 and 416.54 or as herein specifically exempted. Places of public assembly which are equipped with a stage, movable scenery, scenery loft and dressing rooms shall comply with all the requirements of section 418, except use groups F-1 theatres.

417.1 NUMBER OF EXITWAYS: Every tier, floor level and story of places of public assembly other than theatres, shall be provided with the number of required exitways herein specified of not less than the required width complying with article 6 for the occupancy load. The required exitways shall be remote and independent of each other and located on opposite sides of the area served thereby.

Occupancy Load Per Floor	Minimum Number of Exitways
Not more than 500	2
501 to 900	3
901 to 1800	4
Over 1800	5

417.2 AISLES WITH FIXED SEATS: All rows of seats shall be individually fixed or fixed in rigid units between longitudinal aisles complying with section 416.32 and 416.4 except as provided for chapels and churches in section 610.3. Where permitted, continuous fixed benches shall comply with the provisions of section 421.7.

417.3 AISLES WITHOUT FIXED SEATS: Tables and chairs in all rooms and spaces for public assembly shall provide convenient access by unobstructed aisles not less than thirty-six (36) inches wide which lead to required exitways complying with article 6.

417.4 KITCHEN AND SERVICE PANTRIES: Where kitchen and service pantries are provided, they shall be separately enclosed in partitions, floors and ceilings of not less than three-quarter (3/4) hour fireresistance, except for opening protectives; and no required element of exitway shall pass through such areas.

417.5 BOWLING ALLEYS: The storage and use of all volatile flammable liquids shall comply with section 403 and the finishing rooms shall be separately enclosed in two (2) hour fireresistive construction with floor finish of concrete or other noncombustible, nonabsorbent material.

417.6 SKATING RINKS: No skating rinks shall be located below the floor nearest grade.

SECTION 418.0 AMUSEMENT PARKS

All buildings and structures used as part of an amusement park shall be subject to the provisions of this Code as applicable. Unusual buildings, structures or devices which require a building permit by the provisions of this Code but are beyond the normal scope of applicability of this Code shall be subject to the provisions of section 128.0 and shall be considered to be within those categories of structures listed in section 128.1 as subject to control.

418.1 TEMPORARY AMUSEMENT FACILITIES AND DEVICES: Any moving structure or structure with any moving parts, and any structure, which in the opinion of the local building official, may represent a potential danger or hazard, shall have an affadavit submitted by a qualified registered professional engineer that the structure as designed and constructed is safe for its intended use and he shall provide certification that the structure has been inspected by a qualified registered professional engineer within six (6) months and meets all the requirements necessary to operate safely according to its design use. Furthermore, a qualified registered professional engineer shall be responsible for direction of the erection of such structures and shall certify that they have been erected in compliance with their design requirements. Any such structure, which is to accommodate human use in any way, shall be certified for the number of persons for which it is designed or as may be allowed by the local building official.

SECTON 419.0 STADIUMS AND GRANDSTANDS

Stadiums and grandstands shall be constructed as required by this Code and in accordance with the approved rules and the Standard for Tents and Grandstands Used for Places of Assembly (NFPA 102) listed in the reference standards of this article.

419.1 RAILS: Every ramp, stairway, deck and tier shall have an approved protective railing or guard not less than three (3) feet six (6) inches high on all open sides when three (3) feet or more above grade level or above any other level occupied by the public. Front railings of grandstands when the foot rest is more than two (2) feet above the ground shall be not less than thirty-three (33) inches high.

419.2 SPACES UNDERNEATH SEATS: Spaces underneath grandstand seats shall be kept free of all combustible and flammable materials and shall not be occupied or used for other than exitways; except that when enclosed in not less than three-quarter (3/4) hour fireresistive construction, the building official may approve the use of such spaces for other purposes that do not endanger the safety of the public.

SECTION 420.0 TENTS AND OTHER TEMPORARY STRUCTURES

Tents shall be constructed as required by this Code and in accordance with accepted engineering practice and the Standard for Tents, Grandstands and Air-Supported Structures Used for Places of Assembly (NFPA 102) listed in the reference standards of this article.

420.1 CONDITIONS OF PERMIT AND LOCATION: Tents and other temporary structures may be erected for a period as determined by the building official. Such structures may not be erected within the fire district

for a period of more than twenty-four (24) hours unless such use is reviewed and approved by the fire official, and any such structure erected within the fire district shall be subject to any condition of use and protection as may be determined by the building official.

420.2 TENT CONSTRUCTION: Tents and other temporary structures shall be of an approved type and shall have evidence submitted that the structure satisfies all structural and fire-safety requirements.

420.3 COMBUSTIBLE MATERIALS: No combustible materials shall be permitted under stands or seats at any time. Excessive vegetation shall not be allowed beneath the stands or seats.

SECTION 421.0 RADIO AND TELEVISION TOWERS

Commercial radio and television towers shall have complete structural drawings and specifications submitted by a qualified registered professional engineer, bearing his seal and signature.

SECTION 422.0 SWIMMING POOLS

422.1 GENERAL: Pools used for swimming or bathing shall be in conformity with the requirements of this section; provided, however, these regulations shall not be applicable to any such pool less than twenty-four (24) inches deep or having a surface area less than two-hundred and fifty (250) square feet. For purposes of this Code, pools are classified as private swimming pools or public swimming pools, as defined in section 422.2.

422.2 CLASSIFICATION OF POOLS: Any pool intended to be used primarily for swimming and designated as being a private pool for the use only of the occupants of a one- or two-family dwelling shall be designated a private pool. Any pool intended to be used primarily for swimming which is not a private pool as defined above shall be classified as a public pool.

422.3 PLANS AND PERMIT.

422.31 PERMITS: No swimming pool subject to the provisions of this Code shall be constructed, installed, enlarged, or altered until a building permit has been obtained from the building official.

422.32 PLANS AND SPECIFICATIONS: The application for the permit shall be accompanied by copies of the specifications and plans drawn to scale. The plans shall accurately show dimensions and construction of the pool including vertical elevations and sections showing depth in sufficient clarity to clearly indicate the nature of the structure and show all details necessary for conformance with the provisions of this Code. All plans for public pools must be submitted with the seal and signature of a qualified registered professional engineer.

422.4 DESIGN AND CONSTRUCTION.

422.41 GENERAL: Pools shall be constructed so as to be water tight and easily cleaned. They shall provide safe and easy means of egress.

422.42 STRUCTURAL DESIGN: The pool structure shall be engineered and designed in conformance with the normal engineering practices and subject to all the provisions of this Code.

422.43 WALL SLOPES: In public swimming pools, which are designed and constructed subject to the provisions of this Code, the side and end walls shall be vertical and shall have a safety ledge at the deep end of the pool, located at a level four (4) feet six (6) inches below the surface of the water. Safety ledges shall be four (4) inches wide.

422.44 FLOOR SLOPES: In public pools, the slope of the floor on the shallow side of the transition point between shallow and deep water shall not be more than five (5) feet deep.

422.45 SURFACE CLEANING: All swimming pools shall be provided with a recirculating skimming device or overflow gutters to remove scum and foreign matter from the surface of the water in conformance with Article VI of the Commonwealth of Massachusetts, Department of Public Health Sanitary Code.

422.46 WALKWAYS: All public swimming pools shall have walkways not less than four (4) feet in width extending entirely around the pool. Where curbs or sidewalks are used around any swimming pool, they shall have a nonslip surface for a width of not less than one (1) foot at the edge of the pool and shall be so arranged to prevent return of surface water to the pool.

422.47 STEPS AND LADDERS: At least one (1) approved means of egress must be provided in any pool constructed subject to the provisions of this Code. Steps must be nonskid and have the following requirements: Width ten (10) inches minimum, area two hundred and forty (240) square inches minimum, risers twelve (12) inches maximum.

In public pools, step holes inserted in the pool wall shall not be accepted as a required means of egress. All steps and ladders shall have handrails on both sides extending onto the deck surface adjacent to the pool. Handrails are not required in private pools where there are four steps or fewer.

In public pools, approved means of egress must be provided for a maximum of seventy-five (75) feet of pool perimeter wherever the height from the bottom of the pool to the ledge or top of the wall exceeds twelve (12) inches.

422.5 WATER SUPPLY, TREATMENT AND DRAINAGE SYSTEMS: All water supply, treatment and drainage systems shall conform to the requirements of Article VI of the Commonwealth of Massachusetts, Department of Public Health Sanitary Code.

422.6 APPURTENANT STRUCTURES

422.61 APPURTENANT STRUCTURES: All appurtenant structures, installations, and equipment; such as showers, dressing rooms, equipment houses or other buildings and structures, including plumbing, heating, and air conditioning, amongst others appurtenant to a swimming pool, shall comply with all applicable requirements of the Basic Code, the Massachusetts State Plumbing Code, the Massachusetts State Electrical Code, and Article VI of the Commonwealth of Massachusetts, Department of Public Health Sanitary Code.

422.62 ACCESSORIES: All swimming pool accessories shall be designed, constructed, and installed so as not to be a safety hazard. Installations or structures for diving purposes shall be properly anchored to insure stability, and properly designed and located for maximum safety.

422.7 SAFETY PRECAUTIONS.

422.71 ELECTRICAL SAFETY: The construction and installation of electrical wiring for equipment in or adjacent to swimming pools, to metalic appurtenances in or within five (5) feet of the pool, and to auxiliary equipment such as pumps, filters, and similar equipment shall conform to article 680 of the Massachusetts State Electrical Code.

422.72 EQUIPMENT INSTALLATIONS: Pumps, filters, and other mechanical and electrical equipment for public and semi-public swimming pools shall be enclosed in such a manner as to be accessible only to authorized persons and not to bathers. Construction and drainage shall be such as to avoid the entrance and accumulation of water in the vicinity of electrical equipment.

422.8 GENERAL SAFETY REQUIREMENTS: Any public swimming pool shall be enclosed by an impassible four (4) foot high fence with a self-latching gate or an equivalent enclosure or means of protection from access to the pool.

SECTION 423.0 OPEN PARKING STRUCTURES

Opening parking structures shall be subject to the provisions of this section, Massachusetts State Fire Prevention Regulation, FPR-4 and NFPA 88 such that those regulations which provide for the greatest public safety shall apply in any case. In addition, where applicable, sections 414, 415 and 410 of this Code shall apply.

423.1 GENERAL REQUIREMENTS: Open Structures for the parking of passenger motor vehicles shall be constructed of noncombustible materials throughout, including structural framing, floors, roofs and walls.

423.11 VEHICLE CAPACITY: Open passenger vehicle parking structures are those structures used for the parking or storage of passenger motor vehicles designed to carry not more than nine (9) persons.

423.12 RAMP TYPE STRUCTURES: Ramp type parking structures are those employing a series of continuously rising floors or a series of interconnecting ramps between floors permitting the movement of passenger automobiles under their own power to and from the street level.

423.13 MECHANICAL TYPE PARKING STRUCTURES: Mechanical type parking structures employ specially designed parking machines, elevators, lifts, conveyors, moving cranes, dollies, or other devices for moving passenger vehicles to and from the street level.

423.2 SEPARATIONS: Parking structures may be erected without enclosure walls with the following exception: when located within fifteen (15) feet of interior lot lines a noncombustible enclosure wall of two (2) hours fireresistance rating with no openings is required.

423.3 MEANS OF EGRESS: Refer to Section 609.3.

423.4 BASEMENTS: Basements, if used for parking vehicles, shall be sprinklered in accordance with article 12, and shall comply with the ventilation requirements of Section 415.12.

423.5 HEIGHTS AND AREAS: Heights and areas of open parking structures shall not exceed the limits in the following table and shall be subject to the limitations of the Massachusetts State Fire Prevention Regulations, FPR-4 as applicable.

TABLE 4-4 HEIGHT AND LIMITATION FOR OPEN PARKING STRUCTURES

Type of Construction	Maximum Allowable Height		Allowable Area per parking Tier (sq. ft.)
	Stories	Feet	
1A	Unlimited	Unlimited	Unlimited
1B	Unlimited	Unlimited	Unlimited
2A		100	50,000
2B		100	50,000
2C	2	25	30,000

423.51 UNLIMITED AREA: The area of an open parking structure having not more than two (2) tiers above grade shall not be limited.

423.52 STREET FRONTAGE INCREASE: The areas of open parking structures shall be subject to the provisions of Section 308.1.

423.6 CURBS AND BUMPERS: Curbs or bumpers of noncombustible materials shall be provided at the perimeter of each parking tier. Such curbs or bumpers shall be at least twelve (12) inches high, substantially anchored, and so located that no part of any motor vehicle will contact a wall, partition or railing.

423.7 RAILINGS: Substantial railings or protective guards of non-combustible materials shall be provided at the perimeter of all parking tiers; except where exterior walls are provided, and around all interior floor openings. Such railings or guards shall be at least three (3) feet six (6) inches high, and shall be designed in accordance with the requirements of article 7.

423.8 FLOOR OPENINGS: Floor openings shall be protected by enclosure barriers at least six (6) inches high.

SECTION 424.0 GROUP RESIDENCE IN THE COMMONWEALTH OF MASSACHUSETTS

424.1 DEFINITION: A premise, licensed or operated by an agency of the Commonwealth of Massachusetts for the residential care in any single building of not more than twelve (12) unrelated persons between the ages of seven (7) and fifteen (15) inclusive, or up to twenty-five (25) unrelated persons sixteen (16) years of age or over, as may be approved by the licensing or operating state agency, who are capable of self-preservation. The use of such accommodations provided for a group residence as defined herein shall be considered the same as a normal single-family residence for the purpose of these regulations and shall not be construed as being similar to a boarding house, lodging house or dormitory. These provisions will apply to group residence uses providing accommodations for the care of not more than twenty-five (25) individuals.

424.2 NEW AND EXISTING OCCUPANCIES: These regulations apply to existing buildings, which are to be used as group residences as defined in section 424.1 of this Code, and to buildings and/or structures hereinafter erected or altered, which are to be used as group residences as defined in section 424.1 of this Code.

424.21 PLANS AND SPECIFICATIONS: Any existing building whose occupancy is altered for use as a group residency under the provisions of section 424.0 shall have filed with the local building department a complete set of plans showing in detail all rooms, doors, corridors, windows, stairs and stairways, hazard vertical openings (section 424.51), and the location of all fire detection equipment, alarms, and fire suppression equipment.

424.3 HAZARD OF CONTENTS: Any household contents, which represent a fire hazard greater than that which could be expected of ordinary household furnishings, shall not be allowed.

424.4 MEANS OF EGRESS: A means of egress shall be a continous path of travel from any point in a building to the open air outside at ground level.

424.41 PRINCIPAL MEANS OF EGRESS: There shall be a principal means of egress normally used by the occupants to leave the building. Under fire conditions this exit would be the first choice for exiting.

424.42 ESCAPE ROUTE: There shall be a back-up, or escape route, available to each occupant from any occupied portion of the building to preclude any possibility of entrapment in the event that the principal means of egress is blocked by fire, smoke or structural collapse. This escape route shall be so determined as to minimize the likelihood that it can be deliberately compromised.

424.43 TIME FOR EGRESS: The time taken to accomplish total evacuation of the building shall not exceed one (1) minute per floor, with a maximum time of two and one-half (2½) minutes as determined by and to the satisfaction of the licensing agency in accordance with Section 9.1 of 9 CHSR S. 51 Title 9 Code of Human Services Regulations, promulgated by the Executive Office of Human Services of the Commonwealth of Massachusetts.

424.44 REQUIREMENTS FOR EGRESS AND ESCAPE ROUTES: All main egress doors must swing in the anticipated direction of egress or escape where practicable.

424.5 FIRE PROTECTION FEATURES.

424.51 HAZARDOUS VERTICAL OPENINGS: Hazardous Vertical Openings such as laundry chutes, dumb waiters, heating plenums or combustible concealed spaces shall be enclosed or protected with a minimum of three-eights (3/8) inch gypsum sheet rock on the side of the expected exposure to delay the spread of fire and smoke. Automatic detection systems as specified in Section 6 shall be provided in each space.

424.52 SMOKE SCREENS: For the purposes of this Code a solid bonded core smokestop wood door with an automatic closer will be acceptable as a divider in providing two noncrossing, independent, egress routes.

424.53 INTERIOR FINISH: Only Class A and B Interior Finishes shall be permitted in the principal means of egress (to flame spread of seventy-five (75)). In the refinishing of any area, materials with a flame spread rating in excess of two hundred (200) are not allowed.

424.6 ALARM DETECTION SYSTEM: An approved automatic fire/smoke detector system and alarm system shall be provided.

424.61 TYPES AND LOCATIONS OF DETECTORS:

TYPE	LOCATION
Products of Combustion	Principal means of egress on each floor.
Smoke Detectors	Living-Dining-Recreation Areas.
Rate of Rise Detectors	Boiler Room-Kitchen-Bedroom.
Fixed Temperature Detectors	Closets and vent shafts, and concealed spaces.

424.62 TYPES AND LOCATIONS OF ALARMS:

TYPE	LOCATION
Manual Sending	Each exit of principal means of egress.*
Manual Sending	One outdoor alarm of a type acceptable to local Fire Departments; maximum two hundred (200) feet from building.*
Automatic Connection to Manual	From each detector.

*To municipal fire department as well, wherein practicable.

424.63 ALARM SOUNDING AND VISIBLE DEVICES: Alarm sounding devices shall be provided of such character and so distributed as to be effectively heard in every room above all other sounds. Visible alarm devices may be used only in conjunction with an approved back-up system, and where specifically approved.

Every alarm sounding device shall be distinctive in pitch and quality from all other sounding devices.

424.64 MAINTENANCE AND SUPERVISION: Each detector (or system) and alarm shall be provided with a signal (either visible or audible) to indicate when it is not capable of functioning according to its designed purpose; and shall be periodically inspected and certified by the licensing agency. The entire electrical alarm and detector system circuit shall be designed so that the disruption of any part of the continuous circuit will set off an alarm.

424.7 FIRE FIGHTING EQUIPMENT: Manually operated fire-fighting equipment such as hand extinguishers, shall be available to the custodian and other designated personnel.

424.8 INSPECTION: Inspections shall be made frequently by authorized inspectors to insure conformance with this Code. The results of such inspections shall be reported to the licensing agency on a prepared checklist and signed by the authorized inspector.

424.9 FINAL CERTIFICATION OF OCCUPANT: After preliminary certification by those qualified certifying personnel as specified in 9 CHSR S.51 Title 9 Code of Human Services Regulations, Section 51, each occupant must be certified at regular intervals but not less than once every quarter at the place of proposed residency by the licensing agency.

SECTION 425.0 COVERED MALLS

Covered malls shall be constructed in accordance with one of the following options:

425.1 OPTION 1: The covered mall and all buildings connected thereto shall be treated as a single building and shall be subject to the provisions of this Code for the specific use group and type of construction;

425.2 OPTION 2: The mall may be considered to be an accessible unoccupied open space that separates the construction into one or more buildings if the following requirements are met:

a) the covered mall shall be at least thirty (30) feet in width.

b) the least, unobstructed, horizontal dimension at any place in the covered mall shall be ten (10) feet.

c) combustible kiosks or other similar structures shall not be located within the covered mall.

d) kiosks or similar areas (temporary or permanent) located within the covered mall shall be provided with approved fire suppression and detection devices as required by the building official.

e) the minimum horizontal separation between kiosks and similar areas and buildings connected to the covered mall shall be twenty (20 feet.

f) the covered mall shall be of noncombustible or type 3A construction.

g) the covered mall and all buildings connected thereto shall be provided throughout with an approved fire suppression system. The suppression system in the covered mall shall be independent of the suppression systems in the buildings connected to the covered mall.

h) multi-level covered malls shall be sufficiently open, so that a hazardous condition occurring on one level will be readily visible to occupants on all levels.

i) floor-ceiling assemblies and their supporting columns and beams within multi-level covered malls shall be of one (1) hour fire-resistive noncombustible construction.

j) the covered mall shall be provided with break-out panels, skylights mechanical ventilation or other approved method of providing for ventilation of products of combustion in case of fire.

k) one-half (½) of the required number of exitways from each tenant area shall lead to the outside by means other than through the covered mall.

Exception: Tenant areas less than twenty-five hundred (2500) square feet in area.

l) exit signs and directional (exit) signs indicating the nonmall exitways shall be located so as to be easily visible from the mall-tenant area entrance.

m) exitways from the covered mall shall be located so that the length of travel from any mall-tenant area entrance to the exitway shall not exceed two hundred (200) feet.

n) standpipes and hose cabinets shall be provided at two hundred (200) foot intervals along the covered mall.

SECTION 426.0 NURSING HOMES, REST HOMES, CHARITABLE HOMES FOR THE AGED, CONVALESCENT HOMES AND HOSPITALS.

Buildings in use group H-2 used as nursing homes, rest homes, charitable homes for the aged, convalescent homes and hospitals shall meet the provisions of NFPA 101 Life Safety Code, 1967, the applicable provisions of the Basic Code and the following provisions:

426.1 MEANS OF EGRESS.

426.11 CORRIDORS: Corridors shall terminate at stairwells or at doors to grade, except that subsidiary corridors off main corridors, restricted to service areas (linen closets, janitor closets, bathing areas, beauty or barber shops, storage, utility rooms, treatment or examining rooms or offices) may be dead-ended providing they do not extend farther than twenty (20) feet beyond the exit stair, door or corridor and serve a total occupant load of not more than ten (10) persons.

426.12 PATIENT ROOM EGRESS: Two independent egresses shall be provided from each patient's room, one of which may be by communicating door or direct to the outside or as the building official directs.

426.13 WARD OR DORMITORY EGRESS: In wards or dormitories with six (6) or more occupants (patients or boarders) there shall be two (2) egresses, one of which shall be directly to the outside.

426.14 COMMUNICATING DOORS: Communicating doors in patients' rooms and the direct-to-the-outside door from wards or dormitories with six (6) or more occupants may be omitted from type 1, 2A or 2B construction with the approval of the building official.

426.15 STAIRWAYS: Stairs shall be a minimum of four (4) feet between walls or between walls and balustrades. Egress doors to the outside shall be forty-four (44) inches in width. Doors from the patients' rooms to the corridor shall be three (3) feet six (6) inches in width. Communicating doors between rooms shall be a minimum of two (2) feet and eight (8) inches in width.

426.17 EGRESS DOOR WIDTHS: Egress doors to the outside shall be forty-four (44) inches in width. Doors from the patients' rooms to the corridor shall be three (3) feet eight (8) inches in width. Communicating doors between rooms shall be a minimum of two (2) feet eight (8) inches in width.

426.2 CONSTRUCTION REQUIREMENTS: Nursing homes and convalescent homes shall be built only of type 1 and 2 construction.

SECTION 427.0 DAY CARE CENTERS (H-2)

Day care centers shall be subject to the applicable provisions of the Basic Code and the provisions of this section. Day care centers licensed by the Office of Children shall be subject to compliance with the rules and regulations of that authority.

427.1 LOCATION

427.11 HIGH HAZARD RESTRICTION: No day care centers may occupy the same building with or be within two hundred (200) feet of a high hazard occupancy.

427.12 BASEMENT USE: A basement, as defined in the Basic Code, of a type 4B construction structure, may not be used for a day care center.

427.2 MEANS OF EGRESS

427.21 FEWER THAN THIRTY (30) CHILDREN: Where the basement is used as the day care center or part thereof, for fewer than thirty (30) children there shall be two exitways placed as remote from each other as possible. One such exitway shall be directly to the outside at grade level and shall require less than eight (8) feet of vertical travel to reach the exitway discharge. In such an exitway, where stairs are used, the stairway may not be enclosed if the vertical travel is less than four (4) feet. Otherwise, a two (2) hour enclosure is required for the stairway with a one and one-half (1½) hour self-closing fire door.

427.22 THIRTY (30) OR MORE CHILDREN: Where the basement is used as the day care center or part thereof, for thirty (30) or more children, at least two (2) exitways, placed as remotely as possible from each other, shall be provided directly to the outside, one (1) of which shall discharge at ground level.

427.23 EXITWAY REQUIREMENTS: Exitway other than those required by sections 427.21 and 427.22 shall lead to the primary floor for discharge. Stairways for such exitways shall have egress doors which are self-closing and one and one-half (1½) hours fireresistance rating.

427.24 EGRESS ON FLOORS OTHER THAN BASEMENT: Each story shall be provided with not less than two (2) means of egress properly located, and such additional approved egresses shall be located from the occupied spaces so that to reach an egress, it will not be necessary to pass through a common corridor or space.

427.25 EGRESS FROM EACH ROOM: Two (2) approved egresses properly located shall be provided from each occupied room (one (1) of which may be by communicating door) leading to two (2) separate exits so arranged that to reach one it will not be necessary to pass through the common corridor or space.

426.16 EGRESS DOORS: All designated egress doors shall open in the direction of egress. Patient bedroom doors may swing in either direction, providing those swinging into a corridor are recessed and will protrude not more than five (5) inches into the corridor when opened ninety (90) degrees.

SECTION 427.0 DAY CARE CENTERS (H-2)

Day care centers shall be subject to the applicable provisions of the Basic Code and the provisions of this section. Day care centers licensed by the Office of Children shall be subject to compliance with the rules and regulations of that authority.

427.1 LOCATION

427.11 HIGH HAZARD RESTRICTION: No day care centers may occupy the same building with or be within two hundred (200) feet of a high hazard occupancy.

427.12 BASEMENT USE: A basement, as defined in the Basic Code, of a type 4B construction structure, may not be used for a day care center.

427.2 MEANS OF EGRESS

427.21 FEWER THAN THIRTY (30) CHILDREN: Where the basement is used as the day care center or part thereof, for fewer than thirty (30) children there shall be two exitways placed as remote from each other as possible. One such exitway shall be directly to the outside at grade level and shall require less than eight (8) feet of vertical travel to reach the exitway discharge. In such an exitway, where stairs are used, the stairway may not be enclosed if the vertical travel is less than four (4) feet. Otherwise, a two (2) hour enclosure is required for the stairway with a one and one-half (1½) hour self-closing fire door.

427.22 THIRTY (30) OR MORE CHILDREN: Where the basement is used as the day care center or part thereof, for thirty (30) or more children, at least two (2) exitways, placed as remotely as possible from each other, shall be provided directly to the outside, one (1) of which shall discharge at ground level.

427.23 EXITWAY REQUIREMENTS: Exitway other than those required by sections 427.21 and 427.22 shall lead to the primary floor for discharge. Stairways for such exitways shall have egress doors which are self-closing and one and one-half (1½) hours fireresistance rating.

427.24 EGRESS ON FLOORS OTHER THAN BASEMENT: Each story shall be provided with not less than two (2) means of egress properly located, and such additional approved egresses shall be located from the occupied spaces so that to reach an egress, it will not be necessary to pass through a common corridor or space.

427.25 EGRESS FROM EACH ROOM: Two (2) approved egresses properly located shall be provided from each occupied room (one (1) of which may be by communicating door) leading to two (2) separate exits so arranged that to reach one it will not be necessary to pass through the common corridor or space.

427.26 STAIRWAYS: All required egress stairways shall be enclosed with not less than one (1) hour fireresistance rating and one (1) hour fire-resistance self-closing doors unless otherwise specified in this section.

427.27 EGRESS LIGHTING: Egress lighting shall be provided as required by the building official and in conformance with article 6, including requirements for emergency lighting.

427.3 DOORWAYS: All exitway doorways shall be at least thirty-six (36) inches in width. All other doorways shall be at least thirty-two (32) inches in width.

427.4 HANDRAILS: All required egress stairways shall be provided with double handrails on both sides, and these shall be continuous including all runs and platforms and shall be built as follows:

a) the upper rail shall be installed at approximately thirty-three (33) inches high measured vertically at the face of the riser.

b) the lower rail shall be installed at approximately twenty (20) inches high measured vertically at the face of the riser.

427.5 HEATERS: Any heaters in spaces occupied by children shall be separated from the occupied space by partitions, guards, screens, or other means. Space and unit heaters using combustibles shall be prohibited.

427.6 BOILER ROOMS: Boilers, furnaces or other fire units shall be enclosed as required in section 1113. No boiler room door shall open into an occupied area.

427.7 FLOOR AND CEILING PROTECTION: When the occupied floor is above any usable space, the floor shall have a three-quarter (3/4) hour fire rating.

Reference Standards - Article 4

ANSI	PH22.31	1967	Motion Picture Safety Film
APHA		1957	Swimming Pools and other Public Bathing Places, Recommended Practice for Design, Equipment and Operation
Mass-DPS	FPR 2	1963	Dry-Cleaning and Dry-Dyeing, and the Keeping, Storage and Use of Cleaning and Dyeing Fluid in Connection Therewith
Mass-DPS	FPR 4	1968	Construction and Maintenance of Buildings or Other Structures Used as Garages and the Related Storage, Keeping and Use of Gasoline
Mass-DPS	FPR 5	1962	Construction, Location, Installation and Operation of Liquefied Petroleum Gas Systems, Gas Piping and Appliance Installations in Buildings
Mass-DPS			Board of Boiler Rules
Mass-DPS	FPR 6	1948	Manufacturing and Handling of Plastics
Mass-DPS	FPR 13	1965	Keeping, Storage, Manufacture or Sale in Limited Quantities of Flammable Fluids, Solids, or Gases
Mass-DPH	Article VI	1969	Minimum Standards for Swimming Pools
NFPA	Vol. 1	1969-70	Flammable Liquids
NFPA	24	1973	Outside Protection (Yard Piping)
NFPA	30	1973	Flammable and Combustible Liquids Code
NFPA	32	1972	Dry Cleaning Plants
NFPA	33	1973	Spray Finishing Using Flammable and Combustible Materials
NFPA	34	1966	Dip Tanks Containing Flammable or Combustible Liquids
NFPA	40	1967	Cellulose Nitrate Motion Picture Film
NFPA	42	1967	Pyroxylin Plastic in Factories, Storage, Handling and Use
NFPA	43	1967	Pyroxylin Plastic in Warehouses, Wholesale and Retail Store
Mass-DPS	PHR-1		Rules and Regulations of the Board to Facilitate the Use of Public Buildings by the Physically Handicapped

NFPA	58	1972	Liquefied Petroleum Gases, Storage and Handling
NFPA	59	1968	Liquefied Petroleum Gases at Utility Gas Plants
NFPA	60	1973	Pulverized Fuel Systems, Installation and Operation of
NFPA	61A	1962	Starch Factories, Prevention of Dust Explosions in
NFPA	61B	1959	Terminal Elevators, Prevention of Dust Explosions
NFPA	61C	1962	Flour and Feed Mills, Allied Grain Storage Elevators, Prevention of Dust Explosions
NFPA	63	1971	Industrial Plants, Fundamental Principles for Prevention of Dust Explosions in
NFPA	64	1959	Country Grain Elevators, Prevention of Dust Ignitions in
NFPA	68	1954	Explosion Venting Guide
NFPA	88	1968	Garages
NFPA	90A	1973	Air Conditioning and Ventilating Systems
NFPA	101	1967,1971 1973	Life Safety Code
NFPA	102	1972	Tents and Grandstands and Air-Supported Structures Used for Places of Assembly
NFPA	204	1968	Smoke and Heat Venting Guide
NFPA	329	1965	Underground Flammable and Combustible Liquid Tanks, Leakage From
NFPA	654	1963	Dust Explosion Prevention in Plastic Industry
NFPA	656	1959	Spice Grinding Plants, Prevention of Dust Ignitions in
NFPA	657	1967	Confectionery Manufacturing Plants, Prevention of Dust Explosions in
NFPA	701	1969	Flameresistant Textiles and Films, Standard Method of Tests for

ARTICLE 5

LIGHT AND VENTILATION

SECTION 500.0 SCOPE

The provisions of this article shall govern the means of light and ventilation required in all habitable and occupiable spaces and rooms. Every building and structure hereafter erected and every building, room or space which is changed in use shall be constructed, arranged and equipped to conform to the requirements of this article and the applicable standards listed in the reference section of this article.

500.1 OTHER REGULATIONS: Nothing in this article shall be construed to nullify the provisions of the local zoning by-laws or ordinances or subdivision controls promulgated under authority of Chapter 41, or Chapter 40A respectively of the Massachusetts General Laws Annotated as amended.

500.2 OTHER STANDARDS: Compliance with the applicable provisions of the standards listed in the reference section of this article shall be deemed to meet the requirements of this article, unless otherwise specifically provided herein.

SECTION 501.0 DEFINITIONS

COURT: an open, uncovered unoccupied space partially or wholly surrounded by the walls of a structure.

-ENCLOSED OR INNER: a court surrounded on all sides by the exterior walls of a structure or by such walls and an interior lot line.

-OUTER COURT: a court having at least one side thereof opening on to a street, alley, or yard or other permanent open space.

HABITABLE ROOM: a room or enclosed floor space arranged for living, eating, and sleeping purposes (not including bathrooms, water closet compartments, laundries, pantries, foyers, hallways and other accessory floor spaces).

HABITABLE ROOM, MINIMUM HEIGHT: a clear height from finished floor to finished ceiling of not less than seven and one-half (7½) feet, except that in attics and top half-stories the height shall be not less than seven and one-third (7-1/3) feet over not less than one-third (1/3) the area of the floor when used for sleeping, study or similar activity.

HABITABLE ROOM, MINIMUM SIZE: a room with a minimum dimension of seven (7) feet and a minimum area of seventy (70) square feet, between enclosing walls or partitions, exclusive of closet and storage spaces.

OCCUPIABLE ROOM: a room or enclosed space designed for human occupancy in which large numbers of individuals congregate for amusement, educational, or similar purposes or in which occupants are engaged at labor; and which is equipped with means of egress, light, and ventilation facilities meeting the requirements of the Basic Code.

VENTILATION. (See section 1801.0.)

WIDTH.

-INNER COURT: as applied to an inner court, means its least horizontal dimension.

-OUTER COURT: as applied to an outer court, means the shortest horizontal dimension measured in a direction substantially parallel with the principal open end of such court.

YARD: an open unoccupied space on the same lot with a building extending along the entire length of a street, or rear, or interior lot line.

SECTION 502.0 PLANS AND SPECIFICATIONS

Plans for all buildings and structures other than one and two-family and multi-family dwellings, which are designed for human occupancy shall designate the number of occupants to be accommodated in the various rooms and spaces and when means of artificial lighting and ventilation are required, the application shall include sufficient details and description of the mechanical system to be installed as herein required or as specified in article 18.

SECTION 503.0 STANDARDS OF NATURAL LIGHT

In the application of the provisions of this article, the standard of natural light for all habitable and occupiable rooms, unless otherwise specifically required by the provisions of article 4 for special uses and occupancies, shall be based on two hundred and fifty (250) foot candles of illumination on the vertical plane adjacent to the exterior of the light transmitting device in the enclosure wall and shall be adequate to provide an average illumination of six (6) foot candles over the area of the room at a height of thirty (30) inches above the floor level.

503.1 WINDOW AND SKYLIGHTS: All habitable and occupiable rooms or spaces shall contain windows, skylights, monitors, glazed doors, transoms, glass block panels or other light transmitting media opening to the sky or on a public street, yard or court complying with the provisions of this article. The light transmitting properties and the area of the devices used shall be adequate to meet the minimum daylighting requirements specified herein.

503.2 WINDOW SIZE: Windows and exterior doors may be used as a natural means of light and when so used their aggregate glass area shall amount to not less than one-tenth (1/10) of the floor area served.

503.3 INTENSITY OF ILLUMINATION: In all required exitways, except in one and two-family dwellings, and wherever natural lighting is not available, artificial lighting shall be provided to furnish not less than three (3) foot candles at the floor level of all required exitways.

503.4 STAIRWAYS AND EXITWAYS IN RESIDENTIAL AND INSTITUTIONAL BUILDINGS

503.41 WINDOWS: In all multi-family dwellings (use group L-2) and in institutional buildings for the care or treatment of people (use group H-2) required interior stairways shall be provided with windows to the outer air having a glass area of not less than ten (10) square feet which opens on a required street, alley, yard or court, or with the equivalent source of light for each story through which the stairway passes; and such additional artificial lighting to provide the equivalent illumination at all times that the building is occupied as specified in section 624.0.

503.42 SKYLIGHTS: When the building is not more than three (3) stories in height, a ventilating skylight of the required area may be used in lieu of windows.

503.43 HALLWAYS: Hallways shall have at least one window opening directly on a street or on a required yard or court in each story, located so that light penetrates the full length of the hallway, with additional windows for each change of direction of the hallway; or the equivalent artificial lighting shall be provided. Every recess or return with a depth or length which exceeds twice the width of the hall, and every corridor separately shut off by a door, shall be treated as a separate hall in applying the provisions of this section.

SECTION 504.0 STANDARDS OF NATURAL VENTILATION

Natural Ventilation shall be from unobstructed windows, skylights, monitors, doors, louvres, jalousies, or other similar openings. Such openings shall be direct to the sky, public street, space, alley, park, highway or right of way, or upon a yard, court plaza, or space above a setback located on the same lot and which complies with the requirements of Section 512.

504.1 AREA OF NATURAL VENTILATING OPENINGS: Natural ventilating openings from habitable spaces shall have a free area when open of at least 5 percent of the floor area of the space ventilated. The

occupiable spaces, the free openable area shall be the basis to determine the minimum requirements for supplementary mechanical ventilation. Free openable area is the cross-sectional area at plane of greatest restriction to air flow, exclusive of screening.

504.2 VENTING OF SPECIAL SPACES

504.21 ALCOVE ROOMS: When alcove rooms open without obstruction into adjoining rooms, the required window openings to the outer air shall be based on the combined floor area of room and alcove. No such alcove space shall be more than sixty (60) square feet in area and the opening to the adjoining room shall be not less than eighty (80) per cent of the superficial area of the dividing wall, unless provided with separate means of light and ventilation.

504.22 ATTIC SPACES: All attic spaces and spaces between roofs and top floor ceilings shall be ventilated by not less than two (2) opposite windows, louvres, or vents with a total clear area of opening not less than one-third (1/3) of one (1) per cent of the horizontally projected roof area.

504.23 CRAWL SPACES: In buildings and structures constructed without basements, in which the first floor construction does not bear directly on the ground, a space shall be provided under the first floor not less than eighteen (18) inches in depth; and such space shall be vented with screened openings having a clear area of not less than one-third (1/3) of one (1) per cent of the enclosed building area, or shall be provided with other means of ventilation approved by the building official. When floating mat foundations are provided in accordance with section 734.0, the requirement for ventilation shall not apply.

SECTION 505.0 VENTILATION OF INSTITUTIONAL BUILDINGS FOR FORCED DETENTION

In buildings of the Institutional use group used for enforced detention, all rooms shall comply with the requirements of this article for light and ventilation. However, where necessary, alternate means of complying with these provisions may be approved, providing that it can be shown that they fulfill all the requirements of these provisions for light and ventilation as applicable.

SECTION 506.0 EXISTING BUILDINGS

506.1 UNSAFE CONDITION: In all existing rooms or spaces in which the provisions for light and ventilation do not meet the requirements of this article and which in the opinion of the building official are dangerous to the health and safety of the occupants, he shall order the required repairs or installations to render the building or structure livable for the posted use and occupancy load.

506.2 ALTERATIONS: No building shall hereafter be altered or rearranged so as to reduce either the size of a room, or the fresh air supply, or the amount of available natural light to less than that required for buildings hereafter erected; or to create an additional room unless made to conform to the requirements of section 503. The building official may permit new rooms to be of the same height as existing rooms in the same story unless in his opinion greater provision of artificial light and ventilation is deemed necessary to insure healthful living conditions.

506.3 UNCOVERED YARD AND COURT AREA: No building shall be hereafter enlarged, nor shall the lot on which it is located be diminished so as to decrease the required courts or yards to less than that prescribed in this article for the lighting and ventilation of new buildings.

SECTION 507.0 STANDARDS OF ARTIFICIAL LIGHT

507.1 ARTIFICIAL LIGHT REQUIREMENTS: Adequate means for providing artificial light shall be provided in every occupiable space in every building hereafter erected and in the portions of existing buildings where alterations are performed.

507.2 MEANS OF EGRESS: Means of egress lighting shall comply with the requirements of article 6.

507.3 PLACES OF ASSEMBLY: Artificial lighting shall be provided as required in articles 4 and 6.

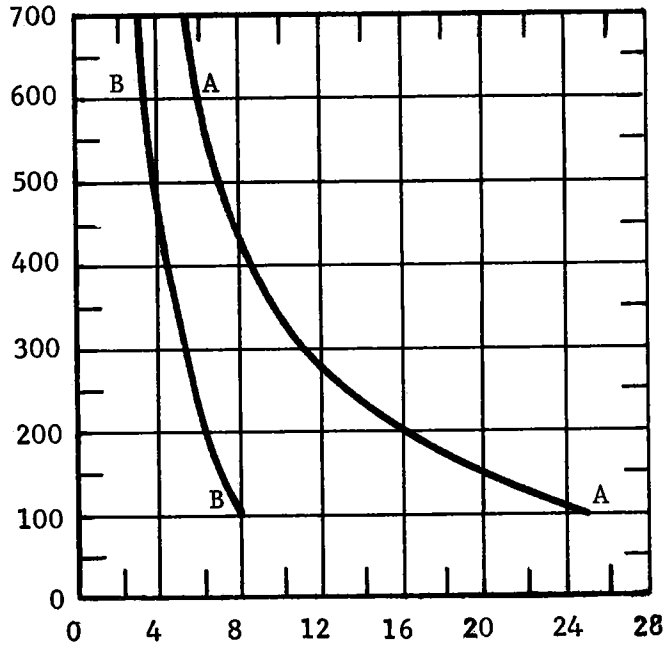
507.4 BATHROOMS AND TOILET ROOMS: Artificial lighting of bathrooms and toilet rooms shall be provided to produce an average of three (3) foot candles thirty (30) inches above the floor.

SECTION 508.0 STANDARDS OF MECHANICAL VENTILATION

508.1 AREAS REQUIRING MECHANICAL VENTILATION: Mechanical ventilation shall be provided in all occupiable rooms or spaces where the requirements for natural ventilation are not met; in all rooms or spaces, which because of the nature of their use or occupancy, involve the presence of dust, fumes, gases, vapors, or other noxious or injurious impurities, or substances which create a fire hazard; or where required by the provisions of section 509.0 or articles 4 and 6.

508.2 OUTSIDE AIR: Where mechanical ventilation is required the minimum amount of outside air introduced into any room or enclosed space shall be at least equal to the amount required by Figure 5-1.

508.21 FIGURE 5-1 MINIMUM OUTSIDE AIR REQUIREMENTS FOR VENTILATION AND AIR CONDITIONING



Minimum Outside Air, Cu. Ft. Per Person Per Min.

508.22 CURVE A - VENTILATION ONLY: The values obtained from Curve A in Figure 5-1 represent the minimum volume of outside air required for adults quietly occupied. Where the space has mechanical cooling, the values of Curve A represent the minimum amount of air to be circulated.

a) Values of Curve A shall be increased by twenty-five (25) per cent for areas in which the occupancies contain or involve:

   1) Grade school children
   2) Light smoking
   3) Food Service
   4) Other occupancies involving air contamination

b) Values of Curve A shall be increased fifty (50) per cent for areas in which the occupancies contain or involve:

   1) Manual labor
   2) Sports
   3) Dancing
   4) Heavy smoking
   5) Other occupancies involving heavy air contamination

c) Values of Curve A shall be increased by an appropriate amount to remove excess heat or moisture generated by equipment in the occupied area.

508.23 CURVE B - MECHANICAL COOLING: The values obtained from Curve B in Figure 5-1 represent the minimum volume of outdoor air required for adults quietly occupied where adequate control is maintained over temperature and humidity and where odor removal apparatus is used if smoking is permitted in the occupied area.

a) Where only part of the above-mentioned controls are maintained, the values of Curve B must be increased in accordance with good engineering design and subject to the approval of the building official.

508.3 MEANS OF EXHAUST: Exhaust may be accomplished by:

a) Forcing leakage through openings communicating directly to the outdoor air.

b) By drawing the vitiated air from spaces into the return duct of the system apparatus. When exhaust is to a return duct, the system apparatus shall be equipped to mix outdoor and return air under conditions which assure that the minimum amount of outdoor air will never be less than the sum of the minimum outdoor air ventilation requirements of all the spaces served by that system.

c) By drawing air into a fan-powered exhaust system discharging directly to the outdoor air.

508.4 MAKE-UP AIR: Sufficient air to replace the exhaust quantity shall be admitted to spaces which are under forcible exhaust by one or by any combination of the following methods:

a) If permitted by this Code, by infiltration through louvres, registers, or other permanent openings in walls, doors, or partitions of adjoining spaces where air is supplied in sufficient excess to meet the requirements of both spaces.

b) By infiltration through natural ventilation openings when the heating system is properly designed to permit such infiltration without causing drafts objectionable to the occupants.

c) By other methods acceptable to the building official, and in conformance with good engineering practice.

d) If permitted by this Code, exhaust may be accomplished by forcing leakage through permanent openings to adjoining spaces from which air is removed by method (c) above, provided the total amount of ventilation of both spaces is not reduced to less than the amounts required by Figure 5-1 and provided the space is not of the type from which recirculation of air is prohibited.

508.5 RECIRCULATION: Portions of the fresh air supply required in this section may consist of recirculated air as stated herein, subject to the prohibited use requirements of section 508.51 and the allowance for adsorption devices of section 508.6.

508.51 PROHIBITED USE OF RECIRCULATED AIR: The use of the air from Kitchens, Lavatories, Toilet Rooms, Bathrooms, Rest Rooms, Laboratories and Garages for recirculation shall be prohibited.

508.52 HABITABLE ROOMS: Recirculation of up to seventy-five (75) percent of the air supplied may be permitted in habitable rooms except kitchens, provided the air recirculated does not come from a plenum or system fed with air returned from habitable rooms in other dwelling units, or from stairways or common hallways. Recirculation of one-hundred (100) percent of the air supplied may be permitted if the system supplied only a single dwelling unit.

508.53 WORK ROOMS: Recirculation of not more than seventy-five (75) percent of the air supplied may be permitted in work rooms, provided the air is free from harmful dusts, fumes, vapors, mists, or gases.

NOTE: Recirculation of air removed by local exhaust systems is prohibited unless the contaminant is removed by an approved method to a safe limit of concentration. The amount of air supplied to replace all air exhausted by local exhaust ventilation systems shall be considered as fresh air in the calculation of the requirements in section 505.31 and 505.32 provided that the air supplied is free from contamination and is from an approved source. This provision also applies to cold air douches used in hot industries.

508.54 RESTAURANTS AND DINING HALLS: Not more than fifty (50) percent of the air supplied to restaurants and dining halls shall be recirculated.

508.55 OFFICES AND PUBLIC INSTITUTIONAL BUILDING: Not more than seventy-five (75) percent of the air supplied to offices and public and institutional buildings shall be recirculated.

508.56 HOSPITALS AND MEDICAL CARE FACILITIES: Hospitals and Medical Care Facilities may employ recirculated air in compliance with the approved methods and systems of the reference section of this article.

508.6 USE OF ADSORPTION DEVICES: If recirculation of air is permitted, the required outdoor air supply may be reduced to to fifty (50) percent, provided that an equivalent quantity of the recirculated air is passed through approved adsorption devices. The adsorption material, the material quantity and the means provided for maintaining the effectiveness of the absorption devices shall be acceptable to the building official and in conformance with good engineering practice.

a) Improper maintenance - Should absorption devices be improperly maintained in the opinion of the building official, he may order their removal. If the adsorption devices are removed, the ventilating system shall not be operated unless it will supply 100 percent of the outdoor air required by this section or section 508.0.

b) Test records - The building owner shall continuously maintain a record showing the manufacturer's recommendation for frequency of tests, the method of making tests, and the results of periodic tests of the adsorption devices. Such tests shall be made and certified by an approved agency at least twice every six months. The records of such tests shall be maintained for a period of at least two years, and shall be available for inspection by the building official.

SECTION 509.0 VENTILATION OF SPECIAL SPACES

509.1 KITCHENS: Kitchens shall be ventilated as follows:

a) Kitchens located within dwelling units and having a floor area of greater than seventy (70) square feet shall have natural ventilation as prescribed in section 504.0. When the floor area is seventy (70) square feet or less the kitchen shall be ventilated by either of the following:

   1) Natural means complying with section 504.0.

   2) Mechanical means exhausting at least two (2) cfm of air per square foot of floor area.

b) Kitchens, except those located within dwelling units, and any spaces where cooking of any kind is done, shall be ventilated by either of the following:

   1) Natural means complying with section 504.0 or mechanically air-cooled means complying with Figure 5-1 Section 508.21 and supplemented with auxiliary mechanical supply and exhaust ventilation adequate to remove the fumes and smoke from the cooking equipment when operating, in accordance with the provisions of article 18.

   2) Non-air-cooled mechanical means exhausting at least three (3) cfm of air per square foot of floor area, but in no case less than one-hundred and fifty (150) cfm.

c) Kitchens, snack bars, or pantries, where the operation consists of heating or warming previously prepared food that was cooked elsewhere, or where food is prepared in vending machines, may be ventilated by either or a combination of the following:

1) Natural ventilation complying with section 504.0.

2) Mechanical ventilation complying with section 508.0.

d) Air shall be exhausted through ducts or chimneys constructed in accordance with the provisions of articles 10, 11 and 18.

e) Make-up air shall be provided by one of the methods described in section 508.4.

509.2 BATHROOMS AND TOILET ROOMS: Bathrooms and toilet rooms shall be ventilated as follows:

a) When ventilated by natural means, the natural ventilation openings shall comply with section 504.0 except:

1) In no case shall the net free area of the ventilation openings be less than one and one-half (1½) square feet.

2) In occupancy groups H-1 and H-2, the ventilation openings may be to a vent shaft provided that the net free area of the opening is not less than three (3) square feet. The vent shaft cross-sectional area shall be equal to the sum of the required minimum ventilation openings plus one-fifth (1/5) square foot for every foot of height but not less than nine (9) square feet and open to the outer air at the top; or, the vent shaft may be open at the sides above the roof with louvres providing net free area equal to the area of the shaft.

b) By individual vent shafts or ducts constructed of non-combustible materials with a minimum cross-sectional area of one (1) square foot plus one-third (1/3) square foot for each additional water closet or urinal above two in number. The upper termination of such ducts shall be equipped with a wind actuated ventilator cap with throat area equal to the duct area.

c) When a bathroom or toilet room is not ventilated by a natural ventilation as required by this section, it shall be mechanically ventilated as follows:

1) Rooms containing only one water closet or urinal shall be mechanically ventilated by an exhaust system capable of exhausting at least forty (40) cfm.

2) Rooms containing more than one water closet or urinal, and any auxiliary spaces such as those used in hand basins, slop sinks, and locker rooms, shall be mechanically ventilated by an independent exhaust system capable of exhausting at least forty (40) cubic feet of air per minute per water closet or urinal. The outdoor air supply shall conform to the requirements of section 508.0.

3) Toilet exhaust systems shall be arranged to expel air directly to the outdoors.

d) Make-up air shall be provided by one of the methods described in section 508.4.

509.3 INSIDE LOCKER ROOMS: Inside locker rooms and dressing rooms for more than one person shall be ventilated at a rate of four changes of air per hour or as required by Section 508.22, whichever is greater.

509.4 CORRIDORS: Corridors shall have ventilation provisions to supply outdoor air in conformance to whichever of the following is greater:

a) For make-up of air exhausted to adjoining spaces. Provisions for make-up air supply shall conform to Section 508.4.

b) Natural sources complying with Section 504.0 to provide ventilating openings equivalent to at least two and one-half (2½) percent of the floor area.

c) In occupancy groups H-1 , H-2 and L-2, mechanical supply of at least one-half (½) cubic foot of outdoor air per minute per square foot of floor area.

SECTION 510.0 VENTILATION OF SHAFTS OTHER THAN ELEVATOR AND DUMBWAITER HOISTWAYS

All enclosed vertical shafts extending through more than two (2) stories of every building or structure, except elevator or dumbwaiter hoistways, shall be automatically vented to the outer air as herein required or as specified in section 911.0.

510.1 EXTENDING TO ROOF: Shaft enclosures extending to the roof shall be provided with a metal skylight constructed to comply with section 927.2 or with windows of equivalent area or with other approved automatic means of removing hot air and gases.

510.2 THERMOSTATIC CONTROL: The automatic operation of fire shutters, skylights and other vent relief devices may be controlled by fusible links designed to operate at a fixed temperature of not more than one hundred and sixty (160) degrees F., or by electric or pneumatic operation under a rapid rise in temperature at a rate of fifteen (15) to twenty (20) degrees F. per minute or by other approved methods.

510.3 NOT EXTENDING TO ROOF: Shaft enclosures not extending to the roof shall be provided with gas and smoke relief vents or adequate mechanical means of ventilation in conformity to the provisions of section 911.4 and article 18.

SECTION 511.0 INDUSTRIAL BUILDINGS WITH UNPIERCED ENCLOSURE WALLS

511.1 AIR CONDITIONING: When light and ventilation yards, courts or other required open spaces are not provided as herein specified, buildings may be erected for industrial and commercial uses within the height and area limitations of article 3 and table 2-6 when such buildings and structures are equipped with approved artificial lighting, ventilating and air conditioning systems furnishing the equivalent light and ventilation. The installation of all such systems shall comply with the provisions of article 18.

511.2 FIRE PROTECTION: Buildings and structures without exterior window openings in all stories which are provided with approved mechanical ventilating and air conditioning systems shall be equipped with the fire protection and fire-extinguishing media herein prescribed complying with the requirements of article 12;

511.21 ACCESS PANELS: Fire Access Panels of the required size and location shall be installed in the enclosure walls as specified in section 858.0.

511.22 FIRE ALARMS: Interior Fire Alarm signal systems shall be provided and maintained as specified in article 12;

511.23 SPRINKLERS: Two-Source Automatic Sprinkler systems with supervisory service and fire department connections shall be installed to comply with article 12;

511.24 FIRE-VENTING: The building or structure shall be fire-vented as prescribed in section 514.

SECTION 512.0 COURTS

All courts required to serve rooms for light and ventilation purposes shall comply with the requirements of this section.

512.1 WIDTH OF COURT.

512.11 MINIMUM WIDTH: Every such court shall have a minimum width of three (3) inches for each foot of height or fraction thereof but not less than five (5) feet for outer courts and twice these values for inner courts.

512.12 IRREGULAR COURT WIDTH: In the case of irregular or gore-shaped courts, the required minimum width of court may be deemed to be the average width, provided that no such court shall be less than five (5) feet at any point.

512.2 AREA OF COURT: The cross-sectional area of a required court shall be not less than one and one-half (1½) times the square of its width; nor shall the length of any court be more than twice its width.

512.3 ACCESS TO COURT: A door or other means of access shall be provided at the bottom of every court that is not otherwise conveniently accessible for purposes of cleaning.

512.4 AIR INTAKES TO COURT.

512.41 INNER COURT: Every court serving one or more habitable rooms that does not open for its full height on one or more sides to a street or legal yard shall be connected at or near the bottom with a street or yard by a horizontal intake or passage of fireresistive construction. Such intake or passage shall have a cross-sectional area of not less than twenty-one (21) square feet, and shall remain fully open at both ends and unobstructed for its full size and length, except that grilles of noncombustible construction complying with the approved rules may be permitted at the ends of the intake.

512.42 FIRERESISTANCE: The walls, floors and ceiling of such intakes or passages shall have a fireresistance rating of not less than two (2) hours in buildings of types 1, 2 or 3 construction and not less than three-quarter (3/4) hour in type 4 construction.

512.5 COURT WALLS: When in the opinion of the building official, windows facing on courts do not receive adequate direct light by reason of peculiar arrangement or orientation, he may require the walls to be constructed of light colored masonry, or to be painted and maintained a light color to furnish additional reflected light.

512.6 COURT DRAINAGE: The bottom of every court shall be properly graded and drained to a public sewer or other approved disposal system complying with the Massachusetts State Plumbing Code; and shall be paved with concrete or other non-absorbent material when required by the building official.

SECTION 513.0 OBSTRUCTION OF COURTS AND YARDS

513.1 PERMISSIBLE PROJECTIONS: Every required court and yard shall remain unobstructed for its required area and full height, except for the projections permitted in section 313.0. In residential and institutional buildings, clothes poles, arbors, garden trellises and other such accessories shall not be prohibited in the open spaces at ground level.

SECTION 514.0 FIRE EMERGENCY VENTILATING SYSTEM

In all buildings and structures herein required to have fire emergency ventilating systems, the common hallways shall be constructed with:

a) vertical fire vent stacks and lateral fire vent ducts as herein provided, or

b) windows to the outer air, or

c) mechanical ventilating or exhaust systems, or

d) other equivalent approved means for dissipating smoke, heated air and toxic gases directly to the outer air in the event of fire.

514.1 WHERE REQUIRED: Fire emergency ventilating systems shall be provided:

a) in buildings used for H-1 and H-2 (institutional) use groups which:

   1) exceed three (3) stories or forty (40) feet in height, and

   2) exceed ten thousand (10,000) square feet in floor area, and

   3) are occupied by more than fifty (50) persons above the first floor or have more than twenty-five (25) sleeping rooms above the first floor;

b) in buildings used for L-1 and L-2 (hotel and apartment house) use groups which:

   1) same as 1 above,

   2) same as 2 above,

   3) same as 3 above.

c) in all fully enclosed industrial building without provision of exterior openings for ventilation purposes.

514.2 FIRE VENT DUCTS: When the common hallways and exit ways are not ventilated by windows opening directly to the outer air as required in section 503, a system of collecting fire ducts shall be provided in each story of aggregate size to remove the smoke, hot air and noxious fumes or gases in event of fire. Each duct shall be not less than one (1) square foot in area located in the common hallways with screened openings complying with the approved rules, constructed as provided for hot air ducts in sections 1019 and 1119.

514.3 THERMOSTATIC OPERATION: When not connected to a vent stack the inlet openings on each story shall be controlled by automatic heat-operated devices as required in section 510.2 and in accordance with the approved rules.

514.4 FIRE VENT STACKS: When the fire ducts do not discharge directly to the outer air in each story, one or more fire vent stacks of adequate capacity shall be installed to accommodate the discharge from the fire duct system in any one floor or enclosed fire area, but in no case shall any individual stack be less than four (4) square feet in area, and all stacks shall terminate in an approved automatic cowl or ventilator outlet above the roof.

514.5 LOCATION OF STACKS: The vent stack shall be located in as central a position as practicable with respect to the floor area vented thereby, preferably in the vicinity of vertical shafts, and shall extend continuously to the roof.

514.6 VENT CONTROL OF STACKS: The vent control of the vertical stacks shall consist of approved noncombustible dampers, shutters, or glazed metal sash designed to open outwardly, located not less than twenty (20) feet distant from window openings or exitway doors in adjoining walls, and shall be equipped with a thermostatic unit arranged to open at a predetermined rate of temperature rise in accordance with the approved rules. Auxiliary mechanical means for manual operation of all vent controls shall be provided in an accessible location designated by the building official.

514.7 STACK CONSTRUCTION: The stack enclosure shall be constructed to be vapor and smoke tight with walls of not less than two (2) hours fireresistance, with no openings other than the fire duct inlets and the top automatic ventilator outlet.

514.8 MECHANICAL EXHAUST SYSTEMS: When mechanical exhaust is required to operate the emergency ventilating system either in horizontal ducts or vertical vent stacks, the installation shall be thermostatically controlled and installed in accordance with the provisions of article 18 and the approved rules.

SECTION 515.0 FIRE VENTILATION OF OPEN WELLS

Unenclosed well openings for moving stairways constructed in accordance with the provisions of ELV-2 and not accepted as a required element of an exitway shall be permitted in mercantile buildings when equipped with an approved two-source supervised automatic sprinkler system and protected on every floor pierced by the opening with an approved automatic exhaust system or by other approved methods as herein required to prevent the passage of fire, smoke and gases to the story above.

515.1 EXHAUST SYSTEM: The approved automatic exhaust system may be a separate unit or integrated with an approved air conditioning system and shall be thermostatically controlled to operate simultaneously with the detection of fire.

515.11 CAPACITY OF EXHAUST SYSTEM: The exhaust system shall be of adequate capacity to create a down draft in the open well with sufficient velocity of flow over the entire area of the well opening under normal conditions of window and door openings in the building. In air conditioned buildings the system shall operate satisfactorily to the building official with the normal air conditioning fans shut off.

515.2 WATER CURTAIN: An approved water curtain with baffles shall be located to form a continuous water barrier extending from floor to ceiling on all exposed sides of the well opening. Such water curtain shall be formed and operated automatically, either with open sprinklers or spray nozzles or with approved automatic sprinklers, or other approved thermostatically controlled devices.

515.3 POWER CONTROL: The power lines to all parts of the exhaust system and fresh air intake shall be furnished from an independent power supply complying with article 15 and the reference standards of this article for the control of automatic fire pumps and blower and exhaust systems.

515.4 AIR CONDITIONED BUILDINGS: The exhaust system herein required, when installed in an air conditioned building, shall be so arranged so to automatically stop the operation of the mechanical air conditioning and ventilating systems and close the dampers of the return air duct connection in the event of fire.

SECTION 516.0 WINDOW CLEANING SAFEGUARDS

All buildings and structures over fifty (50) feet or four (4) stories in height, in which the windows are cleaned from the outside, shall be provided with anchors or other approved safety devices shall be of approved design, constructed of corrosion-resistive materials securely attached to the window frames or anchored in the enclosure walls of the building. Cast iron or cast bronze anchors shall be prohibited.

Reference Standards - Article 5

USHEW	HRA-74-4000		General Standards of Construction and Equipment for Hospital and Medical Facilities
Mass-DPH	Article II	1969	Minimum Standards of Fitness for Human Habitation
ASHRAE		1967	Guide and Data Book, Handbook of Fundamentals
ASHRAE		1968	Guide and Data Book, Applications
ASHRAE		1969	Guide and Data Book, Equipment
Mass-DPS	ELV-2	1971	Board of Elevator Regulations: Elevator, Dumbwaiter, Escalator, and Moving Walk Regulations

ARTICLE 6

MEANS OF EGRESS

SECTION 600.0 SCOPE

The provisions of this article shall control the design, construction and arrangement of building elements required to insure safe means of egress from all buildings hereafter erected, and from all buildings thereafter altered to a new occupancy load, or manner of use, or inherent fire hazard. Existing buildings and uses shall be controlled by the provisions of section 605.

600.1 MODIFICATION OF EXITWAY REQUIREMENTS: When strict compliance with the provisions of the Basic Code is not practical, the building official may accept alternate means of egress which will accomplish the same purpose, by the procedure established in article 1, section 101.22.

600.2 MINIMUM REQUIREMENTS: It shall be unlawful to alter any building or structure in any manner that will reduce the number of exitways or the capacity of exitways below the requirements of this Code for new buildings of the proposed use and occupancy.

600.3 OTHER STANDARDS: Compliance with the applicable provisions of the standard listed at the end of this article shall be deemed to meet the requirements of this article, unless otherwise specifically provided herein.

SECTION 601.0 DEFINITIONS

AUTOMATIC FIRE DOOR: (see section 901.0)

AUTOMATIC COLLAPSIBLE REVOLVING DOOR: a door which is designed, supported and constructed so that the wings will release and fold back in the direction of egress under pressure exerted by persons under panic conditions, providing a legal passageway on both sides of the door pivot.

COMMON HALLWAY: a common corridor or space separately enclosed which provides any of the following in any story:

a) common access to the required exitways of the building, or
b) common access for more than one (1) tenant, or
c) common access for more than thirty (30) persons.

DOORWAY: the clear width of the opening protected by a door, subject to the width reduction provisions of this Code.

ESCALATOR: a moving stairway.

EXITWAY: that portion of a means of egress which is separated from all other spaces of a building or structure by construction or equipment as required in this Code to provide a protected, unobstructed way of travel to the exitway discharge.

EXITWAY ACCESS: exitway access is that portion of a means of egress which leads to an entrance to an exitway.

EXITWAY DISCHARGE: that portion of a means of egress between termination of an exitway and a public space with access to a public way or street.

FIRE DOOR: (see section 901.0)

FIRE DOOR ASSEMBLY: (see section 901.0)

FIRE WINDOW: (see section 901.0)

FLOOR AREA, GROSS: for the purpose of determining the number of persons for whom exits are to be provided, gross floor area shall be the floor area within the perimeter of the outside walls of the building under consideration, with no deduction for hallways, stairs, closets, thickness of walls, columns, or other features.

FLOOR AREA, NET: for the purpose of determining the number of persons for whom exits are to be provided, net floor area shall be the actual occupied area, not including accessory unoccupied areas or thickness of walls.

GRADE HALLWAY, GRADE LOBBY, GRADE PASSAGEWAY: an enclosed hallway or corridor that is an element of an exitway, terminating at a street or an open space or court communicating with a street.

HALLWAY, GRADE: (see grade hallway)

HORIZONTAL EXIT: a way of passage from one building or fire area to an area of refuge in another building or fire area on approximately the same level, which affords safety from fire or smoke from the area of escape and areas communicating therewith.

MEANS OF EGRESS: a continuous and unobstructed path of travel from any point in a building or structure to a public space and consists of three (3) separate and distinct parts: (a) the exitway access, (b) the exitway and (c) the exitway discharge; a means of egress comprises the vertical and horizontal means of travel and shall include intervening room spaces, doors, hallways, corridors, passageways, balconies, ramps, stairs, enclosures, lobbies, escalators, horizontal exits, courts and yards.

MOVING STAIRWAY: escalator.

SELF-CLOSING: as applied to a fire door or other opening protective, means normally closed and equipped with an approved device which will insure closing after having been opened for use.

SLIDESCAPE: a straight or spiral chute erected on the interior or exterior of a building which is designed as a means of human egress direct to the street or other public space.

SMOKEPROOF TOWER (FIRE TOWER): an interior enclosed stairway, with access from the floor area of the building either through outside balconies or ventilated vestibules opening on a street or yard or open court, and with a separately enclosed direct exitway leading directly to an exitway discharge at the street or grade floor.

STAIRWAY: one or more flights of stairs and the necessary landings and platforms connecting them to form a continuous and uninterrupted passage from one floor to another. A flight of stairs, for the purposes of this article, must have three (3) or more risers.

WINDER: a step in a winding stairway.

SECTION 602.0 PLANS AND SPECIFICATIONS

602.1 ARRANGEMENT OF EXITWAYS: The plans shall show in sufficient detail the location, construction, size and character of all exitways together with the arrangement of aisles, corridors, passageways and hallways leading thereto in compliance with the provisions of this Code.

602.2 NUMBER OF OCCUPANTS: In other than one and two-family and multi-family dwellings, the plans and the application for permit shall designate the number of occupants to be accommodated on every floor, and in all rooms and spaces when required by the building official. When not otherwise specified, the minimum number of occupants to be accommodated by the exitways shall be determined by the occupancy load prescribed in section 606. The posted occupancy load of the building shall be limited to that number.

SECTION 603.0 USE AND OCCUPANCY REQUIREMENTS

603.1 NEW BUILDINGS: Every building and structure and part thereof hereafter erected shall have the required number of exitways complying with the requirements of this Code. Exitways in combination with the exitway access and exitway discharge shall provide a safe and continuous means of egress to a street or to an open space with direct access across to a street.

603.2 MIXED OCCUPANCY GROUPS: When a building is classified in more than one (1) occupancy group, in accordance with the provisions of article 2, the exitway requirements for the entire building shall be determined on the basis of the occupancy group having the strictest exitway requirements; or the exitway requirements for each building section shall be determined separately; or when places of assembly, night clubs and rooms and spaces for similar occupancies are provided in a building section, the exitways shall be adequate for the combined occupancy tributary thereto.

603.3 MULTIPLE TENANTS: When more than one (1) tenant occupies any one floor of a building or structure, each tenant shall be provided with direct access to approved exitways.

603.4 BUILDING ACCESS FOR HANDICAPPED: All buildings and parts thereof classified in use groups C (Mercantile), D (Industrial), E (Business), F (Assembly), H (Institutional), L-1 and L-2 (Residential) shall have at least one primary entrance accessible to and usable by the handicapped. Such entrance shall provide access to a level that makes elevators available in buildings where elevators are provided. Where ramps are used to comply with this requirement, they shall have a slope not greater than one (1) in ten (10) and comply with the other provisions of this article for access to the handicapped.

SECTION 604.0 AIR-CONDITIONED BUILDINGS

604.1 LOCATION OF STAIRWAYS: In all buildings, without exterior window openings in all stories, that are artificially ventilated and air-conditioned as provided in section 511, the stairway element of required exitways shall be located as to be accessible to the fire department either through the access openings specified in section 858.0 or as otherwise approved in at least alternate stories of the building.

604.2 EXHAUST DUCTS: No exhaust ducts or vents of air-conditioning systems shall discharge into stairway or elevator enclosures nor shall corridors serving as exitway access be used as the return exhaust from air-conditioned spaces through louvres or other devices in the doors or partitions enclosing such air-conditioned spaces; unless such passageways are equipped with approved products of combustion detectors to automatically stop the supply and exhaust fans and close the louvres and unless such use is approved by the building official.

SECTION 605.0 EXISTING BUILDINGS

605.1 OWNER RESPONSIBILITY: The owner or lessee of every existing building and structure shall be responsible for the safety of all persons in or occupying such premises with respect to the adequacy of means of egress therefrom as required by this Code.

605.2 UNSAFE MEANS OF EGRESS

605.21 INADEQUATE EXITWAYS: In any existing building or structure, not now provided with exitway facilities as herein prescribed for new buildings and in which the exitways are deemed inadequate for safety by the building official, such additional provision shall be made for safe means of egress as he shall order.

605.3 NO CHANGE IN USE: When there is no change in use group or occupancy load, the minimum exitway requirements shall be as follows:

605.31 NEW EXITWAYS: If new or altered exitway facilities are installed or construction, they shall comply with all the requirements for new buildings.

605.32 EXISTING EXITWAYS: In all buildings (other than one and two-family dwellings) exceeding three (3) stories or forty (40) feet in height, or having more than seventy-five (75) occupants above or more than forty (40) occupants below grade floor, all existing enclosed stairways shall be enclosed with partitions and opening protectives of two (2) hour fireresistance rating complying with article 9; doors shall be self-closing. Existing enclosures of substandard fireresistive construction shall be covered on the stair side only with the component materials required for a two (2) hour fireresistive assembly.

605.33 FIRE ESCAPES: In buildings not over five (5) stories or sixty-five (65) feet in height, fire escapes complying with the requirements of section 621 may be accepted as a secondary means of egress when deemed adequate by the building official and when approved access to the street is provided from the termination of the fire escape.

605.4 EXISTING USE CHANGED: In every building or structure in which there is a change from one use group to another with special requirements, or when there is an increase in occupancy load, the exitway facilities serving the new use and occupancy shall be made to comply with all the provisions of this article for buildings hereafter erected.

SECTION 606.0 OCCUPANCY LOAD

606.1 DESIGN OCCUPANCY LOAD: In determining required exitway facilities, the number of occupants for whom exitway facilities shall be provided shall be established by the largest number computed as follows:

606.11 The actual number of occupants for whom each occupied space, floor, or building, as the case may be, is designed for; or,

606.12 The number of occupants computed at the rate of one (1) occupant per unit of area as prescribed in table 6-1; or,

606.13 The number of occupants of any space as computed in section 606.11 or 606.12 above plus the number of occupants similarly computed for all spaces that discharge through space in order to gain access to an exitway.

606.2 MEZZANINE FLOORS: The occupancy load of a mezzanine floor discharging through a floor below shall be added to the main floor occupancy and the capacity of the exits shall be designed for the total occupancy load thus established.

606.3 ROOFS: Roof areas occupied as roof gardens or for assembly, storage or other purposes shall be provided with exitway facilities

to accommodate the required occupancy load, but in no case shall there be less than two (2) approved means of egress for assembly uses from such roof areas.

606.4 SPECIAL USES: For areas in other use groups not specified in the Basic Code, the building official shall establish the occupancy load to be assumed in the design.

606.5 CONFLICTS: When there are special requirements for specific occupancies and uses in article 4 which differ from general requirements herein prescribed, such special provisions shall take precedence.

TABLE 6-1 FLOOR AREA ALLOWANCE PER OCCUPANT

USE	FLOOR AREA IN SQUARE FEET PER OCCUPANT
Areas without fixed seats	12 net
Areas with fixed seats (theatres, bleachers, etc.)	6 net (Note 1)
Areas with fixed seats (restaurants, bars, etc.)	8 net
Standing space	3 net
Bowling alleys, allow five (5) persons for each alley, including fifteen (15) feet of runway, and for additional areas	10 net
Business areas	100 gross
Court rooms	40 net
Day nurseries	35 net
Educational	(Note 2)
Garages and open parking structures	250 gross
Industrial areas	200 gross
Institutional	
Sleeping areas:	
Single occupant room	125 net
Multiple occupant room	90 net per occupant
In-patient areas	240 gross
Kitchens (non-residential)	200 gross
Locker rooms	20 gross
Mercantile, basement and grade floor area	30 gross
Areas on other floors	60 gross
Storage, shipping areas	100 gross
Residential	200 gross
Stages	
Performing areas	15 gross
Other areas	50 gross
Storage areas, mechanical equipment room	300 gross

Note 1: The occupant load for an assembly area having fixed seats shall be determined by the number of fixed seats installed.

Note 2: Standards for Educational uses are subject to the provisions of Reference Standard F-6, Building Regulations for Schoolhouses, of the State Building Code Commission.

SCHOOL HOUSES

SECTION 607.0 TYPES AND LOCATION OF EXITWAYS

All approved exitways, including doorways, passageways, corridors, hallways, interior stairways, exterior stairways, moving stairways, smokeproof towers, ramps, horizontal exits, bridges, balconies, fire escapes and combinations thereof shall be arranged and constructed as provided herein and in article 9 for fire enclosure requirements.

607.1 ARRANGEMENT: All required exitways shall be so located as to be visible and readily accessible with unobstructed access thereto and so arranged as to lead directly to the street or to an area of refuge with supplemental means of egress that will not be obstructed or impaired by fire, smoke or other cause.

607.2 SEPARATION OF EXITWAYS: Whenever more than one (1) exitway is required from any room, space or floor of a building, they shall be placed as remote from each other as practicable, and shall be arranged to provide direct access in separate directions from any point in the area served.

607.3 LENGTH OF TRAVEL: All exitways shall be so located that the maximum length of exitway access travel, measured from the most remote point to an approved exitway along the natural and unobstructed line of travel shall not exceed the distances given in table 6-2; except that in buildings of residential, mercantile or institutional use groups where the area is subdivided into rooms or compartments, and the egress travel in the room or compartment is not greater than fifty (50)* feet, the distance shall be measured from the exitway access entrance to the nearest exitway.

* May be increased to 100 feet, in use groups equipped with automatic sprinklers.

607.4 FLOORS BELOW GRADE: In buildings of all use groups the permissible length of exitway access travel on any floor more than one (1) story below grade shall not exceed seventy-five (75) feet.

TABLE 6-2 MAXIMUM LENGTH OF EXITWAY ACCESS TRAVEL (FEET)

USE GROUP	LENGTH	LENGTH WITH FIRE SUPPRESSION SYSTEM
High Hazard (A) ...	--	75
Storage (B)	100	150
Mercantile (C)	100	150
Industrial (D)	150	250
Business (E)	200	300
Assembly (F)	150	200
Institutional (H)..	100	200
Residential (L) ...	100	150

SECTION 608.0 CAPACITY OF EXITS

608.1 UNIT OF EXIT WIDTH: The basic whole unit of clear exit width is twenty-two (22) inches and its whole multiples. The allowance for excess width of twelve (12) inches to twenty-one (21) inches is one-half (1/2) unit. (No credit given for excess width less than twelve (12) inches.)

22" to 33" = 1 unit	33" to 43" = 1 1/2 units*
44" to 55" = 2 units	56" to 65" = 2 1/2 units
66" to 77" = 3 units	78" to 87" = 3 1/2 units

*A door 40" in width = 2 units; a single door 33" to 39" = 1 1/2 units; 40" to 44" = 2 units.

608.2 DESIGN CAPACITY ALLOWANCE: Specific modifications: article 4

Means of Computation:
Design Capacity = units of egress width (608.1) x number of persons per unit egress width (table 6-3).

TABLE 6-3 CAPACITY PER UNIT EGRESS WIDTH

	Without Suppression System Number of Occupants		With Suppression System Number of Occupants	
USE GROUP	Stairways and Ramps	Doors and Corridors	Stairways and Ramps	Doors and Corridors
High Hazard (A)	--	--	60	100
Storage (B)	60	100	90	150
Mercantile (C)	60	100	90	150
Industrial (D)	60	100	90	150
Business (E)	60	100	90	150
Assembly (F)	75	100	113	150
Institutional (H)	22	30	33	45
Residential (L)	75	100	113	150

NOTE: The main exitway of a bowling alley shall be of sufficient capacity to accommodate fifty (50) percent of the total occupant load, without regard to the number of aisles which it serves.

SECTION 609.0 NUMBER OF EXITWAYS

The following general requirements apply to buildings of all use groups. More restrictive requirements that may be provided in article 4 for special uses and occupancies shall take precedence over the general provisions of this section.

609.1 MINIMUM NUMBER: Except in one and two-family dwellings, there shall be two (2) or more approved independent exitways serving every floor area above and below the grade floor, one (1) or which shall be an interior enclosed stairway. Exitways in dwellings shall be so arranged that they may be reached without passing through another living unit.

609.11 EXITWAYS IN RESIDENTIAL USE GROUPS: In all multi-family residential use groups (L-2), except as provided in section 609.12, each apartment shall have access to at least two (2) independent exits which are remote from each other; such exits shall be so arranged that to reach either exit it will not be necessary to pass through a public corridor which serves the other.

609.12 EXITWAYS IN TYPE 1-A AND 1-B, L-2 USE GROUPS: In buildings of type 1-A or type 1-B construction a single exitway shall be permitted for every room, or group of less than four (4) rooms used for residential occupancy on multi-family floors, provided that elevator lobbies on all floors except the ground floor are enclosed with self-closing fire doors, and providing that all public corridors are zoned by self-closing fire doors, so that no entrance door of any room or apartment shall be more than fifty (50) feet from the nearest egress or segregating fire partition. Doors from elevator lobbies, doors in segregating fire partitions, and doors to stair enclosures, shall not be over two hundred (200) feet apart. Sleeping facilities shall be limited to not more than six (6) persons beyond the enclosed stairs. Rooms other than bedrooms connected with the same living unit may be permitted.

609.2 BASEMENT RECREATION ROOMS: In residential buildings (use group L-1 and L-2), the basements of which are used as playrooms or for similar recreation purposes, with an occupancy load of twelve (12) or more, such areas and the exitway shall be enclosed with partitions and ceiling of not less than three-quarter (3/4) hour fire-resistive construction. A direct secondary exit from the basement to streets, yards or courts leading to the street, shall be acceptable in lieu of the requirement for an enclosed stairway.

609.3 OPEN PARKING STRUCTURES: Parking structures shall have at least two (2) or more exitways from each parking tier, except that where vehicles are mechanically parked, only one (1) exitway need be provided in structures not exceeding eighty-five (85) feet in height. The maximum distance from any point on a parking tier to an exitway at that tier shall be three hundred (300) feet. Ramps used for the movement of vehicles need not be enclosed and may be considered as required exitways in structures not exceeding eighty-

five (85) feet in height where vehicles are attendant parked and in other structures having not less than two (2) enclosed stairways. The construction of stairways, ramps and stairway enclosures shall comply with the applicable requirements of this Code; except that stairways in a structure where vehicles are attendant parked and the height of the structure does not exceed fifty (50) feet, or in structures not exceeding eighty-five (85) feet in height where vehicles are mechanically parked, only one (1) stairway need be enclosed.

SECTION 610.0 EXITWAY ACCESS PASSAGEWAYS AND CORRIDORS

610.1 ACCESS PASSAGEWAYS: Direct exitway access shall be provided to required exitways through continuous passageways, aisles or corridors, conveniently accessible to all occupants and maintained free of obstruction.

610.11 TURNSTILES AND GATES: Access through turnstiles, gates, rails or similar devices shall not be permitted unless such a device is equipped to readily swing in the exiting direction of travel under a total pressure of not more than fifteen (15) pounds.

610.2 DEAD ENDS: Exitway access passageways and corridors in all stories which serve more than one (1) exitway shall provide direct connection to such exitways in opposite directions from any point in the corridor, insofar as practicable. In no case shall the length of a dead end corridor be more than twenty (20) feet.

see section 460.51

610.3 WIDTHS: The unit exit width and occupancy allowance of aisles and corridors, unless otherwise provided for special uses and occupancies in article 4, shall be the same as for exitway stairways (table 6-3) with a minimum total width of forty-four (44) inches in buildings of the storage, business, industrial and assembly use groups; sixty (60) inches in mercantile and institutional buildings other than those used for the movement of beds which shall be ninety-six (96) inches; and seventy-two (72) inches in church schools; except that in churches and chapels, side aisles may be one-half (½) the width but in no case less than thirty-two (32) inches clear.

See Section 460.52

610.4 OPENING PROTECTIVES: All door assemblies from rooms opening onto a common corridor, required by table 2-5 to be of three-quarter (3/4) fireresistive construction, shall be equipped with approved automatic or self-closing:

a) three-quarter (3/4) hour fire doors; or,
b) one and three-quarter (1-3/4) inch thick solid core wood doors; or,
c) their approved equivalent.

All door assemblies from rooms opening onto a common corridor, required by table 2-5 to be of two (2) hour fireresistive construction, shall be one and one-half (1½) hour fire doors.

SECTION 611.0 GRADE PASSAGEWAYS AND LOBBIES USED AS AN EXITWAY ELEMENT

611.1 ENCLOSURES OF PASSAGEWAYS: Every required interior and exterior exitway element which does not adjoin a street shall be directly connected to the street or to an open court leading to the street by an enclosed passageway, hallway, lobby or other unobstructed exitway element constructed as provided in this section and in section 909.0.

611.2 WIDTH AND HEIGHT: The effective width of the lobby or other enclosed passageway shall be not less than three-quarters (3/4) of the aggregate width of all required exitway stairways leading thereto and all required exitway doorways opening into the passageway. Such passageway shall have a minimum width of forty-four (44) inches and a minimum clear ceiling height of eight (8) feet.

611.3 MAXIMUM STAIRWAY LIMITATIONS: Not more than fifty (50) percent of required exitway capacity shall discharge through the same passageway.

611.4 CONSTRUCTION: The enclosures of grade passageways and lobbies connecting required means of egress to the street shall be of the firerated construction required for exitways in table 2-5. All openings which are elements or components of a required means of egress shall comply with the requirements of article 9 relative to opening protectives.

When there are accessory uses within the grade passageway or lobby a fire suppression system will be required.

SECTION 612.0 MEANS OF EGRESS DOORWAYS

section 460.54

The requirements of this section shall apply to all doorways serving as a component or element of a means of egress; except this section shall not apply to doorways leading to or from required stairways (see sections 616.6, 618.5, and 619.3).

section 460.6

612.1 NUMBER OF DOORWAYS: Every room with an occupancy load of more than fifty (50) or which exceeds one thousand five hundred (1500) square feet in area shall have at least two (2) egress doorways and the doors shall be hung to swing in the direction of exit travel without obstructing the required width of exitway.

612.11 ENTRANCE AND EGRESS DOORWAYS: Where separate doors are provided for entrance and egress use, the entrance door shall be clearly marked "ENTRANCE ONLY" in letters not less than six (6) inches in height and legible from both inside and outside; unless such doors are equipped with an emergency release bracket that will disengage the door operator and permit the door to swing outward under total pressure of not more than fifteen (15) pounds. Unless so equipped, doors swinging inward only shall not be accepted as part of the required egress elements. When doors are operated by mechanical opening device they shall comply with the requirements of section 612.44.

612.2 SIZE OF DOORWAYS: The minimum width of single doorways shall be thirty-two (32) inches and the maximum width shall be forty-four (44) inches with the following exception:

Access for the handicapped: In all buildings and parts thereof subject to the provisions of section 603.4 primary entrance and access doorways shall be thirty-six (36) inches or greater in width.

When the doorway is subdivided into two (2) or more separate openings, the minimum clear width of each opening shall be at least thirty-two (32) inches, and each opening shall be computed separately in determining the number of required units of exit width.

The minimum clear width of single doorways in one and two-family dwellings and from retail stores and similar spaces on the grade floor to the street, when not required as access for the handicapped, shall be thirty (30) inches or greater in width.

The height of doorways shall be at least six (6) feet eight (8) inches. In applying the provisions of this Code, the normal doorway opening with the allowance for door jambs as provided in section 612.21 shall be used for computing the required size doorways.

612.21 DOORWAY WIDTH REDUCTION: Door jambs may project into required width of an exit door opening not more than one (1) inch for each full twenty-two (22) inch exit unit.

612.3 LOCATION OF DOORS: The required doorways opening from a room or space within a building leading to an exitway access shall be located as remote as practicable from each other.

The distance of exitway access travel from any point in a room or space to a required exitway door shall not exceed the limitations of section 607.3 and table 6-2.

612.4 DOOR HARDWARE sect 460.62

612.41 OPERATION: Locks and fastenings on egress doors shall be readily opened from the inner side without the use of keys. Draw bolts, hooks and other similar devices shall be prohibited. The locking device must be of a type that will be readily distinguishable as locked.

Exception: A locking device to be used only after the normal course of business hours to prevent theft may be used on exit doors from a bank, trust company, jewelry store or other similar stores or establishments.

612.411 LOCKS IN MULTI-FAMILY DWELLINGS: Requirements for locks in multi-family dwellings are subject to the provisions of section 3R of Chapter 143 of the Massachusetts General Laws Annotated, as amended.

612.42 PANIC PROOF: In rooms of use group F-2 (assembly) with an occupancy load of more than fifty (50) and in rooms of use groups F-1 and F-3 (assembly) with an occupancy load of more than three hundred (300), egress doors shall be equipped with approved panic proof latches or bolts which release under a pressure of fifteen (15) pounds.

612.43 REMOTE CONTROL: In rooms of use group H-1 (institutional) occupied as places of detention, approved releasing devices with remote control shall be provided for emergency use.

612.44 MECHANICAL OPERATIONS: All doors which open into enclosed exitway stairs, exitway passageways or those which are installed to provide fire or smoke barriers across corridors shall be self-closing and be so maintained; or shall be automatic doors which will close upon activation of an approved smoke detector. Where egress doors are arranged to be opened by mechanical devices of any kind, they shall be so constructed that the door may be opened manually and will release under a total load of not more than fifteen (15) pounds applied in the direction of exitway travel.

612.5 DOOR CONSTRUCTION: All required egress doors that serve as an element of an exitway shall be self-closing or automatic fire doors with approved hardware, except for grade floor exitway discharge doors and revolving exitway doors as provided for in sections 612.51 and 613.0.

612.51 GRADE EXITWAY DISCHARGE DOORS: Doors at grade may be glazed with plate glass not less than seven thirty-seconds (7/32) inch thick or with any other approved glazing materials. Glass doors and adjacent lights which may, in the opinion of the building official, constitute a hazard by virtue of not being readily visible as a barrier, must be of approved safety glazing material.

SECTION 613.0 REVOLVING EXITWAY DOORS

613.1 LIMITATIONS OF USE

613.11 WHERE PERMITTED: Except in places of use group F (assembly) with an occupancy load of more than two hundred (200) and in buildings of use group H (institutional), approved automatic collapsible revolving doors when constructed and installed as herein provided shall be accepted in required exitway doorways from the first floor to the street but not to exceed fifty (50) percent of the total required grade floor exits.

613.12 PROHIBITED CONSTRUCTION: Braces or other devices that prevent normal operation of the automatic releasing mechanism shall be prohibited.

613.13 SUPPLEMENTAL EXITS: Approved swinging doors shall be provided to furnish one-half (½) the required exitway width in accordance with the provisions of this article. In any case, there shall be a minimum of two (2) approved swinging doors provided, one on each side and immediately adjacent to the revolving door.

613.2 WIDTH OF PASSAGE

613.21 UNIT EXIT WIDTH: Automatic collapsible revolving doors approved as an element of a required exitway shall provide a minimum clear unit exit width of passageway through the vestibule when the leaves are in a collapsed position.

613.22 MINIMUM DIAMETER: The minimum diameter of approved revolving doors shall be adequate to provide the required clear exit width when collapsed, but in no case less than six and one-half (6½) feet in diameter.

613.3 SPEED CONTROL: All approved automatic collapsible revolving doors shall be equipped with an approved speed control governor adjustable to safe traffic speed, but in no case more than fifteen (15) nor less than ten (10) revolutions per minute.

613.4 CONSTRUCTION: All approved automatic collapsible revolving doors shall be constructed as follows:

613.41 OPERATING MECHANISM: The collapsing mechanism shall be constructed of stainless steel or other approved corrosion-resistive materials;

613.42 USE OF WOOD: Where not otherwise required by the provisions of article 9, the doors may be constructed of wood or other approved materials of similar combustible characteristics, providing the construction is at least equivalent to that of a solid core three-quarter (3/4) hour fire rated door construction;

613.43 FLOOR COVERING: Approved mats of other floor coverings, complying with the provisions of article 9, not more than one-half (½) inch thick, may be installed within the enclosure when permanently secured to the structural flooring and finishing flush with the adjacent floor area;

613.44 GLAZING: The doors shall be glazed with not less than seven thirty-seconds (7/32) inch plate glass.

613.5 INSPECTION AND MAINTENANCE: The owner shall be responsible for the care, operation and maintenance of all revolving door installations after such doors are placed in operation. The building official may from time to time, and shall annually between December first and March first, examine each revolving door within his jurisdiction. If the buidling official finds that any revolving door fails to comply with the provisions of these regulations, he shall notify the owner of the changes which are necessary for compliance, and if the owner fails to make the necessary changes within thirty (30) days, shall order in writing the removal of the door. Periodic inspections shall be made by the person or firm responsible for the installation at intervals of not more than three (3) months and shall maintain all parts in proper working order.

TABLE 6-4 MINIMUM CLEAR DOORWAY WIDTHS

LOCATION	USE			Maximum Single Doorway Door Width
	1 AND 2-FAMILY DWELLINGS RETAIL STORES	E	ALL OTHER USE GROUPS	
GRADE EXIT DOORWAY	30" (Ref. section 612.2)	32"	32"	44"
DOORWAYS SERVING AS COMPONENT OR ELEMENT OF MEANS OF EGRESS	32"	32" (Ref. section 612.2) Doorway divided into 2 or more doors: 28" each		44"
STAIRWAY EXIT DOORWAY	36" (Ref. section 616.61)	42" (Ref. section 616.61)	As calculated by section 608.1	44"
SMOKEPROOF TOWERS 1) Interior stairs to vestibule 2) Vestibule or balcony to stairway 3) Stairway exit	No Requirements	42" (Ref. section 620.3)	As calculated by section 608.1	44"
EXTERIOR STAIRWAYS ACCESS	32" If part of required means of egress	As calculated by section 608.1		44"
DOORWAY REQUIRED AS ACCESS FOR HANDICAPPED	36" in retail stores	36"; doorway divided into 2 or more doors: 32" each		44"

SECTION 614.0 HORIZONTAL EXITS

Horizontal exits as herein defined shall be accepted as an approved element of a required means of egress when complying with the requirements of this article. The connection between the areas of refuge as herein specified may be accomplished by protected openings in a fire wall, by a vestibule, or by an open-air balcony or bridge.

614.1 OPENING PROTECTIVES: One side of the opening in fire walls or fire divisions which are required to have a fireresistance rating of two (2) hours or more shall be protected with a one and one-half (1½) hour self-closing fire door, swinging in the direction of exitway travel, and on the opposite side with an approved automatic fire door or water curtain. When serving as a dual element of a means of egress, there shall be adjacent openings with swinging fire doors opening in opposite directions.

614.2 SIZE OF DOORS: Size of openings in fire walls shall comply with the provisions of section 908, but in no case shall the width of one opening used as a required exit be greater than eighty-eight (88) inches nor shall the area exceed eighty (80) square feet.

614.3 AREA OF REFUGE: The areas connected by the horizontal exit shall be either public areas or spaces occupied by the same tenant and each such area of refuge shall be adequate to house the total occupancy load of both connected areas as provided in table 6-1.

614.4 UNLOCKED DOORS: Horizontal exit doors shall be kept unlocked and unobstructed whenever the area on either side of the horizontal exit is occupied.

614.5 EGRESS FROM AREA OF REFUGE

614.51 STAIRWAY EXITWAY: There shall be at least one (1) interior enclosed stairway of smokeproof tower on each side of the horizontal exit and any fire area not having a stairway accessible thereto shall be considered as part of an adjoining section with such stairway; but in no case shall the length of travel between the horizontal exit and the required exitway exceed the requirements of section 607.3 and table 6-2.

614.52 AUXILIARY ELEVATOR: When horizontal exits are provided in floors located twelve (12) or more stories above grade, the required stairway shall be supplemented by at least one (1) passenger elevator complying with section 621, maintained ready for use during normal occupancy of the building.

SECTION 615.0 EXITWAY RAMPS

Ramps with a gradient of not more than one (1) in ten (10) may be used as an exitway component and shall comply with all the applicable requirements of required interior stairways as to enclosure, capacity,

and limiting dimensions; except in existing buildings and where specified in article 4 for special uses and occupancies, larger gradients may be permitted, but in no case greater than one and one-half (1½) in ten (10). For all slopes exceeding one (1) in ten (10) and wherever the use is such as to involve danger of slipping, the ramp shall be surfaced with approved non-slip materials. In no case shall ramps required for the use of handicapped persons have a gradient of more than one (1) in ten (10).

615.1 HANDRAILS: Ramps required for use by handicapped persons shall have a handrail on at least one side that is not less than thirty (30) inches nor more than thirty-three (33) inches in height measured from the surface of the ramp. Handrails shall be smooth and shall extend one (1) foot beyond the top and the botton of the ramps and return to walls or ports at the ends.

615.2 LANDINGS: On ramps required for the use of handicapped persons, landings shall be provided at all ramp points of turning, entrance, exitway and doors at a minimum of thirty (30) foot intervals. All landings shall provide a clear distance of forty-two (42) inches from any door swinging to the ramp. Minimum landing length shall be forty-two (42) inches and the bottom landing of any ramp or set of ramps and landings of a straight run shall be a minimum length of seventy-two (72) inches.

SECTION 616.0 INTERIOR EXITWAY STAIRWAYS

616.1 CAPACITY OF EXITWAY STAIRS: The capacity of stairways and doors per unit of exit width shall be computed in accordance with section 608.

616.2 MINIMUM DIMENSIONS

616.21 WIDTH: All required interior stairways shall be at least forty-two (42) inches in width except that such width may be reduced to thirty-six (36) inches in buildings of use group L-3 (one and two-family dwellings) or in exitways from boiler rooms and similar service spaces not open to the public or in general use by employees.

616.22 HEADROOM: The minimum headroom in all parts of the stair enclosure shall be not less than six and two-thirds (6-2/3) feet.

616.23 RESTRICTIONS: No stairways shall reduce in width in the direction of exit travel.

616.3 LANDINGS AND PLATFORMS

616.31 WIDTH: The least dimension of landings and platforms shall be not less than the required width of stairway.

section 460.551

616.32 VERTICAL RISE: In buildings of use group F (assembly) and use group H (institutional) occupancy, the height of vertical rise shall not exceed eight (8) feet between landings and intermediate platforms.

TABLE 6-5 DOOR CONSTRUCTION

USE GROUP / DOOR USE	REQUIRED EGRESS ELEMENT OF EXITWAY	DOOR USE: GRADE FLOOR EXITWAY DISCHARGE	DOOR USE: STAIRWAY EXITWAY DOOR	DOOR USE: SMOKEPROOF TOWERS DOORS TO VEST. BAL. & STAIR	DOOR USE: EXTERIOR STAIRWAY ACCESS DOOR
ALL	Self-Closing or Automatic Fire Door	Glass (Ref. Sections 612.51 and 859)	Approved Self-Closing Swinging Fire Doors Complying with Article 9	1 1/2 Hours or Approved Labeled Equivalent Per Article 9	3/4 Hour Self-Closing Fire Door
ALL EXCEPT: F WITH MORE THAN 200 OCCUPANTS, AND H		Revolving Doors (Ref. Section 613.11) Materials (Ref. Sections 613.42 - 613.44)			
1 AND 2-FAMILY DWELLINGS	Not Specified	Not Specified	1 3/4 Inch Solid Core Wood	Not Applicable	Not Specified

TABLE 6-6 MINIMUM STANDARDS FOR STAIRWAY AND ENCLOSURE CONSTRUCTION

USE GROUP (ARTICLE 2)	A, B, C, D E, F, H, L	A, B, C, D E, F, H, L	A, B, C, D E L	F, H	L-3 1 & 2-Family Dwelling	L-3 1 & 2-Family Dwelling
TYPE OF CONSTRUCTION (ARTICLE 2)	1, 2, 3, 4	1, 2	3, 4	3, 4	1, 2; 3, 4	1, 2, 3, 4
HEIGHT NO. OF STORIES OR FEET	>3 >40	≤3 ≤40	≤3 ≤40	≤3 ≤40	≤3	>3
NO. ABOVE GRADE	>75	≤75	≤75	≤75	Not applicable	Not applicable
OF OCCUPANTS BELOW	-- >40	-- ≤40	-- ≤40	-- ≤40		
STAIRWAYS	Non-combustible	Non-combustible	No requirements	Non-combustible	No requirements	No requirements
ENCLOSURES	Non-combustible	Non-combustible	Note 1 No require.	Note 1 No require.	No requirements	No requirements
FIRE RATING	2 hrs	3/4 hr.	3/4 hr.	3/4 hr.	No requirements	3/4 hr.

Note 1: The enclosure and underside of stairways of combustible construction, except in one and two-family dwellings, shall be protected with fireresistive partitions and ceilings as herein required; firestopped as specified in sections 876, 909 and 921; and the space below the stairs shall be solidly enclosed with fireresistive partitions.

In all other buildings, no stairway shall have a height of rise of more than fifteen (15) risers between landings, nor shall any single stairway have less than three (3) risers.

616.4 TREADS AND RISERS

616.41 MINIMUM DIMENSIONS: The height of risers and the width of treads in inches shall be as follows: section 460.552

Use Group	Maximum Risers[1]	Minimum Tread[2]
One and two-family dwellings (use group L-3)		
All stairs with closed risers	8-1/4 inches	9 inches
Stairs with open risers	8-1/4 inches	9 inches
Assembly and Institutional	7-1/2 inches	10 inches
All others	8 inches	9 inches

[1]The maximum allowable variation in the height of risers is ± one-quarter (1/4) inches.

[2]All treads shall have an effective nosing of one (1) inch to one and one-quarter (1-1/4) inches and shall be the same for the entire stairway.

616.42 WINDERS: No winders shall be permitted in required exitway stairways except that in one and two-family dwellings and in ornamental stairways not required as an element of an exitway, treads with a minimum width of four (4) inches and an average width of nine (9) inches may be permitted.

616.5 STAIRWAY GUARDS AND HANDRAILS: Unless otherwise specifically provided for in this Code all stairways, except accessory stairways in one and two-family dwellings, shall have continuous guards and handrails on both sides, and in addition thereto, stairways required to be more than eighty-eight (88) inches in width shall have intermediate handrails dividing the stairway into portions not more than eighty-eight (88) inches wide.

616.51 HANDRAIL DETAILS:

a) handrails may project not more than three and one-half (3½) inches into the required stair width.

b) handrails shall be not less than thirty (30) inches nor more than thirty-three (33) inches, measured vertically, above the nosing of the treads.

c) stairways provided for use by handicapped persons shall have handrails which shall extend eighteen (18) inches beyond the top and bottom step if a guard or wall exists. All handrails covered by this section shall be returned to walls or posts at the ends of the stairways.

d) handrails shall be designed to support an applied load of two hundred (200) pounds in any direction at any point.

616.52 GUARD DETAILS:

a) guards shall be not less than thirty (30) inches in height measured vertically above the nosing of the tread.

b) guards shall be constructed so that the area in the plane of the guard from the top of the tread to the top of the guard is subdivided or filled in one of the following methods:

1) a sufficient number of intermediate longitudinal rails constructed so that the clear distance between rails (measured at right angles to the rail) does not exceed ten (10) inches. The bottom rail shall be not more than ten (10) inches (measured vertically) from the tread nosing.

2) balusters spaced not more than six (6) inches apart.

3) panels of wire mesh, or expanded metal, or ornamental grills which provide protection equivalent to that provided by the intermediate rails or balusters specified in the two preceeding paragraphs.

4) walls.

5) any combination of the foregoing.

616.6 STAIR EXITWAY DOORS

616.61 WIDTH: The clear width of every exitway doorway to or from a stairway shall be not less than the number of units of exit width required for the capacity of the stairway which services the floor or floor area from which the exitway door leads; but in no case shall such a doorway width be less than thirty-six (36) inches nominal in use group L-3 buildings (one and two-family dwellings) and forty-two (42) inches nominal width in use group E (business buildings).

616.62 DIRECTION OF SWING: All doors shall swing on a landing in the direction of exitway travel. When open, stair exitway doors shall not reduce the width of landings to less than the minimum required for its capacity and in no case to less than thirty-six (36) inches.

616.63 DOOR CONSTRUCTION: All doorway opening protectives, including the frames and hardware, shall be approved self-closing swinging fire doors complying with article 9 except in one and two-family dwellings where one and three-quarter (1-3/4) inch solid core wood doors are permitted.

616.7 SPIRAL STAIRWAYS: Spiral stairways of noncombustible construction may be used as an element of a means of egress from mezzanine areas not more than two hundred fifty (250) square feet in area nor more than one-third (1/3) the area of the floor below. The minimum width shall be twenty-two (22) inches for the accommodation of not more than ten (10) persons.

616.8 SUPPLEMENTAL STAIRWAYS: Monumental, ornamental, or accessory stairways shall not be allowed without required enclosures in use groups D (Industrial), F (Assembly), and H (Institutional), and structures of type 3B, 3C, 4A, and 4B construction, unless specifically allowed in section 418.22. In all other structures, monumental, ornamental or accessory stairways extending from the grade floor to the basement or to the second floor, when not required as an element of exitway and not connecting more than two (2) adjoining stories, shall be allowed without enclosures. Monumental, ornamental or accessory stairways shall be additional to and shall not obstruct or interfere with required exitways.

616.9 STAIRWAY CONSTRUCTION: Unless herein otherwise provided, all required interior stairways shall be built entirely of noncombustible materials with solid risers, treads and landing platforms and all finish floor surfaces on non-slip noncombustible materials; except that wood handrails shall be permitted, complying with the requirements of section 616.5. In one and two-family dwellings, open risers may be used.

616.91 STRENGTH: All stairways, platforms, landings and exitways in other than one and two-family dwellings, shall be adequate to support a live load of one hundred (100) pounds per square foot.

616.92 MINIMUM STANDARDS FOR STAIRWAY AND ENCLOSURE CONSTRUCTION: Reference table 6-6.

SECTION 617.0 ACCESS TO ROOF

617.1 BY STAIRWAY: In buildings four (4) stories or more in height with roofs having a slope of less than twenty (20) degrees, access to the roof shall be provided by means of a stairway. Where the roof is used as a roof garden or for other habitable purposes, sufficient stairways shall extend to it to provide the necessary exitway facilities from the roof as required for such occupancy.

617.2 ROOF ENCLOSURES: Stairways extending through roofs shall be enclosed in roof structures of fireresistive construction meeting the requirements of section 927.

SECTION 618.0 SMOKEPROOF STAIRWAY ENCLOSURE

618.1 WHERE REQUIRED: Al least one (1) of the required exitways shall be a smokeproof stairway enclosure in buildings over five (5) stories or over seventy (70) feet in height when one (1) of the following use groups:

a) C (Mercantile)
b) D (Industrial)
c) E (Business)
d) F-2, F-3, F-4, F-5, F-6, F-7 (Assembly buildings other than theatres)
e) H (Institutional)
f) L-1 (Hotel, dormitory)

618.2 ACCESS: Exitway access to the stairway at each story shall be through a vestibule or balcony with an unobstructed width not less than the required stairway width and a minimum dimension of seventy-two (72) inches in the direction of exit travel.

618.3 DOOR OPENINGS: Door openings from interior spaces to the vestibule or balcony and from the vestibule or balcony to the stairway shall be as required in section 612.2. The doors from interior spaces to the vestibule shall have a fireresistance rating not less than one and one-half (1½) hours and shall comply with the requirements of section 616.6 for stair exitway doors. The door from the vestibule to the stairway shall be not less than a one and three-quarter (1-3/4) inch solid wood door set in a steel frame. Wired glass may be used in the door not to exceed one hundred (100) square inches in area and set in a steel frame. Any door assembly must be fitted to ensure minimal air leakage.

618.4 TERMINAL PASSAGEWAY: The smokeproof enclosure shall terminate at grade level and shall provide egress to the street independently of all other exitways. When grade passageways are used, they shall comply with the requirements of section 611, except that there shall be no openings therein other than the smokeproof enclosure and street exit doorways. The passageway walls shall be of four (4) hour fireresistive construction and the floor and roof of three (3) hour fireresistive construction.

618.5 CONSTRUCTION: The construction of smokeproof enclosures shall be of walls with a four (4) hour fireresistive rating without openings other than the required doorways. The vestibule shall be considered to be an element of the exitway and shall be constructed in accordance with the fireresistive requirements of table 2-5. The balcony shall be constructed in accordance with the fireresistive requirements in table 2-5 for floor construction.

The stairshaft vestibule or balcony shall be provided with emergency lighting from an approved independent power source to assure continued illumination in case of emergency. In buildings over seventy (70) feet in height, the emergency lighting system may be integrated with the emergency power system required for fire suppression systems as required in article 12.

618.51 WINDOWS: All window openings in the exterior wall of the building, facing on the yard or court within thirty (30) feet below or to the side of any access balcony or vestibule shall be protected with three-quarter (3/4) hour opening protectives complying with article 9.

618.52 DOOR WIDTHS: Door openings from building to vestibules or balconies and to the stairways shall be not less than forty-four (44) inches wide. The doors shall be capable of being opened from both sides without a key, complying with all the requirements of section 616.6 for exitway doors for stairways, except that the fireresistance rating shall be not less than one and one-half (1½) hours or the approved labeled equivalent complying with article 9.

618.6 VENTILATION OF SMOKEPROOF STAIRWAY ENCLOSURES: Smokeproof stairway enclosures shall be ventilated with natural ventilation or mechanical ventilation meeting the requirements of section 618.7 or 618.8. In buildings over seventy (70) feet in height, ventilation in exitway stairways must conform to the requirements of article 12.

618.7 SMOKEPROOF STAIRWAY ENCLOSURES BY NATURAL VENTILATION: The balcony separating the smokeproof enclosure from the interior building spaces shall have at least one (1) open side adjacent to a street, alley, or yard with four (4) feet high guard railings across the open side(s). One open side of the balcony shall have a minimum open area of sixteen (16) square feet with no dimension less than thirty (30) inches. Doors must be located so as to be openable in any weather. There shall be no step between the balcony and the smokeproof stairway enclosure.

618.8 SMOKEPROOF ENCLOSURE BY MECHANICAL VENTILATION: The stairshaft and vestibule shall be provided with a mechanical ventilation system as specified herein that will be automatically activated on three (3) or more floors in case of emergency. Buildings over seventy (70) feet in height shall conform to the requirements for ventilation of article 12.

618.81 OPERATION OF VENTILATING EQUIPMENT: Vestibule and stairshaft mechanical ventilation may be inactive or may operate at reduced levels for normal operations, but when the detectors referred to herein either fail or are activated, the vestibule and stairshaft mechanical ventilation system shall operate at the levels specified in sections 618.82 and 618.83. The vestibule ventilation system shall be designed and activated in accordance with one of the following methods:

Method 1) - TOTAL SYSTEM. Simultaneous operation of all vestibules. If the vestibule mechanical ventilation system is designed to provide the ventilation in the vestibules on all floors simultaneously, a products-of-combustion detector shall be located outside each vestibule so designed that activation or failure of any one of the detectors will simultaneously activate the vestibule ventilation system on all floors.

Method 2) - ZONED SYSTEM. Simultaneous operation of three or more vestibules. If the vestibule ventilation system is designed as one or more zones to provide the simultaneous ventilation in the vestibules for at least a three (3) floor zone, automatic supply and exhaust dampers shall be provided in all vestibules in order to obtain the zoned control of the ventilation as follows:

A smoke detector shall be located outside each vestibule so designed to open the supply and exhaust duct dampers in the vestibules within the affected zone three (3) or more floors, and to actuate the stairshaft ventilation system in case any detector in the affected zone either fails or is activated.

618.82 VESTIBULE VENTILATION: The vestibule shall have an emergency ventilating system providing not less than one (1) air change per minute supply. The exhaust shall be one hundred fifty (150) percent of the supply. The supply shall be sufficient to maintain a pressure of 0.025 inches of water (0.0009 pounds per square inch) above ambient with all doors closed.

618.83 STAIRSHAFT VENTILATION: The stairshaft shall be provided with emergency mechanical supply and exhaust air. There shall be a minimum of one (1) air change per minute. The supply shall be sufficient to provide a minimum of 0.05 inches of water column pressure (0.00185 pounds per square inch) above ambient with all doors closed. Supply air shall be introduced at the level of the grade exitway discharge.

618.84 STANDBY POWER: Mechanical vestibule stairshaft ventilation systems and detector systems shall be powered by an approved self-contained generator designed to operate whenever there is a loss of power in the normal house current. The generator shall be located in a separate room of two (2) hour fireresistive construction and shall have a minimum fuel supply to operate the equipment for two (2) hours. In buildings over seventy (70) feet high, refer to article 12 for requirements for standby power in fire suppression system.

618.85 EMERGENCY LIGHTING: The vestibules and stairshaft shall be provided with emergency lighting. The standby generator which is installed for the vestibule and stairshaft mechanical ventilation equipment may be used for the standby emergency lighting power supply. In buildings over seventy (70) feet high, refer to article 12 for requirements for standby power in fire suppression systems.

618.86 FIRE PROTECTION INDICATOR PANEL: A fire protection indicator panel may be required by the fire official and located as practical inside the entrance to the smokeproof tower stairshaft at grade. Said panel shall indicate the floor or floors having caused the alarm. Said panel shall have an overriding manual switch capable of deactivating the ventilation equipment. For buildings over seventy (70) feet in height, refer to article 12 for fire protection indicator panel requirements.

618.87 FIRE DEPARTMENT CONNECTION: The fire protection indicator panel shall have a direct connection to the fire department facilities if required by the fire official.

618.88 ACCEPTANCE AND TESTING: Before the foregoing equipment is accepted by the building official, it shall be certified by a qualified registered professional engineer as being designed and capable of operating in compliance with these requirements and the equipment shall be tested and certified by a qualified registered professionsal engineer that it is operating in compliance with the requirements of this section.

618.89 BUILDING OWNERS' RESPONSIBILITY: The building owner shall have tested all the equipment referred to in these requirements at least once every ninety (90) days to ensure that all parts are in operable condition;

and he shall maintain a log attesting to the results. The log shall be available for inspection by the building official and the fire official. Once each year the system shall be inspected, tested and certified by a qualified registered professional engineer that it is in condition and capable of operating to meet these requirements.

SECTION 619.0 EXTERIOR EXITWAY STAIRWAYS

619.1 AS REQUIRED EXITWAY: Exterior stairways conforming to the requirements for interior stairways in all respects, except as to enclosures and except as herein specifically modified, may be accepted as an element of a required means of egress in buildings not exceeding five (5) stories or sixty-five (65) feet in height for other than use group H (institutional) provided there is at least one (1) additional stairway.

Exterior stairways which are accepted as exitway elements in residential buildings of use groups L-2 and L-3 shall be relieved from requirements for fire doors, but shall be provided with handrails and guards as required for interior stairs (section 616.5 and 616.52) and shall be protected from the weather as required in section 619.2.

619.11 LOCATION AND ARRANGEMENT: Exterior stairways may be utilized where at least one (1) door from each tenant space opens onto a roofed-over open porch or balcony served by at least two (2) stairways so located as to provide a choice of independent, unobstructed means of egress directly to the grade. Such porches and stairways shall comply with the requirements for interior exitway stairways as specified in section 616.0. Porches and balconies shall not be less than four and one-half (4½) feet in width. The stairways shall be located remotely from each other. The maximum travel distance from any tenant space to the nearest stairway shall be as specified in table 6-2. Porches and stairways shall be located at least ten (10) feet from adjacent property lot lines and from other buildings on the same lot unless openings in such buildings are protected by three-quarter (3/4) hour fireresistive doors or windows.

619.2 GUARDS AND CANOPIES: Guards shall be provided on all exposed sides of required exterior stairways to a height of five (5) feet, constructed of wire or other noncombustible weather resisting mesh having a maximum opening of one and one-half (1½) inches. The stairway shall be protected by metal or other approved noncombustible material to the extent necessary to ensure that the stairway remains in a safe, unobstructed and easily accessible condition in any weather.

619.3 OPENING PROTECTIVES

619.31 DOORS: Except as specified in section 619.1 for residential buildings, access shall be provided at each story through a three-quarter (3/4) hour self-closing fire door of the required number of unit exit widths.

619.32 WINDOWS: In buildings more than three (3) stories in height, or with an occupancy load of more than seventy-five (75) above or more than forty (40) below grade, the openings below and within ten (10) feet horizontally of the stairway shall be protected with approved three-quarter (3/4) hour automatic fire windows.

619.4 LOCATION

619.41 ACCESS TO STREET: All required exterior stairways shall be located so as to lead directly to a street or open space with direct access to a street; or when located on the rear of the building may lead through a passageway at grade complying with section 611.

619.5 CONSTRUCTION: Exterior stairs shall be constructed entirely of steel or other approved noncombustible materials with pipe handrails on both sides of stairways and platforms. On buildings of type 3 or type 4 construction, not more than three (3) stories in height, exterior stairways may be constructed of wood members not less than two (2) inches in thickness.

619.6 CAPACITY: The capacity of exterior exitway stairways which are used as a required means of egress are determined by section 608.1.

SECTION 620.0 MOVING EXITWAY STAIRWAYS

620.1 WHEN ACCEPTABLE: Moving stairways of the horizontal non-slip tread type moving in the direction of egress may be accepted as an approved exitway element in buildings of all use groups except assembly and institutional uses, when constructed and approved in accordance with the requirements of this article and the provisions of ELV-2, elevator, dumbwaiter, escalator, and moving walk regulations, promulgated by the Board of Elevator Regulations, of the Commonwealth of Massachusetts, Department of Public Safety. When accepted as an element of a required means of egress, they shall be enclosed with fire-resistive partitions as specified in section 616.

620.2 WIDTH: The width shall be not less than forty (40) inches between guards and the moving tread shall be not less than thirty-six (36) inches in width, and fifteen and three-quarter (15-3/4) inches in depth.

620.3 CAPACITY: The occupancy capacity shall be computed as provided in section 608 for exitway stairways.

620.4 LANDINGS AND PLATFORMS: Landings and platforms shall be provided at the top and bottom of each unit as required for interior exitway stairways.

620.5 RAILINGS: Guards shall be surmounted with moving handrails traveling at the same speed as the stairway.

620.6 EGRESS: Means of egress to the street shall be provided as specified herein for interior stairways except that in mercantile buildings completely equipped with a two-source automatic sprinkler system moving stairways may be accepted for one-third (1/3) the total required exit capacity when discharging through the main grade floor area.

620.7 CONSTRUCTION

620.71 NONCOMBUSTIBLE MATERIALS: Only noncombustible materials shall be used in the construction of moving stairways accepted as a required means of egress except for step wheels, handrails, electrical equipment, and wood veneers not more than one twenty-eighth (1/28) inch thick directly attached to metal or other noncombustible backing with a nonvolatile and nonflammable cement.

620.72 FIRERESISTANCE: The enclosure shall afford the fireresistance required for approved interior exitway stairways as specified in section 616.9.

620.73 HEIGHT OF TRAVEL PER UNIT: No single moving stairway unit shall have a vertical travel height of more than two (2) stories nor more than thirty-five (35) feet.

SECTION 621.0 FIRE ESCAPES

621.1 WHERE PERMITTED: Fire escapes shall be permitted only by special order of the building official, in existing buildings or structures not exceeding five (5) stories or sixty-five (65) feet in height, and when more adequate exitway facilities cannot be provided.

621.2 CONSTRUCTION: The fire escape shall be designed to support a live load of one hundred (100) pounds per square foot and shall be constructed of steel or other approved noncombustible materials, except as specified in sections 621.24 and 621.25. All fire escapes of other than wood, and any wood fire escape three (3) stories or higher, must have drawings and specifications submitted by a qualified registered professional engineer with his seal and signature, which include supporting structures.

621.21 DIMENSIONS: The width of the stairs shall be as specified in 621.22, but in any case shall be at least twenty-two (22) inches wide. Risers will be not more than eight (8) inches in height and treads not less than eight (8) inches in depth. Landings shall be a minimum of forty (40) inches wide by thirty-six (36) inches long, located not more than eight (8) inches below the access window or door.

621.22 CAPACITY: The capacity will provide for the intended occupancy load as designated by the building official and determined by section 608.1, but in no case may the width be less than twenty-two (22) inches. The width will be adequate to provide for the number of occupants.

621.23 OPENING PROTECTIVES: Doors and windows along the fire escape shall be protected with three-quarter (3/4) hour opening protectives in other than residence buildings of use groups L-2 and L-3.

621.24 OUTSIDE FIRE LIMITS: On buildings not over three (3) stories nor more than forty (40) feet in height located outside the fire limits, accommodating not more than twenty (20) persons, fire escapes may be constructed of wood or other approved material of similar combustible characteristics.

621.25 WITHIN FIRE LIMITS: Within Fire District No. 2, fire escapes may be constructed of wood not less than two (2) inches thick on buildings of type 3 or type 4 construction which are not more than three (3) stories in height.

SECTION 622.0 SLIDESCAPES

Slidescapes and safety chutes shall be permitted in buildings of the high hazard use group and in existing school and institutional buildings as emergency means of egress when unusual conditions warrant, as approved by the building official.

622.1 LOCATION: The arrangement and location of slidescapes shall conform to this article for means of egress and shall be designated by exit signs and lights as provided in section 624.

622.2 CONSTRUCTION: All chutes shall be constructed of approved noncombustible materials with a pitch in the line of travel of not less than twenty-four (24) nor more than forty-two (42) degrees measured on the developed circumference of spiral chutes. Straight chutes shall be not less than twenty-four (24) inches and spiral chutes not less than twenty-eight (28) inches wide in the clear; nor more than forty-four (44) inches wide in any case. When erected on the interior of a building, they shall be enclosed as required in section 616.9 for interior stairways with direct means of egress to the street or other public space.

622.3 EXTENSION TO ROOF: Where constituting a supplemental means of egress from roofs, all slidescapes and chutes shall extend to the roof as required for exitway stairways in section 617.

SECTION 623.0 EXITWAY SIGNS AND LIGHTS

section 460.56

623.1 SIZE AND LOCATION: Except in one- and two-family dwellings (L-3), and in exitways serving only three or fewer dwelling units in L-2 multi-family dwelling uses, all required exitways shall be provided with exit signs sufficient in number to indicate at any point in the required exitway the approved direction of egress discharge. Such signs shall incorporate an approved symbol to ensure understanding by non-English reading people and, if so desired, the

word "EXIT." Such symbol and lettering shall be at least six (6) inches in height. Such signs shall have either red outlines on a white background or the reverse, and shall be made of noncombustible material. All required exit signs shall be illuminated in conformance with section 623.2. All types of exit signs must be approved for use in the Commonwealth of Massachusetts by the State Building Code Commission.

623.2 ILLUMINATION: Lighting of all required "EXIT" signs will be adequate and of a character to ensure that the signs can be easily read under normal conditions wherever the building or area served is occupied. The level of light provided on the exposed face of the sign shall be at least twenty-five (25) foot candles or the equivalent.

623.21 POWER LEVELS: All "EXITWAY" signs shall be illuminated at all times when the building or area is occupied, by a power source which can be sustained at the required level for a period of at least the fire rating of the exitway at all times and provide power independent of the failure of any other circuit or source of power. Fire suppression systems incorporating an independent power source required by article 12 may serve as the independent power source for exitway signs and lights.

SECTION 624.0 MEANS OF EGRESS LIGHTING

624.1 ARTIFICIAL LIGHTING: All means of egress in other than one and two-family dwellings shall be equipped with artificial lighting facilities to provide the intensity of illumination herein prescribed continuously during the time that conditions of occupancy of the building require that the exitways be available.

624.2 INTENSITY OF ILLUMINATION: The intensity of floor lighting shall be not less than three (3) foot candles measured at floor level and maintained everywhere along the required egress path. There shall be adequate overlap of illumination sources to ensure that no area will be left in darkness due to the failure of a light element.

624.3 PLACES OF ASSEMBLY: In places of assembly for the exhibition of motion pictures or other projections by means of directed light, the illumination of floors of exitway access areas may be reduced during such period of projection to not less than one (1) foot candle.

624.4 INDEPENDENT POWER SOURCE: Emergency lights shall be provided with a power system ensuring continuous lighting at all times required in section 624.1 and incorporating a power source which can be sustained at the level specified in section 624.2 for a period of at least one and one-half (1½) hours, or as required by section 623.21 for cases in excess of one and one-half (1½) hours, and provide power at all times and independently of the failure of any other circuit or source of power. The independent power source may be the same required by article 12 for fire suppression systems.

624.41 POWER LEVELS: The power system shall be designed to ensure that whenever the voltage of the normal service falls below fifty (50) percent of nominal lamp voltage, emergency lighting service is instantly transferred to the independent power source. The service may be transferred back to the normal supply when that supply can provide at least eighty (80) percent of the nominal lamp voltage.

624.5 PLANS AND SPECIFICATIONS: The building official may require that all plans and specifications for emergency lighting be submitted by a registered professional engineer qualified by background in the design of such electrical circuits, and such plans and specifications shall have the seal and signature of the registered professional engineer certifying that the required systems are in compliance with the requirements of this Code.

Reference Standards - Article 6

NFPA	101	1967	Life Safety Code
NFPA	101	1967	Life Safety Code
NFPA	101	1973	Life Safety Code

ARTICLE 7

STRUCTURAL AND FOUNDATION LOADS AND STRESSES

SECTION 700.0 SCOPE

The provisions of this article shall control the structural design of all buildings and structures and their foundations hereafter erected to insure adequate strength of all parts thereof for the safe support of all superimposed live and special loads in addition to their own dead load, without exceeding the allowable stresses or design capabilities prescribed in this Code or by accepted engineering practice.

SECTION 701.0 DEFINITIONS

CONTROLLED CONSTRUCTION: the construction of a building or structure or a specific part thereof which has been designated and erected under the supervision of a licensed or registered engineer or architect using controlled materials as herein defined in compliance with accepted engineering practice under the procedure of section 128.0.

CONTROLLED MATERIALS: materials which are certified by an accredited authoritative agency as meeting accepted engineering standards for quality and as provided in sections 722 and 800.

FORMED STEEL CONSTRUCTION: that type of construction used in floor and roof systems consisting of integrated units of sheet or strip steel plates which are shaped into parallel steel ribs or beams with a continuous connecting flange deck; generally attached to and supported on the primary or secondary members of a structural steel or reinforced concrete frame.

FOUNDATION WALL: a wall below the floor nearest grade serving as a support for a wall, pier, column or other structural part of a building.

LIGHT GAGE STEEL CONSTRUCTION: that type of construction in which the structural frame consists of studs, floor joists, arch ribs, rafters, steel decks and other structural elements which are composed and fabricated of cold-formed sheet or strip steel members less than three-sixteenths (3/16) inch thick.

LOAD

-DEAD LOAD: the weight of all permanent construction including walls, floors, roofs, partitions, stairways and of fixed service equipment.

-EARTHQUAKE LOAD: the assumed lateral load acting in any horizontal direction on the structural frame due to the kinetic action of earthquakes.

-IMPACT LOAD: the load resulting from moving machinery, elevators, craneways, vehicles, and other similar forces and kinetic loads.

-LATERAL SOIL LOAD: the lateral pressure in pounds per square foot due to the weight of the adjacent soil, including due allowance for hydrostatic pressure.

-LIVE LOAD: the weight superimposed by the use and occupancy of the building, not including the wind load, earthquake load, or dead load.

-WIND LOAD: the lateral pressure on the building or structure in pounds per square foot due to wind blowing in any direction.

ORDINARY MATERIALS: materials which do not conform to the requirements of the Basic Code for controlled materials.

PRIMARY MEMBER: any member of the structural frame of a building or structure used as a column; grillage beam; or to support masonry walls and partitions; including trusses, isolated lintels spanning an opening of eight (8) feet or more; and any other member required to brace a column of a truss.

SECONDARY MEMBER: any member of the structural framework other than a primary member including filling-in beams of floor systems.

STEEL JOIST: any secondary steel member of a building or structure made of hot or cold-formed solid or open-web sections, or riveted or welded bar, strip or sheet steel members or slotted and expanded or other wise deformed rolled sections.

STRUCTURAL STEEL MEMBER: any primary or secondary member of a building or structure consisting of a rolled steel structural shape other than formed steel, light gage steel or steel joist members.

SECTION 702.0 DESIGN SAFE LOAD

702.1 STRUCTURAL ANALYSIS: The safe load for any strucutral member or system of construction shall be determined by accepted engineering analysis except as provided in sections 703 and 803 for tests of assemblies not capable of analysis.

702.2 CHECK TESTS: When there is reasonable doubt as to the design capacity of any structural unit or assembly, the building official may require that tests be made of such unit or assembly under the supervision of a qualified registered professional engineer. Such tests shall be made by an approved testing facility and personnel, and the procedures and results of such tests shall be signed and stamped by the said designated qualified registered professional engineer.

SECTION 703.0 TEST SAFE LOAD

703.1 WHEN REQUIRED: When not capable of being accurately analyzed, any system of construction or structural unit and its connections shall be subjected to tests prescribed in article 8 or in the test standards of this article or article 8, or to such other tests which may be certified by a qualified registered professional engineer as being acceptable for providing the information required. Any tests performed shall be conducted as required by the provisions of section 702.2 for testing.

703.2 TEST LOAD: The test load shall be subject to the provisions of section 804.1 and where applicable, deflections shall be limited as provided in section 804.2.

SECTION 704.0 DESIGN LIVE LOAD

704.1 REQUIRED LIVE LOAD: The live loads to be assumed in the design of buildings and structures shall be the greatest load produced by the intended use and occupancy, but in no case less than the minimum uniformly distributed unit loads required in section 707 for specific uses.

704.2 LOADS NOT SPECIFIED: The building official shall approve the live load for any use not specificially provided for in Table 7-1.

SECTION 705.0 DESIGN DEAD LOAD

705.1 CONSTRUCTION MATERIALS: In estimating dead load for the purposes of structural design, the actual weights of materials shall be used, but in no case less than the unit dead loads prescribed in the reference standards of this article.

705.2 SERVICE EQUIPMENT: The weight of all building service equipment including plumbing stacks, heating and air conditioning equipment and similar fixtures shall be included in the dead load supported by the structural frame.

705.3 PARTITION LOAD: In office and other buildings, in which subdividing partitions may be subsequently erected, rearranged or relocated, provision shall be made to support the actual weight of such partitions where they occur, or for an equivalent uniform load, which shall be assumed not less than twenty (20) pounds per square foot of floor area, in addition to the specified uniformly distributed live load. Provision for partitions weight shall be made whether or not partitions are shown on the plans, unless the specified live load exceeds eighty (80) pounds per square foot.

SECTION 706.0 EXISTING BUILDINGS

In the reconstruction, repair, extension or alteration of existing buildings, the allowable working stresses used in design shall be as follows:

706.1 BUILDING EXTENDED: When an existing building is altered by an extension in height or area, all existing structural parts affected by the addition shall be strengthened where necessary and all new structural parts shall be designed to meet the requirements for buildings hereafter erected.

706.2 BUILDING REPAIRED: When repairs are made to the structural portion of an existing building, and the uncovered structural portions are found unsound, such parts shall be made to conform to the requirements for buildings hereafter erected.

706.3 EXISTING LIVE LOAD: When an existing building heretofore approved is altered or repaired within the limitations prescribed in sections 106.3 or 106.4, the structure may be designed for the loads and stresses applicable at the time of erection, provided the public safety is not endangered thereby.

706.4 POSTED LIVE LOAD: Any existing building heretofore approved, in which there is no change in use to a new use group requiring greater floor loads, may be posted for the originally approved live loads, provided the building is structurally safe in all its parts and adequate for its existing use, and the public safety is not endangered thereby.

SECTION 707.0 UNIT LIVE LOADS

The plans for all buildings and structures intended for other than residential uses shall specify the live loads for which each floor or part thereof has been designed.

707.1 UNIFORM LIVE LOAD: The minimum uniformly distributed live load in pounds per square foot shall be as provided in Table 7-1 and for all concentrated loads wherever they occur as provided in section 708.

TABLE 7-1 MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS

OCCUPANCY OR USE	LIVE LOAD (PSF)
Apartments (see Residential)	
Armories and drill rooms	150
Assembly halls and other places of assembly:	
Fixed seats	60
Movable seats	100
Platforms (assembly)	100
Balcony (exterior)	100
One and two family residences only and not exceeding 100 sq. ft.	60
Bowling Alleys, poolrooms, and similar recreational areas	75
Cornices	75
Court Rooms	100
Corridors:	
First Floor	100
Other floors, same as occupancy served except as indicated	
Dance halls and ballrooms	100
Dining rooms and restaurants	100
Dwellings (see Residential)	
Fire escapes	100
On multi- or single-family residential buildings only	40
Garages (passenger cars only)	50
For trucks and buses use AASHO (1) land loads (see table 7-2 for concentrated load requirements	
Grandstands (see Reviewing stands)	
Gymnasiums, main floors and balconies	100
Hospitals	
Operating rooms, laboratories	60
Private rooms	40
Wards	40
Corridors, above first floor	80
Hotels (see Residential)	
Libraries:	
Reading rooms	60
Stack rooms (books & shelving at 65 pcf) but not less than	150
Corridors, above first floor	80
Manufacturing:	
Light	125
Heavy	250
Marquees	75
Office Buildings:	
Offices	50
Lobbies	100
Corridors, above first floor	80
File and computer rooms require heavier loads based upon anticipated occupancy	

TABLE 7-1

OCCUPANCY USE	LIVE LOAD (PSF)
Open parking structures (passenger cars only)	50
Penal institutions:	
Cell blocks	40
Corridors	100
Residential:	
Multi family houses:	
Private apartments	40
Public rooms	100
Corridors	80
Dwellings:	
First Floor	40
Second floor and habitable attics	30
Uninhabitable attics (2)	20
Hotels:	
Guest rooms	40
Public rooms	100
Corridors serving public rooms	100
Corridors	80
Reviewing stands and bleachers (3)	100
Schools:	
Classrooms	40
Corridors	80
Sidewalks, vehicular driveways, and yards, subject to trucking	250
Skating rinks	100
Stairs and exitways	100
Storage warehouse:	
Light	125
Heavy	250
Stores:	
Retail:	
First floor, rooms	100
Upper floors	75
Wholesale	125
Theatres:	
Aisles, corridors and lobbies	100
Orchestra floors	60
Balconies	60
Stage floors	150
Yards and terraces, pedestrians	100

TABLE 7-1

NOTES:

1) American Association of State Highway Officials.

2) Live load need be applied to joists or to bottom chords of trusses or trussed rafters only in those portions of attic space having a clear height of forty-two (42) inches or more between joist and rafter in conventional rafter construction; and between bottom chord and any other member in trussed or trussed rafter construction. However, joists or the bottom chords or trusses or trussed rafters shall be designed to sustain the imposed dead load or ten pounds per square foot (10 psf) whichever be greater, uniformly distributed over the entire span.

3) For detailed recommendations, see the Standard for Tents, Grandstands and Air-Supported Structures Used for Places of Assembly, NFPA 102, 1971.

707.2 POSTING OF LIVE LOADS: In every building or other structure or part thereof, used for mechanical, business, industrial or storage purposes, the design loads shall be marked on plates of approved design which shall be supplied and securely affixed by the owner of the building in a conspicuous place in each space to which they relate. Any plates lost, removed or defaced shall be replaced by the owner.

SECTION 708.0 CONCENTRATED LOADS

Floors of buildings used as specified in Table 7-2 shall be designed to support the uniformly distributed live loads prescribed in Table 7-1 or the following concentrated loads in pounds, whichever produces the greater stresses. Unless otherwise specified, the indicated concentration shall be assumed to occupy an area of two and one-half (2 1/2) square feet and shall be so located as to produce the maximum stress conditions in the structural members.

TABLE 7-2 CONCENTRATED LOADS

LOCATION	POUNDS
Elevator machine room grating (on area of 4 square inches)	300
Finish light floor plate construction (on area of 1 square inch)	200
Garages	(1)
Manufacturing and Storage Buildings	(2)
Office Floors	2000
Scuttles, skylight ribs and accessible ceilings	200
Sidewalks	8000
Stair treads (on area of 4 square inches at center of tread)	300

Note 1: Floors in garages or portions of buildings used for storage of motor vehicles shall be designed for the uniformly distributed live loads of Table 7-1 or for the following concentrated loads:

a) for passenger cars accommodating not more than nine (9) passengers, two thousand (2000) pounds acting on an area of twenty (20) square inches;

b) mechanical parking structures without slab or deck, passenger cars only, fifteen hundred (1500) pounds per wheel;

c) for trucks or buses, maximum axle load on an area of twenty (20) square inches.

Note 2: For buildings in which mechanical material handling equipment will be utilized, the structural floor slab shall be designed for the actual concentrated loads.

SECTION 709.0 IMPACT LOADS

The live loads specified in section 707 shall be assumed to include adequate allowance for ordinary impact conditions. Provision shall be made in the structural design for special uses and loads which involve vibration and impact forces.

709.1 ELEVATORS: All moving elevator loads shall be increased one hundred (100) percent for impact and the structural supports shall be designed within the limits of deflection as specified in the Department of Public Safety, Board of Elevator Regulations ELV-2.

709.2 MACHINERY: For the purpose of design, the weight of machinery and moving loads shall be increased as follows, to allow for impact:

TYPE OF MACHINERY	PERCENTAGE
Elevator Machinery	100
Light machinery, shaft or motor driven	20
Reciprocating machinery or power driven units	50
Hangers for floors or balconies	33

These percentages shall be increased when so recommended by the manufacturer.

709.3 CRANEWAYS: All craneways shall have their design loads increased for impact as follows:

a) a vertical force equal to twenty-five (25) percent of the maximum wheel load;

b) a lateral force equal to twenty (20) percent of the weight of the trolley and lifted load only, applied one-half (1/2) at the top of each rail; and

c) a longitudinal force of ten (10) percent of the maximum wheel loads of the crane applied at top of rail.

709.4 ASSEMBLY STRUCTURES: Grandstands, stadiums and similar assembly structures shall be designed to resist a horizontal swaying load applied parallel to the rows of seats, in addition to any wind loads, of not less than twenty-four (24) pounds per lineal foot of seats; and of not less than ten (10) pounds per lineal foot of seats applied transversely.

SECTION 710.0 SPECIAL LOADS

Provisions shall be made for all special loads herein prescribed and all other special loads to which the building or structure may be subjected.

710.1 BELOW GRADE: All retaining walls and other walls below grade shall be designed to resist lateral soil pressures with due allowance for hydrostatic pressure and for all superimposed vertical loads.

710.2 HYDROSTATIC UPLIFT: All foundation slabs and other footings subjected to water pressure shall be designed to resist a uniformly distributed uplift equal to the full hydrostatic pressure.

710.3 RAILINGS: Railings around stairwells, balconies and other floor openings, both exterior and interior, shall be designed to resist a load of at least two hundred (200) pounds applied in any direction at any point of the top rail, and also a vertical and a horizontal thrust of fifty (50) pounds per lineal foot applied at the top railing. The concentrated load and distributed loads need not be assumed to act concurrently. Railings and guards of grandstands and similar assembly structures shall be capable of resisting a lateral force of fifty (50) pounds per lineal foot and sustaining a vertical load of one hundred (100) pounds per lineal foot.

710.4 CONSTRUCTION LOADS AND ERECTION STRESSES: Provision shall be made for temporary construction and wind loads which may occur during the erection of the building; and all structural members and connections shall be designed and erected so as to prevent overstressing during construction.

SECTION 711.0 ROOF LOADS

The structural supports of roofs shall be designed to resist wind and where applicable, snow and earthquake loads in addition to the dead load of the construction and the appropriate live loads specified in Table 7-1.

711.1 SNOW LOAD as provided in section 712.0.

711.12 WIND LOAD as provided in section 715.0.

711.13 EARTHQUAKE LOAD as provided in section 718.0.

711.2 MINIMUM ROOF LOADS: Ordinary roofs, either flat, pitched or curved, shall be designed for the live loads as specified in Table 7-3.

TABLE 7-3 MINIMUM ROOF LIVE LOADS*

ROOF SLOPE	TRIBUTARY LOADED AREA in SQUARE FEET for ANY STRUCTURAL MEMBER		
	0 to 200	201 to 600	Over 600
Flat or rise less than 4 inches per foot Arch or dome with rise less than 1/8 of span	20	16	12
Rise 4 inches per foot to less than 12 inches per foot Arch or dome with rise 1/8 of span to less than 3/8 of span	16	14	12
Rise 12 inches per foot and greater Arch or dome with rise 3/8 of span or greater	12	12	12

*In pound-force per square foot of horizontal projection.

711.3 OVERHANGING EAVES: In other than one and two-family dwellings and except where framing of overhang is a continuation of the roof framing, overhanging eaves, cornices and other roof projections shall be designed for a minimum uniformly distributed live load of sixty (60) pounds per square foot.

711.4 PONDING: Roofs shall be designed for the maximum possible depth of water that may be ponded thereon as determined by the relative levels of roof deck and overflow weirs, scuppers, edges or serviceable drains in combination with the deflected structural elements.

711.5 SPECIAL PURPOSE ROOFS: When used for incidental promenade purposes, roofs shall be designed for a minimum live load of sixty (60) pounds per square foot; and one hundred (100) pounds per square foot when designed for roof gardens or assembly uses.

711.51 LANDSCAPED ROOFS: Where roofs are to be landscaped, the uniform design live load in the landscaped area shall be twenty (20) pounds per square foot. The weight of the landscaping materials shall be considered as dead load and shall be computed on the basis of saturation of the soil.

SECTION 712.0 SNOW LOAD

The basic snow loads to be assumed in the design of building or other structures are given in figure 7-1 in the reference standards of this article.

712.1 DESIGN SNOW LOAD: The snow loads of figure 7-1 shall be used for all buildings. Where exceptional conditions can be cited as applying to a particular region, the snow load requirements may be altered by the building official upon approval by the State Building Code Commission.

712.2 ROOF SNOW LOADS: The minimum snow loads for the design of both ordinary and multiple series roofs, either flat, pitched or curved, shall be determined my multiplying the ground snow load given in figure 7-1 in the reference standards of this article, by the appropriate coefficients, Cs, given in section 712.21. The snow loading analysis shall be based on the conditions providing the most unfavorable loading condition.

712.3 SNOW LOAD COEFFICIENTS: The basic snow load coefficient, Cs, shall be taken as eight-tenths (0.8) and shall be increased or decreased in accordance with figures 7-2, 7-3 and 7-4 of the reference standards of this article. For roofs that have a clear exposure to winds of sufficient intensity to remove snow and that have no projections such as parapet walls, a basic snow load coefficient of six-tenths (0.6) may be used. This coefficient may be applied only in those regions where the resulting reduced snow load is equal to, or greater than twelve (12) pounds per square foot. Roofs shielded on any side by obstructions within a distance of 10h from the building (h = height of obstruction above roof level) shall not be considered to have a clear exposure. Snow load distributions and coefficients for typical roof configurations are given in figures 7-2, 7-3 and 7-4 of the reference standards of this article. Where more than one (1) case is specified, each case shall be considered separately in designing structural elements.

SECTION 713.0 WIND LOAD

The structural frame of all buildings, signs, tanks or other exposed structures or parts of structures shall be designed to resist the horizontal pressures due to wind in any direction, both inwardly and outwardly, allowing for suction on the leeward side, as provided in sections 714 to 716 inclusive.

713.1 TORSIONAL RESISTANCE: The structural frame of all buildings and structures subjected to wind or other lateral loads shall be designed to resist the torsional moment due to eccentricity of the resultant load with respect to the center of rigidity of the structure.

SECTION 714.0 WIND ON VERTICAL SURFACES

The total wind pressures on vertical surfaces of ordinary buildings and structures to be considered in the design of primary members shall be in conformity with the following tables:

Exposure A	Pressure P			
Height (ft.)	Zone 1	Zone 2	Zone 3	Zone 4
Less than 30	10	10	10	12
30	10	10	12	14
50	10	12	14	17
100	12	16	19	23
150	14	18	23	27
200	16	21	27	34
250	18	23	30	36
300	20	26	33	40
350	22	28	35	44
400	23	30	38	46
450	25	31	40	49
500	26	33	42	52
550	27	35	44	55
600	28	36	46	58
650	29	38	47	59
700	30	40	50	62
750	31	41	52	65
800	32	42	54	66

Exposure A: Centers of large cities and very rough, hilly terrain.

Exposure B	Pressure P			
Less than 30	10	13	17	21
30	13	17	21	26
50	16	19	25	31
100	19	25	31	39
150	22	28	36	44
200	23	31	40	50
250	26	34	43	53
300	27	36	45	56

Exposure B		Pressure P		
Height (ft.)	Zone 1	Zone 2	Zone 3	Zone 4
350	28	38	48	59
400	30	40	51	63
450	31	41	52	65
500	32	43	55	66
550	34	44	56	68
600	35	45	57	71
650	36	47	60	74
700	37	48	61	75
750	38	50	62	76
800	39	51	64	80

Exposure B: Suburban areas, towns, city outskirts, wooded areas and rolling terrain.

Exposure C		Pressure P		
Less than 30	14	20	26	34
30	21	27	35	43
50	23	31	40	50
100	30	36	45	57
150	33	39	51	62
200	34	43	53	66
250	35	47	56	68
300	36	48	58	72
350	38	49	61	75
400	39	51	62	76
450	40	52	63	79
500	41	53	65	80
550	42	54	67	83
600	43	55	69	85
650	44	56	70	86
700	45	57	71	87
750	46	58	72	88
800	46	59	73	90

Exposure C: Flat open country, open flat coastal belts and grasslands.

Zone 1 consists of the Counties of Berkshire, Franklin, Hampshire and Hampden.

Zone 2 consists of the County of Worcester.

Zone 3 consists of the Counties of Middlesex, Suffolk, Norfolk, Plymouth and Bristol.

Zone 4 consists of the Counties of Essex, Barnstable, Dukes and Nantucket.

714.1 DISTRIBUTION OF WIND FORCES: The total wind pressure (section 714.0) shall be distributed between opposite walls, two-thirds (2/3) as normal pressure on the windward side and one-third (1/3) as normal outward suction on the leeward side.

714.2 SECONDARY WALL FRAMING AND WALL PANELS: Internal wind pressure or suction of thirty (30) percent of the prescribed pressures in section 714.1 shall be assumed to occur simultaneously with the external pressures in section 714.3 and 714.4.

714.3 AN EXTERNAL PRESSURE or suction to be considered in the design of secondary wall framing and wall panels and sheathing and their connections shall be one and one-half (1 1/2) times those in accordance with section 714.0 except at corners of all walls.

714.4 AT CORNERS OF ALL WALLS, the external suction to be considered in the design of secondary wall framing and wall panels and sheathing and their connections shall be two (2) times those in accordance with section 714.0. The suction shall be assumed to act on a vertical strip of width one-tenth (1/10) the least width of the building.

715.0 WIND LOAD ON ROOFS

The external wind pressures and suctions specified in sections 715.1 and 715.2 shall be considered in the design of primary roof framing and trusses.

External wind pressures and suctions to be considered in the design of secondary roof framing, purlins, roof panels and sheathing and their connections shall be one and one-half (1 1/2) times those determined in accordance with those sections. Internal pressures to be considered in the design of secondary roof framing and roof panels and sheathing and their connections shall be those specified in section 714.2 for wall elements.

715.1 PITCHED ROOFS: External wind forces on roofs, assumed to be acting upon primary roof framing members shall be not less than the following-listed fractions of the values specified in section 714.0, and shall be based on the average height of the roof eave above grade, the slope of the roof at the location under consideration and the ratio of sidewall height to building width.

EXTERNAL WIND PRESSURE ON ROOFS

Ratio of Sidewall Height to Building Width	FLAT ROOFS	WINDWARD SLOPE OF ROOFS				LEEWARD SLOPE
		LESS THAN 1:12	1:12 to 4.05:12	405:12 to 6:12	6:12 to 12:12	ALL SLOPES
0.2	-.60	-.60	-.06	.12	.19	-.50
0.4	-.60	-.60	-.33	.01	.09	-.50
0.6	-.60	-.60	-.49	-.20	-.06	-.50
0.8	-.60	-.60	-.57	-.30	-.18	-.50
1.0 or more	-.60	-.60	-.60	-.39	-.28	-.50

For all roof surfaces having a slope greater than 12:12 the same wind forces as for vertical surfaces shall be assumed.

715.2 CURVED ROOFS: The external wind forces assumed to be acting upon the primary framing members in the windward quarter of curved roofs shall be not less than the wind pressure specified in section 714.0 multiplied by the rise-to-span ratio of the entire roof arch, and shall be considered as acting as an inward acting pressure. An external suction of not less than seven-tenths (7/10) of the pressure specified in section 714.0 shall be assumed to be acting upon the center half of all arch roofs and an external suction of not less than six-tenths (6/10) of such pressures shall be assumed to be acting upon the leeward quarter of all such roofs. All wind pressures acting upon curved roofs shall be considered as acting normal to the chord of the curved section under consideration.

715.3 TEST DETERMINATION: With the approval of the building official, wind force on a building may be based on shape coefficients obtained from wind tunnel tests of models or by other approved methods. Such shape coefficients shall include the full effect of openings in wall or roof surfaces. In such cases the velocity pressure "q" to be used at any height shall be taken as .77 P.

715.4 ANCHORAGE: Roof framing shall be anchored to wall framing and the walls to foundations so as to resist wind uplift and sliding in excess of seventy-five (75) percent of the dead load resistance.

715.5 UPLIFT ON EAVES: Overhanging eaves, cornices and other local projections shall be designed and constructed to withstand an upward pressure of 1.5 P.

SECTION 716.0 WIND LOADS ON SIGNS, TANK AND RADIO TOWERS, CHIMNEYS AND OTHER BUILDING APPURTENANCES

Minimum wind pressures to be used in the design of these and other building appurtenances shall be determined using the value of P as specified in section 714.0.

716.1 SIGNS AND TOWERS: The wind pressure on ground signs and towers other than radio and television towers, and their supports or portions thereof having seventy-five (75) percent or more of solid surface shall be assumed at 1.2 P and having less than seventy-five (75) percent of solid surface shall be 1.6 P of net exposed area of the structure normal to the direction of the wind.

716.2 ROOF STRUCTURES: The wind pressure on roof signs, tank towers, stacks, chimney and other exposed roof structures with plane surfaces shall be assumed at 1.6 P applied to the net projected area of the structure normal to the direction of the wind except as provided in sections 716.3 and 716.4.

716.3 SHIELDING EFFECT: No shielding effect of one element by another shall be considered when the distance between them exceeds four (4) times the projected smallest dimension of the windward element.

716.4 EFFECT OF SHAPE: The wind pressure on circular tanks, stacks or other circular structures shall be assumed at 0.7 P applied to the projected area; and for hexagonal or octagonal structures, 1.0 P.

716.41 SPECIAL SHAPES: For special shaped structures such as spheres, guys, cables, solid girders, the design wind pressure shall be determined as provided for in section 715.3.

SECTION 717.0 OVERTURNING AND SLIDING

The overturning moment due to the wind load on all structures shall not exceed seventy-five (75) percent of the moment of stability resulting from the dead load of the building, unless the building or structure is anchored to resist the excess overturning moment and the excess horizontal shear over sliding friction.

SECTION 718.0 EARTHQUAKE LOAD

The provisions for earthquake load are in the process of being entirely revised to reflect more precise seismic probability forecast methods, and more complete structural analysis and design methods. The section will be available prior to November 1, 1974 for insertion in this Code.

SECTION 719.0 COMBINED LOADING

The structural frame of all buildings shall be investigated for the combined effect of lateral and vertical loading and the individual members of the frame shall be proportioned as follows:

719.1 WITH EARTHQUAKE: For combined stresses due to earthquake load together with dead, live and snow loads, the allowable working stress for the structural material may be increased thirty-three and one-third (33 1/3) percent.

719.2 WITH WIND: For combined stresses due to wind load together with dead, live and snow loads, the allowable working stress for the structural material may be increased thirty-three and one-third (33 1/3) percent.

719.3 MINIMUM SECTION: The section determined for the combined loadings herein specified shall be compared with that required for dead, live and snow loads only, and the section of greatest strength shall determine that to be used in the structure.

SECTION 720.0 LIVE LOAD REDUCTION

In all buildings and structures except places of assembly, the design live loads may be reduced on columns, piers, walls, trusses, girders and foundations as herein specified; but in no case shall a reduction be applied to the roof live load.

720.1 LIVE LOADS 100 POUNDS OR LESS: For live loads of one hundred (100) pounds or less per square foot, the design live load on any member supporting one hundred fifty (150) square feet or more may be reduced at the rate of eight-hundredths (0.08) percent per square foot of area supported by the members; except that no reduction shall be made for areas to be occupied as places of public assembly. The reduction shall exceed neither R as determined by the following formula, nor sixty (60) percent:

$$R = 23 (1 + D/L)$$

R = reduction in percent
D = dead load per square foot of an area supported by the member
L = design live load per square foot of area supported by the member.

720.2 LIVE LOADS MORE THAN 100 POUNDS: For live loads exceeding one hundred (100) pounds per square foot, no reduction shall be made, except that the design live loads on columns may be reduced twenty (20) percent.

SECTION 721.0 ALLOWABLE WORKING STRESSES

721.1 CONTROLLED MATERIALS: All structures controlled by the provisions of section 128.0, and all other materials subject to control in the building regulatory system, shall be identified as to manufacture, grade, and whatever other specifications as may be necessary to conform with the requirements for design and analysis of such controlled structures or materials.

721.2 ORDINARY MATERIALS: The use of ordinary materials without selection and without controlled design and supervision, or when the material is not identified as to strength and stress grade, shall be limited to the average unit working stresses prescribed in the reference standards of this article.

721.3 NEW MATERIALS: For materials which are not specifically provided for in the Basic Code, the working stresses shall be established by tests as provided in sections 703 and 803.

SECTION 722.0 LIGHT WEIGHT METALS

Aluminum and other light weight metals and their alloys may be used in the design and construction of buildings and structures only after special approval of the building official, subject to the determination of the physical properties by tests as prescribed in article 8 and in accordance with the provisions of section 834, and provided that plans and calculations are submitted by a registered professional engineer or architect.

SECTION 723.0 BEARING VALUE OF SOILS

All applications for permits for the construction of new buildings or structures, and for the alteration of a permanent structure which require changes in foundation loads and distribution, shall be accompanied by a statement describing soil in all bearing strata, including sufficient records and data to establish their character, nature and load bearing capacity. Such records shall be certified by a qualified registered professional engineer or architect.

723.1 SATISFACTORY FOUNDATION MATERIALS: Satisfactory bearing strata to provide structural support shall be considered to include the following, provided they are of a standard consistent with engineering applications: natural strata of rock, gravel, sand, inorganic silt, inorganic clay, or combinations of these materials. Compacted fills when designed and placed under the supervision of a qualified registered professional engineer or architect and certified by him as meeting the design requirements, may be accepted by the building official. Other conditions of unsatisfactory bearing materials which are altered under

the supervision of a qualified registered professional engineer or architect and certified by him as meeting the design requirments may be accepted by the building official.

723.11 LOADING INTERACTION: Wherever bearing strata are subject to interaction from other loadings or strata reactions, such conditions shall be incorporated in the evaluation of the design bearing capacity of the support strata.

723.12 BEARING CAPACITY FOR LIGHT WEIGHT STRUCTURES: Light weight structures and accessory structures such as garages and sheds may be founded on normally unacceptable bearing strata, providing such material is certified by a qualified registered professional engineer or architect as being satisfactory for the intended use.

723.13 PROTECTION OF BEARING STRATA: Bearing strata which may be adversely affected by conditions within the structure, such as evaporation and shrinkage due to excess heat, shall be adequately protected.

723.2 BEARING VALUES: The maximum pressure on soils under foundations shall not exceed values specified in table 7-4, except when determined in accordance with the provisions of section 725.0 or when modified by specific sections of this article.

TABLE 7-4 ALLOWABLE BEARING PRESSURES OF FOUNDATION MATERIALS

CLASS OF MATERIAL	ALLOWABLE BEARING PRESSURE IN TONS PER SQUARE FOOT
Massive igneous rocks and conglomerate, all in sound condition (sound condition allows minor cracks)	100
Slate in sound condition (minor cracks allowed)	50
Shale in sound condition (minor cracks allowed)	10
Residual deposits of shattered or broken bedrock of any kind except shale	10
Glacial till	10
Gravel, well-graded sand and gravel	5
Coarse sand	3
Medium sand	2

TABLE 7-4 (cont.)

Fine sand	1 to 2*
Hard clay	5
Medium clay	2
Soft clay	1
Inorganic silt, shattered shale, or any natural deposit of unusual character not provided for herein	*
Compacted granular fill	2 to 5*
Preloaded materials	*

*Values shall be determined by a qualified registered professional engineer or architect.

SECTION 724.0 SUBSURFACE EXPLORATIONS

724.1 WHERE REQUIRED: Where borings or tests are required, they shall be made at a sufficient number of locations and to such depths, and they shall be supplemented by such field or laboratory tests and engineering analyses, as are necessary in the opinion of the building official. When it is proposed to support the structure directly on bedrock, the building official may require drill holes or core borings to be made into the rock to a sufficient depth to prove that bedrock has been reached.

724.2 SOIL SAMPLES AND BORINGS REPORTS: Samples of the strata penetrated in test borings or test pits, representing the natural disposition and conditions at the site, shall be available for examination of the building official. Wash or bucket samples shall not be accepted. Duplicate copies of the results obtained from all completed and uncompleted borings plotted to a true relative elevation and to scale and of all test results or other pertinent soil data shall be filed with the building official.

SECTION 725.0 BEARING TEST AND SETTLEMENT ANALYSES

Whenever the allowable bearing pressure on bearing materials, or the load bearing capacity of single piles or groups of piles is in doubt, the building official may require load tests and/or settlement analyses to be made at the expense of the applicant and the results analyzed under the direction of a qualified registered professional engineer.

725.1 APPROVAL OF TEST METHOD: The apparatus and procedure used shall be approved by the building official before they are used. A complete record of the test results together with a soil profile shall be filed by the qualified registered professional engineer who shall have a fully-qualified representative on the site during all boring and test operations.

725.2 LOADING EQUIPMENT: The load shall be applied by direct weight or by means of a recently-calibrated jack. Each load shall be maintained constant for the required period with an accuracy of plus or minus three (3) percent.

725.21 AREA: For bearing materials of classes 1 to 5 inclusive, the load area shall be not less than one (1) square foot and for other classes, not less than four (4) square feet.

725.3 LOADING PROCEDURE: The application of the test load shall be in steps equal to not more than one-half (½) the contemplated design load, to at least twice the contemplated design load, except as provided in section 725.7. The unloading shall be in at least two (2) steps. to the design load and then to zero (0) load. During the loading cycle the contemplated design load and tweice the contemplated design load shall be maintained constant for at least twenty-four (24) hours and until the rate of settlement or rebound does not exceed two hundredths (.02) of an inch per twenty-four hours. The load for all other load steps including the zero (0) load at the end of the test shall be maintained constant for a period of not less than four (4) hours. Sufficient readings for each load step shall be made to define properly the time-deflection curve.

725.4 MEASUREMENTS: Observation of vertical movement shall be made so that the data will accurately define the progress of vertical displacement during the test.

725.5 ADDITIONAL REQUIREMENTS FOR SOIL BEARING TESTS: Bearing tests shall be applied at the elevations of the proposed bearing surfaces of the structure; except that the load may be applied directly on the surface of compacted granular material, class 14. The excavation immediately surrounding an area to be tested shall be made no deeper than one (1) foot above the plane of application of the test. The test plate shall be placed with uniform bearing. For the duration of the test, the material surrounding the test area shall be protected effectively against evaporation and frost action.

725.6 DETERMINATION OF DESIGN LOAD: The proposed design load shall be allowed provided that the requirements of section 725 are fulfilled and the settlements under the design load and twice the design load do not exceed three-eighths (3/8) of an inch and one (1) inch, respectively.

725.7 ADDITIONAL REQUIREMENTS FOR PILE LOAD TESTS: A single pile shall be load tested to not less than twice the design load. When two (2) or more piles are to be tested as a group, the total load shall be not less than one and one-half (1½) times the design load for the group.

Provided that the load-settlement curve shows no sign of failure and provided that the permanent settlement of the top of the pile after removal

of all load at the completion of the test does not exceed one-half (½) inch, the maximum design load shall be the load allowed in this part for the type of pile or one-half (½) of the maximum applied load, whichever is less.

Whenever the soil conditions are such that substantial driving resistance and/or significant support of the pile test load is derived from soil strata overlying the intended bearing stratum this support shall be removed or the results of the pile test shall be analyzed so as to evaluate the actual support furnished by the bearing stratum.

725.8 APPLICATION OF PILE LOAD TEST RESULTS: The results of the load test can be applied to other piles within the area of substantially similar sub-soil conditions as that for the test pile; and providing the performance of the test pile has been satisfactory and the remaining piles are of the same type, shape and size as the test pile; and are installed using the same methods and equipment and are driven into the same bearing strata as the load tested pile to an equal or greater penetration resistance.

725.9 SETTLEMENT ANALYSIS: Whenever a structure is to be supported by medium or soft clay (materials of classess 11 and 12), the settlements of the structure and of neighboring structures due to consolidation of the clay shall be given careful considereation, particularly if there are large variations in thickness of the clay or the structure has substantial variation in net load at foundation grade. The building official may require a settlement analysis to be made by a qualified registered professional engineer in case the live and dead loads of the structure, as specified in article 7, minus the weight of the excavated material, induce a maximum stress greater than three hundred (300) pounds per square foot at midheight of the underlying soft clay.

725.91 SETTLEMENT ANALYSIS COMPUTATIONS: The settlement analysis will be based on a computation of the net increase in stress that will be induced by the structure and realistically appraised live loads, after deducting the weight of excavated material under which the clay was fully consolidated. The effects of fill loads within the building area or fill and other loads adjacent to the building shall be included in the settlement analysis. The appraisal of the live loads may be based on surveys of actual live loads of existing buildings with similar occupancy. The soil compressibility shall be determined by a qualified registered professional engineer and approved by the building official.

SECTION 726.0 ALLOWABLE FOUNDATION PRESSURE

The maximum allowable pressures on foundation materials shall be in accordance with section 723.0 and as modified herein.

726.1 ROCK FOUNDATIONS: Where subsurface explorations at the project site indicate variations or doubtful characteristics in the structure of the rock upon which it is proposed to construct foundations, a sufficient number of borings shall be made to a depth of not less than ten (10) feet below the level of the footings to provide assurance of the soundness of the foundation bed and its bearing capacity.

726.2 BEARING PRESSURE ON ROCK: The tabulated bearing pressures for rocks of Classes 1 and 3, inclusive, shall apply where the loaded area is on the surface of sound rock. Where the loaded area is below such surface these values may be increased ten (10) percent for each foot of additional depth, but shall not exceed three (3) times the tabulated values.

726.3 BEARING PRESSURES FOR CLASSES 4 TO 9, INCLUSIVE: The allowable bearing pressures for materials of Classes 4 to 9, inclusive, may exceed the tabulated values by five (5) percent for each foot of depth of the loaded area below the minimum required in section 727 but shall not exceed twice the tabulated values. For areas of foundations smaller than three (3) feet in least lateral dimension, the allowable design bearing pressures shall be one-third (1/3) of the allowable bearing pressures multiplied by the least lateral dimension in feet.

726.4 BEARING PRESSURES ON CLAY: The tabulated bearing pressures for Classes 10 to 12, inclusive, shall apply only to pressures directly under individual footings, walls, and piers; and in case structures are founded on or are underlain by deposits of these classes, the total load over the area of any one bay or other major portion of the structure, minus the weight of all materials removed, divided by the area, shall not exceed one-half (½) the tabulated bearing pressures.

726.5 VERTICAL PRESSURES: The computed vertical pressure at any level beneath a foundation shall not exceed the allowable bearing pressures for the material at that level. Computation of the vertical pressure in the bearing materials at any depth below a foundation shall be made on the assumption that the load is spread uniformly at an angle of sixty (60) degrees with the horizontal; but the area considered as supporting the load shall not extend beyond the intersection of sixty (60) degree planes of adjacent foundations.

SECTION 727.0 SPREAD FOUNDATIONS

Except when erected upon sound bedrock or when protected from frost, foundation walls, piers and other permanent supports of all buildings and strucures shall extend a minimum of four (4) feet below finished grade; except as provided in section 727.21. Spread footings of adequate size shall be provided when necessary to properly distribute the load within the allowable bearing pressure of the soil.

727.1 DEPTH OF SPREAD FOUNDATIONS: The bottom surface of any footing resting on material of classes 4 to 15, inclusive, shall be at least eighteen (18) inches below the lowest ground surface or the surface of a bloor slab bearing directly on the soil immediately adjacent to the footing.

727.2 LIGHT STRUCTURES: One-story structures without masonry walls and not exceeding eight hundred (800) square feet in area may be founded on a layer of satisfactory bearing material not less than three (3) feet thick, which is underlain by highly compressible material, provided that the stresses induced in the unsatisfactory material by the live and dead loads of the structure and the weight of any ne fill, within or adjacent to the building area, will not exceed two hundred and fifty (250) pounds per square foot.

727.21 GRADE BEAMS: Grade beams of all structures may extend not more than one (1) foot below the adjoining surface exposed to natural freezing if the underlying soil to a depth of at least four (4) feet beneath the surface, and estending at least four (4) feet outside the building is sand, gravel, cinders, or other granular materials containing not more than five (5) percent (by weight) passing a No. 200 mesh sieve.

SECTION 728.0 FOOTING DESIGN

728.1 DESIGN LOADS: The loads to be used in computing the pressure upon bearing materials directly underlying foundations shall be the live and dead loads of the structure, as specified in section 820 including the weight of the foundations and of any immediately overlying material, but deducting from the resulting pressure per square foot the total weight of a one (1) squre foot column of soil, including the water in its voids, which extends from the lowest immediately adjacent surface of the soil to the bottom of the footing, pier or mat. Foundations shall be constructed so as to resist the maximum probable hydrostatic pressures.

728.2 PRESSURE DUE TO LATERAL LOADS: Where the pressure on the bearing material due to wind or other lateral loads is less than one-third (1/3) of that due to dead and live loads, it may be neglected in the foundation design. Where this ratio exceeds one-third (1/3), foundations shall be so proportioned that the pressure due to combined dead, live, wind loads, and other lateral loads shall not exceed the allowable bearing pressures by more than one-third (1/3).

728.3 EARTHQUAKE LOADS: Special provision shall be made in the foundation design to comply with the provisions of section 718.

728.4 VIBRATORY LOADS: Where machinery or other vibrations may be transmitted through the foundations, consideration shall be given in the design of the footings to prevent detrimental disturbances of the soil.

728.5 ECCENTRIC LOADS: Eccentricity of loadings in foundations shall be fully investigated, and the maximum pressure on the basis of straight-line distribution shall not exceed the allowable bearing pressures.

SECTION 729.0 TIMBER FOOTINGS

729.1 WHERE PERMITTED: Timber footings may be used only for wood frame structures. Such footings shall be placed entirely below the permanent water level unless the timber is treated in accordance with the provisions of section 738.0.

729.2 UNTREATED TIMBER: The compressive stresses perpendicular to the grain in untreated timber footings, supported on piles, with the pile cut off and the top of the footing and capping entirely below permanent ground water or mean low water level, shall not exceed seventy (70) percent of the allowable stresses for the species and grade of lumber in accordance with the provisions of section 851.

SECTION 730.0 STEEL GRILLAGES

Structural steel grillage foundations shall have at least six (6) inches of concrete cover below the bottom of the steel and shall have at least four (4) inches of concrete cover above the steel and between the sides of the steel and the adjacent soil.

SECTION 731.0 UNREINFORCED CONCRETE FOOTINGS

731.1 CONCRETE STRENGTH: Concrete in unreinforced foundation footings shall be so proportioned as to develop an ultimate compressive strength of not less than two thousand (2,000) pounds per square inch at twenty-eight (28) days.

731.2 PLACEMENT: No concrete for foundations shall be poured through water. When placed under or in the presence of water, the concrete shall be deposited by approved and properly operated equipment which insures minimum segregation of the mix and negligible turbulence of the water.

731.3 DIMENSIONS: In unreinforced concrete footings, the edge thickness shall be not less than twelve (12) inches for footings on soil or rock; except for wood frame buildings up to two (2) stories in height, these thicknesses may be reduced to eight (8) inches.

731.4 PROTECTION: Concrete footings shall be protected from freezing during construction and for a period of not less than five (5) days thereafter, and in no case shall water be allowed to flow through the deposited concrete.

SECTION 732.0 MASONRY UNIT FOOTINGS

732.1 DIMENSIONS: Masonry unit footings shall be laid in type M or S mortar complying with section 816 and the depth shall be not less

than twice the projection beyond the wall, pier or column; and the width shall be not less than eight (8) inches wider than the wall supported thereon.

732.2 OFFSETS: The maximum offset of each course in brick foundation walls stepped up from the footings shall be one and one-half (1 1/2) inches if laid in single courses, and three (3) inches if laid in double courses.

SECTION 733.0 REINFORCED CONCRETE FOOTINGS

733.1 DESIGN: Reinforced concrete foundations shall comply with section 842 and the applicable reference standards therein listed for the design of reinforced concrete.

733.2 PILE CAPS: The minimum distance from the edge of the cap to the nearest pile surface shall be six (6) inches and there shall be at least two (2) inches of concrete between the top of the pile and the steel reinforcement of the cap. The pile caps shall extend not less than three (3) inches below the pile cutoff.

733.3 PROTECTION: When the concrete is deposited directly against the ground, the reinforcement shall have a minimum cover of three (3) inches, at all other surfaces of foundation concrete, the reinforcement shall have a minimum cover of two (2) inches.

SECTION 734.0 FLOATING FOUNDATIONS

The design of floating foundations shall include a settlement analysis in accordance with the provisions of section 725.9.

SECTION 735.0 PILE FOUNDATIONS

735.1 SITE INVESTIGATION: In addition to the provisions of section 724.0, the building site shall be investigated for all conditions which might promote deterioration of pile foundations, and approved protective measures meeting the requirements of section 736.0 shall be taken to prevent corrosion or other destructive action from deleterious conditions.

735.2 SPACING: The minimum center-to-center spacing of piles shall be not less than twice the average diameter of a round pile, nor less than one and three-quarter (1 3/4) times the diagonal dimension of a rectangular pile. When driven to or penetrating into rock, the spacing shall be not less than twenty-four inches. When receiving principal support from end-bearing on materials other than rock or through frictional resistance, the spacing shall be not less than thirty (30) inches.

735.3 WALLS: All piles in wall foundations shall be staggered about the center line of the wall at a minimum distance of one-half (1/2) the top diameter therefrom. A foundation wall restrained laterally so as to ensure stability both during and after construction may be supported by a single row of piles.

735.4 ISOLATED COLUMNS: An isolated column when supported by piles shall rest upon not less than three (3) piles, at least one (1) of which is offset; except that for one (1) story buildings an isolated column may rest upon two (2) piles when its axis is not more than one and one-half (1 1/2) inches off the line connecting the centers of the two (2) piles; or upon a single pile when other than wood or wood-composite piles are used and its axis is not more than one and one-half (1 1/2) inches off the center of the pile, provided the top of the pile is laterally supported.

735.5 MINIMUM DIMENSIONS: Piles of uniform cross section shall have a minimum outside nominal dimension of ten (10) inches except as provided in section 739.2. Tapered concrete piles shall have a minimum butt diameter at cutoff of twelve (12) inches and a diameter of not less than eight (8) inches measured one (1) foot above the tip.

735.6 SPLICES: Splices shall be avoided insofar as practicable. Where used, splices shall be such that the resultant vertical and lateral loads at the splices are adequately transmitted. Splices shall be so constructed as to provide and maintain true alignment and position of the component parts of the pile during installation and subsequent thereto. The ends of each section of steel pipe or other steel elements shall be cut perpendicular to the axis and bearing surfaces shall be true-fitted with milled or ground faces or by flame cutting or other approved method. Splices shall develop one hundred (100) percent of the strength of pile section in whatever state of stress.

735.7 JETTING: Jetted piles shall be driven to the required load resistance as determined by the application of the approved pile driving formula in section 737.21, after the flow of jet water has stopped.

735.8 PRECAUTIONS: When piles have been damaged in driving, or driven in locations and alignment other than those indicated on the plans, or that have capacities less than required by the design, the affected pile groups and pile caps shall be investigated and if necessary, the pile groups or pile caps shall be redesigned or additional piles shall be driven to replace the defective piles. Piles shall be driven to embedment in the supporting stratum, as determined by borings.

735.9 PILE HEAVE: Adequate provision shall be made to observe pile heave, and where heaving of one-half (1/2) inch or more occurs, corrective measures shall be taken to ensure that the pile is adequate for its design use.

735.10 RECORDS: The owner shall engage a competent inspector, qualified by experience and training and satisfactory to the building official to be present at all times while piles are being driven and to inspect all work in connection with the piles. The inspector shall make an accurate record of the material and the principal dimensions of each pile, of the weight and fall of the ram, the type, size, and make of hammer, the number of blows per minute, the energy per blow, the number of blows per inch for the last six (6) inches of driving, together with the grades at point and cutoff. A copy of these records shall be filed in the office of the building official.

SECTION 736.0 CORROSION PROTECTION

Where boring records, previous experience, or site investigations indicate any condition which might promote deterioration or possible deleterious action on pile materials due to soil constituents, changing water levels or other causes, such pile materials shall be adequately protected as stated herein.

736.1 PRESERVATIVE TREATMENTS: The preservative treatment of timber piles shall comply with the provisions of section 738.0 and the reference standards of this article.

736.2 STEEL AND STEEL-CONCRETE PILES: At locations where steel and steel-concrete piles will be in contact with any material which is corrosive to the steel, one of the following procedures shall be used for protection, or any other method which will satisfy the requirements of the building official:

a) remove all objectionable material.

b) effectively protect the steel surface from pile cutoff grade to a grade fifteen (15) feet below the bottom of the objectionable material by means of:

   1) cathodic protection as approved by the building official; or

   2) an approved encasement of not less than three (3) inches of dense concrete; or

   3) an effective protective coating subject to the approval of the building official; or

   4) providing an excess thickness of one-eighth (1/8) inch beyond design requirements on all exposed surfaces.

SECTION 737.0 ALLOWABLE PILE LOADS

The allowable load on piles shall be determined by the applicable formulas complying with accepted engineering practice and as stated

herein. The maximum load capacity shall be limited by the supporting capacity as obtained from bearing upon or embedment in bearing materials as defined in sections 723 and 726, but in no case shall the load exceed the capacity of the pile designed in accordance with the provisions of section 737.1 and the requirements of article 8 for the construction materials involved.

737.1 LATERAL SUPPORT OF AXIALLY LOADED PILES: The length of a pile below the ground surface shall be considered as a plain column with continuous lateral support. The length above the ground surface shall be designed as an unsupported column in accordance with the provisions of section 746.

737.2 DETERMINATION OF ALLOWABLE LOAD: In the absence of capacities based on load tests, except for the type of piles covered in sections 740.2 and 742.0, the load on a single pile shall not exceed the higher of the two (2) values determined in accordance with sections 737.2 and 737.22, nor the maximum loads on piles as provided in section 737.23.

737.21 DRIVING FORMULA:

a) Where the design load capacity of the pile does not exceed fifty (50) tons, the allowable load may be computed by means of the following driving formula:

$$R = 2E/(S + C)$$

where

R = allowable pile load in pounds
E = energy per blow in foot pounds
S = penetration of last blow or average penetration of last few blows experienced in inches
C = Constant equal to 1.0 for drop hammer and 0.1 for steam or air hammer.

b) When the design load capacity of a pile exceeds fifty (50) tons the required driving resistance shall be increased above that required by the driving formula in section 737.21a, based on load tests or past experience under similar conditions.

c) The value of "s" must be determined with the hammer operating at one hundred (100) percent of the rated number of blows per minute for which the hammer is designed.

d) Any driving resistance developed in strata overlying the bearing material shall be discounted.

e) If the driving of the pile has been interruped for more than one (1) hour, the value of "s" shall not be determined until

the pile is driven at least an additional twelve (12) inches, except when it encounters refusal on or in a material of classes 1 to 5 inclusive.

f) When the constant tapered portion of a pile, including a timber pile, is driven through a layer of gravel, sand or hard clay (classes 6 to 10 inclusive, and class 14) exceeding five (5) feet in thickness, and through an underlying soft stratum, the bearing capacity shall not be determined in accordance with the driving formula, unless jetting is used during the entire driving of the tapered portion of the pile through the layer of gravel, sand, hard clay or class 14 material, or unless a hole is pre-excavated through said layer for each pile.

737.22 FRICTION FORMULA IN CLAY: The allowable load on a pile stopped in inorganic clay may be based on a friction value of five hundred (500) pounds per square foot of embedded pile surface for a design load not to exceed twenty-two (22) tons, or on a friction value determined from pile load tests. The embedded length shall be the length of the pile below the surface of the inorganic clay, or below the surface of immediately-overlying satisfactory bearing material. The area of embedded pile surface shall be computed by multiplying the embedded length by the perimeter of the smallest circle or polygon that can be circumscribed around the average section of the embedded length of the pile. The method of determining the allowable load described in this paragraph shall not be used for a pile in which the drive-pipe is withdrawn or for piles which are driven through the clay to or into firmer bearing materials.

In case these piles are in clusters the allowable load shall be computed for the smaller of the following two (2) areas: (1) the sum of the embedded pile surfaces of individual piles; (2) the area obtained by multiplying the perimeter of the polygon circumscribing the cluster at the surface of the satisfactory bearing material by the average embedded length of pile.

737.23 JACKED PILES: The allowable load on a single pile installed by jacking shall not exceed one-half (1/2) the load applied to the pile at the completion of jacking, provided that the final load is kept constant for a period of four (4) hours and that the settlement during that period does not exceed one-twentieth (1/20) of an inch.

737.3 NEGATIVE FRICTION: Where a pile or a group of piles is placed in subsiding fill or soil, the effect of the downward frictional forces shall be given consideration in the design.

737.4 LIMITING LOAD: Where weaker materials underlie the bearing material into which the piles are driven, the allowable pile load shall be limited by the provision that the vertical pressures in such underlying materials produced by the loads on all piles in a foundation shall not exceed the allowable bearing pressures of such materials as

established by analysis, applying accepted principles of soil mechanics. Piles or pile groups shall be assumed to transfer their loads to the underlying materials by spreading the load uniformly at an angle of sixty (60) degrees with the horizontal, starting at a polygon circumscribing the piles at the top of the satisfactory bearing material in which they are embedded; but the area considered as supporting the load shall not extend beyond the intersection of the sixty (60) degree planes of adjacent piles or pile groups.

737.41 PILE LOAD LIMITATION: The allowable load on a pile shall not be limited to the load obtained by multiplying its point area by the allowable bearing pressure given in section 723.0.

SECTION 738.0 TIMBER PILES

738.1 SPECIES: Piles shall be of type I species, type II species or other species approved for such use by the building official.

a) type I species shall include southern yellow pine, oak, Douglas fir and other woods of similar strength and physical characteristics.

b) type II species shall include Norway pine, spruce and other woods of similar strength and physical characteristics.

738.2 QUALITY REQUIREMENTS: The quality of all round timber piles shall at least conform to class A and B, round timber piles listed in the reference standards of this article.

Round timber piles shall be cut above the ground swell, have a continuous taper from the point of butt measurement to the tip and be free from decay, red heart or insect attack. All knots and limbs shall be trimmed or smoothly cut flush with the surface of the pile or swell surrounding the knot. A straight line from the center of the butt to the center of the tip shall lie entirely within the body of the pile. The axis of a wood pile shall not deviate from a straight line more than one (1) inch for each ten (10) feet of length. Short crooks shall not deviate more than two and one-half (2 1/2) inches in five (5) feet. Spiral grain shall not exceed one-half (1/2) of a complete twist in any twenty (20) feet of length; unsound or cluster knots are prohibited and splits and shakes are limited.

738.3 MINIMUM DIMENSIONS:

a) piles shall be of adequate size to resist the applied loads without having to endure compressive stress parallel with the grain in excess of the following:

1) six hundred (600) pounds per square inch for type I species of wood or four hundred twenty-five (425) pounds per square inch for type II species of wood on the pile cross section

located at the surface of the bearing stratum for piles driven into materials of classes 6 through 10.

2) three hundred sixty (360) pounds per square inch for type I species of wood or two hundred fifty-five (255) pounds per square inch for type II species of wood on the pile cross section at the tips of piles driven to bearing on materials of classes 1 through 5.

b) the piles shall measure at least six (6) inches in diameter at the tip and at least ten (10) inches in diameter at the cutoff, with these measurements being taken under the bark.

c) all piles shall be driven in one (1) piece except as provided in section 744.0 for composite piles.

738.4 CUTOFF: The tops of all timber piles shall be cut off in a horizontal plane; and if not treated by an approved preservative process, the cutoff shall be below mean low water level or lowest ground water level, and shall be subject to the building official's approval. He may require the owner to install and maintain in good condition at least one (1) ground water observation well within the building, which shall be accessible to the building official.

738.5 TREATED PILES: Timber piles pressure-treated with creosote or creosote-coal-tar solution, and conforming to the requirements of this section, may be cut off above permanent ground water level when used for the support of buildings not exceeding two (2) stories in height.

738.51 TREATMENT: Creosoted wood piles of southern yellow pine, Douglas fir, red oak or Norway pine shall be creosoted under pressure in accordance with the reference standards of this article to a final net retention of not less than twenty (20) pounds per cubic foot of creosote for piles exposed to sea water and not less than twelve (12) pounds of creosote per cubic foot for piles for other normal exposure. The tops of such piles at cutoff shall be given three (3) coats of hot creosote, followed by a coat of coal-tar pitch; and the cutoff shall be made in sound wood and be encased not less than three (3) inches in the concrete pile cap.

738.52 CERTIFICATION: Before any treated piles are driven, the building official shall be furnished with certification by a licensed testing laboratory, certifying that piles were free of decay, were properly peeled and otherwise prepared before treatment; and that the method of treatment, the chemical composition and the amount of retention of the preservative conform to the requirements of this section.

738.6 MAXIMUM LOAD ON WOOD PILES: The load on a wood pile shall not exceed the allowable load specified in section 737. For timber piles driven into material of classes 6 through 10, the area at the surface

of the bearing stratum shall be used to compute the allowable load. The maximum load on a timber pile shall not exceed thirty-five (35) tons.

738.7 PRECAUTIONS IN DRIVING: To avoid damage to the pile, the size of the hammer shall be such that the driving energy in foot-pounds per blow shall not exceed numerically the point diameter of the pile in inches multiplied by fifteen hundred (1500). The total driving energy in foot-pounds for six (6) inches of penetration shall for all types of hammers be numerically no greater than the point diameter in inches times thirty-two thousand (32,000) for type I species of wood or times twenty-two thousand (22,000) for type II species of wood. For the last inch of penetration, the energy in foot-pounds shall not exceed numerically the point diameter in inches multiplied by six thousand (6,000). In any case, driving shall be stopped immediately when abrupt high resistance to penetration is encountered. Any sudden decrease in driving resistance shall be investigated with regard to the possibility of breakage of the pile; and if such sudden decrease in driving resistance cannot be correlated to boring data, and if the pile cannot be removed for inspection, it shall be considered adequate reason for rejection of the pile.

SECTION 739.0 PRECAST CONCRETE PILES

739.1 CONCRETE STRENGTH: No precast concrete pile shall be driven before the concrete has attained a compressive strength of not less than four thousand (4,000) pounds per square inch based on tests of cylinders cast from the same batches and cured under the same conditions as the pile concrete. These piles shall be so proportioned, cast, cured, handled and driven as to resist without significant cracking the stresses induced by handling and driving as well as by loads.

739.2 DESIGN: The piles shall be designed and reinforced in accordance with the applicable reinforced concrete regulations cited in section 842.0. If for any reason the pile is injured, or the reinforcement is exposed, its use shall be condemned. The lateral reinforcement at both ends of the pile shall be spaced sufficiently close to resist impact stresses due to driving and in no case more than three (3) inches on center. When driven to or into bearing materials of classes 1 to 5 inclusive, or through materials containing boulders, they shall have metal tips of approved design. The minimum lateral dimension of a precast concrete pile shall be ten (10) inches.

739.3 LIMITATION OF LOAD: The load on a precast concrete pile shall not exceed the allowable load specified in section 737 nor twenty-five (25) percent of the twenty-eight (28) day strength of the concrete, but not exceeding twelve hundred (1200) pounds per square inch. For prestressed concrete piles twenty-five (25) percent of the effective prestress in the concrete after losses shall be deducted from twenty-

five (25) percent of the twenty-eight (28) day strength or twelve hundred (1200) pounds, whichever is less, in computing the maximum pile load.

739.4 PROTECTION: A minimum covering of two (2) inches of concrete shall be provided over all reinforcements, except that for piles to be exposed to sea water and other severe environments, a three (3) inch protective covering shall be furnished in the zone of such exposure.

739.5 MINIMUM SPACING: The minimum spacing center-to-center of precast concrete piles shall be two and one-half (2 1/2) times the square root of the cross-sectional area at the butt.

739.6 SPLICES: Splices shall not be permitted in precast concrete piles.

SECTION 740.0 CAST-IN-PLACE CONCRETE PILES

In this section a distinction is made between poured-concrete piles and compacted-concrete piles. A poured-concrete pile is formed by pouring concrete into a driven casing that is permanently installed in the ground. A compacted-concrete pile is formed by placing concrete having a zero (0) slump, in small batches, and compacting each batch. All cast-in-place concrete piles shall be so made and placed as to ensure the exclusion of all foreign matter and to secure a well-formed unit of full cross-section. The minimum strength of concrete for cast-in-place piles shall be three thousand (3000) pounds per square inch. While placing the concrete the casing or drive-pipe shall contain not more than three (3) inches of water.

740.1 POURED CONCRETE PILES

740.11 DESIGN: The shape of the pile may be cylindrical, or conical, or a combination thereof, or it may be a succession of cylinders of equal length, with the change in diameter of adjoining cylinders not exceeding one (1) inch.

740.12 LOADING: The load on poured-concrete piles shall not exceed the allowable load specified in 737 nor twenty-five (25) percent of the twenty-eight (28) day strength of the concrete, but not exceeding eleven hundred (1100) pounds per square inch, when applied to the cross-sectional area computed on the following bases:

a) For metal-cased piles driven to and into materials of classes 1 to 4 inclusive, using the diameter measured one (1) foot above the point, except that when the rock is immediately overlain by a bearing stratum consisting of one (1) or a combination of bearing materials of classes 5, 6 and 7, using the diameter at the surface of the bearing stratum.

b) For metal-cased piles, driven through compressible materials including classes 11, 12, 13 and 15 and into a bearing stratum consisting of one (1) or a combination of bearing materials of classes 5 to 10 inclusive, using the diameter at the surface of the bearing stratum.

740.13 INSTALLATION: Immediately before filling with concrete, the inside of the casing shall be thoroughly cleaned to the bottom and subjected to a visual examination. The casing shall be subject to the following limitations:

a) the diameter shall not vary more than twenty (20) percent from the specified value;

b) the point of the casing shall not deviate more than ten (10) percent of the length of the pile from the design alignment; and

c) the casing shall not deviate by more than four (4) percent of the length of the casing from the straight line connecting the mid-points of the ends of the casing. Any other condition which may affect the design performance shall be duly noted and evaluated subject to the requirements of the building official. No casing or drive-pipe shall be filled with concrete until all casings or drive-pipes within a radius of seven (7) feet, or within the heave range, whichever is greater, have been driven to the required resistance.

740.2 COMPACTED CONCRETE PILES

740.21 LOADING: The load on compacted concrete piles shall be limited by the provisions of section 737.41 except that the circumscribing polygon shall start at the junction of the shaft and the enlarged base, and the bearing area shall be taken at planes six (6) feet or more below said junction; and the allowable load on a compacted concrete pile shall not exceed one hundred forty (140) tons.

740.22 INSTALLATION: The installation of such piles shall fulfill the following-listed requirements:

a) The drive-pipe used for installing the piles shall be not less than twenty (20) inches outside diameter for piles which have an allowable load of eight-five (85) tons or greater, and not less than sixteen (16) inches outside diameter for piles which have an allowable load of less than eighty-five (85) tons. For loads less than fifty (50) tons, smaller drive casings may be used subject to the approval of the building official.

b) The enlarged base of the pile shall be formed on or in bearing materials of classes 1 to 9 inclusive. The class 9 material (fine sand) shall have a maximum of six (6) percent by weight

finer than the No. 200 mesh sieve and shall be non-plastic.

c) The concrete in the base shall have a minimum compressive strength at twenty-eight (28) days of four thousand (4,000) pounds per square inch, shall be of zero (0) slump, and shall be placed in batches not to exceed five (5) cubic feet in volume.

d) The last batch of concrete shall be driven into the enlarged base with not less than twenty-five (25) blows, each of not less than one hundred and forty thousand (140,000) foot pounds. For lower allowable loads, the required number of blows on the last batch shall vary in proportion to the allowable load. On the basis of test data, and subject to approval by the building official, the hammer blow energy may be reduced, in which case the number of blows on the last batch shall vary inversely with the energy delivered per blow.

e) During injection of the last five (5) cubic feet the level of concrete in the drive casing shall be not more than six (6) inches above the bottom of the casing.

f) As the drive-pipe is being withdrawn, not less than two (2) blows of at least forty thousand (40,000) foot-pounds each shall be applied to compact each batch of concrete in an uncased shaft.

g) An uncased shaft shall not be formed through inorganic clay or inorganic silt unless a hole is made through such soil by a non-displacement method, at least equal to the inside diameter of the drive-pipe unless the individual piles are located more than nine (9) feet apart and outside the heave range. Compacted concrete piles shall have cased shafts when spaced closer than nine (9) feet apart and when installed through inorganic clay or inorganic silt.

h) An uncased shaft shall not be formed through peat or other organic soils.

i) The permanent metal casing shall be fastened to the enlarged base in such a manner that the two (2) will not separate. The concrete may be placed in the metal casing in the same manner as for poured-concrete piles. No metal casing shall be filled with concrete until after all piles within a radius of at least nine (9) feet have been driven. The stresses in metal-cased shafts shall not exceed eleven hundred (1100) pounds per square inch on the concrete, and in addition, nine-thousand five hundred (9,500) pounds per square inch on the steel casing, provided that its wall thickness is at least two-tenths (2/10) of an inch. When required by soil conditions, allowance shall be made for corrosion as specified in section 738.

740.23 SPACING: The center-to-center spacing of piles shall be not less than three (3) times the shaft diameter and not less than three and one-half (3 1/2) feet.

SECTION 741.0 CONCRETE-FILLED PIPE PILES

741.1 INSTALLATION: Immediately before filling with concrete, the inside of the casing shall be thorough cleaned to the bottom and subjected to a visual inspection. The casing shall be subject to the following limitations:

a) the diameter shall not vary more than twenty (20) percent from the specified value;

b) the point of the casing shall not deviate more than ten (10) percent of the length of the pile from the design alignment; and

c) the casing shall not deviate by more than six (6) percent of the length of the casing from the straight line connecting the mid-points of the ends of the casing. Any other condition which may affect the design performance shall be duly noted and evaluated subject to the requirements of the building official. Concrete shall not be placed through water; except that the building official may approve the use of a properly operated tremie or pumped concrete in still water, provided the pipe is proven to be free of other material.

741.2 STEEL PIPE: All steel pipe shall conform to the applicable standards listed in the reference standards of this article for welded and seamless steel pipe and tubes, and for hot-rolled carbon steel sheets. The yield point used in the design of steel casings shall be that of the fabricated element as determined by test.

741.3 DESIGN: The load on concrete-filled pipe piles shall not exceed the allowable load determined in accordance with section 737.0, nor a load computed on the basis of stress in concrete at twenty-five (25) percent of the twenty-eight (28) day strength, but not exceeding eleven hundred (1100) pounds per square inch, and stress in the steel at nine thousand (9,000) pounds per square inch; nor shall the load carried by the steel on this basis exceed one-half (1/2) the total load on the pile.

741.4 MINIMUM THICKNESS: The minimum wall thickness of all load-bearing pipe, tubes and shells shall be one-tenth (1/10) inches. When required by soil conditions, allowance shall be made for corrosion as specified in section 736.

741.5 SPLICES: All splices of the steel section shall be welded to one hundred (100) percent of the strength of the pipe and otherwise shall comply with section 735.6 and shall be designed to insure true

alignment of the pipe and uniform transmission of load from one (1) pipe length to another.

SECTION 742.0 CONCRETE-FILLED PIPE WITH STEEL CORE (DRILLED-IN-CAISSONS)

742.1 CONSTRUCTION: These units shall consist of a shaft section of concrete-filled pipe extended to and firmly seated in bedrock of classes 1 or 2 with an uncased socket drilled into the bedrock which is filled with cement grout. The steel core shall be centered in the shaft and shall extend through the cement grout to the bottom of the socket.

742.2 STEEL SHELL: The steel shell shall be seamless or welded steel pipe with a minimum yield point of thirty-three thousand (33,000) pounds per square inch, fitted with an approved cutting shoe and structural cap, or with other approved means of transmitting the superstructure load. The minimum diameter for drilled caissons shall be twenty-four (24) inches and minimum shell thickness five-sixteenths (5/16) inches. Steel shall be protected under the conditions specified in section 738. Splices shall be welded to develop one hundred (100) percent of the strength of the pipe.

742.3 CONCRETE FILL: The concrete fill of caissons shall be controlled concrete with a minimum compressive strength of four thousand (4,000) pounds per square inch at twenty-eight (28) days. It shall be so placed that it shall fill completely the space between the steel core and the pipe. In case the socket cannot be kept free from inflow of water, the pipe shall be filled to its top with clean water before placing the cement grout. The details of the design and installation, including the cleaning and inspection of the socket, the placement of concrete under water or in the dry, the method of centering the steel core, and all other phases of the work shall be submitted to the building official for approval.

742.4 ROCK SOCKET: A socket, approximately the inside diameter of the pipe, shall be made in bedrock of classes 1 or 2 to a depth that will assure load transfer when computed for a bearing on the bottom surface of the socket in accordance with sections 725 and 728 acting together with a bond stress on the perimeter surface of the socket of one hundred (100) pounds per square inch. Before placement of concrete the socket and pipe shall be thoroughly cleaned and the rock inspected by a qualified registered professional engineer.

742.5 STEEL CORE: The steel core shall consist of a structural steel member. The mating ends of the sections shall be spliced so to safely withstand the stresses to which they may be subjected. The minimum clearance between structural core and shell shall be two (2) inches. When such cores are installed in more than one (1) length, they shall be assembled to develop the full compressive strength of the section.

742.6 DRIVING PRECAUTIONS: No drilled caissons shall be driven more than two (2) percent of the length out of plumb.

742.7 SPACING: The minimum center-to-center spacing shall be not less than two and one-half (2 1/2) times the outside diameter of the steel shell.

742.8 ALLOWABLE LOAD: The load on concrete-filled pipe piles with steel cores shall not exceed the allowable load determined in accordance with the provisions of section 744.4 nor that computed on the basis of eleven hundred (1100) pounds per square inch on the area of the concrete plus nine thousand (9,000) pounds per square inch on the net area of the steel pipe plus sixteen thousand (16,000) pounds per square inch on the area of the steel core.

SECTION 743.0 STRUCTURAL STEEL PILES

743.1 STEEL: Steel sections may be of any type of steel permitted by the provisions of the reference standards of this article.

a) Rolled structural steel piles shall be of H form, with flange projection not exceeding fourteen (14) times the minimum thickness of metal in either flange or web and with total flange width at least eighty-five (85) percent of the depth of the section. No section shall have a nominal thickness of metal less than four-tenths (4/10) inch, nor a nominal depth in the direction of the web of less than eight (8) inches.

b) The use of built-up sections or sections of other than H form will be permitted if the several components of the section are adequately connected to develop the strength of the adjacent components and if the ratio of width to thickness of the component parts does not exceed the values for conventional H sections.

c) The tips of all steel H piles having a thickness of metal less than five-tenths (5/10) inches which are driven to end bearing on rock of class 1 through 3 by an impact hammer, shall be reinforced. The installation of all steel H piles by impact hammer to end bearing on rock of classes 1 through 3 shall be conducted so as to terminate driving directly when the pile reaches refusal on the rock surface.

d) Structural caps shall be rigidly attached to the pile section and shall be designed to transfer the full load into the piles; except that when the pile extends into the footing sufficiently to develop the full load by bond, or to permit the use of mechanical devices to develop the full load by shear, structural caps shall not be required.

743.2 SPLICES: If piles are spliced, the splice shall develop one hundred (100) percent of the strength of the section.

743.3 PROTECTION: Structural steel piles shall be protected under the conditions specified in section 736 or due allowance shall be made for corrosion as therein specified.

743.4 ALLOWABLE LOAD: The load on such piles shall not exceed the allowable load determined in accordance with section 737, nor a load based on stress of eleven thousand (11,000) pounds per square inch on the cross-section.

SECTION 744.0 COMPOSITE PILES

744.1 DESIGN: A composite pile shall consist of a combination of not more than two (2) of any of the different types of piles provided for in this part. The pile shall fulfill the requirements for each type, and in addition the provisions of this section. The requirements of section 740.13 shall apply to the entire length of a pipe-shell composite pile.

744.2 LIMITATION OF LOAD: The allowable load on composite piles shall be that allowed for the weaker of the two (2) sections. For wood-composite piles the allowable load shall not exceed eighty (80) percent of that allowed for the wood section alone. Wood-shell composite piles shall not be used for support of buildings exceeding two (2) stories in height.

744.3 SPLICES: Splices between concrete sections and steel or wood sections shall be designed to prevent separation of the sections both before and after the concrete portion has set, and to insure the alignment and transmission of the total pile load. Splices shall be designed to resist uplift due to upheaval during driving of adjacent piles and shall develop the full compressive strength and not less than fifty (50) percent of the strength in tension and bending of the weaker section.

744.4 SPACING: The center-to-center spacing shall be governed by the larger of the spacings required in this part for the types composing the pile.

SECTION 745.0 SPECIAL PILES AND CAISSONS

Types of piles or caissons not specifically covered by the provisions of this Code may be permitted subject to the approval of the building official, provided sufficient test data, design and construction information are filed by a qualified registered professional engineer certifying that the pile or caisson installation is adequate to fulfill the design requirements.

SECTION 746.0 LATERAL SUPPORT

746.1 SURROUNDING MATERIALS: Any soil other than water or fluid soil shall be deemed to afford sufficient lateral support to permit the

design of any type of pile as a short column. When piles are driven through soil which will be removed subsequently at the completion of the foundation, the resistance offered by such material shall not be considered to contribute to the lateral supporting capacity.

746.2 COLUMN ACTION: The portion of a pile or pier that is not laterally supported shall be designed as a column in accordance with section 842 and taking into consideration the conditions of end fixity.

SECTION 747.0 FOUNDATION PIERS

A foundation pier is here defined as a structural member which extends to a satisfactory bearing material, and which may be constructed in an excavation that afterwards is backfilled by an approved method, or by filling the excavation with concrete, or which may be built by sinking an open or pneumatic caisson.

747.1 MANNER OF CONSTRUCTION: The manner of construction shall be by non-displacement methods and shall permit inspection of the bearing material in place.

747.2 BASE ENLARGEMENT: The bases of foundation piers may be enlarged by spread footings, pedestals or belled bottoms.

747.21 BELLED BASES: Bell-shaped bases shall have a minimum edge thickness of four (4) inches. The bell roof shall slope not less than sixty (60) degrees with the horizontal unless the base is designed in accordance with section 841 or 842.

747.3 DESIGN OF PIERS: Foundation piers may be designed as concrete columns with continuous lateral support. The unit compressive stress in the concrete at the least cross section shall not exceed twenty-five (25) percent of the twenty-eight (28) day strength of the concrete nor eleven hundred (1100) pounds per square inch.

747.31 When the center of the cross section of a foundation pier at any level deviates from the resultant of all forces more than one-sixtieth (1/60) of its height, or more than one-tenth of its diameter, it shall be reinforced as provided in section 842. The restraining effect of the surrounding soil may be taken into account.

747.4 PLACEMENT: With approval of the building official, concrete may be placed through still water by means of a properly operated tremie or pumped concrete.

747.5 INSPECTION: The owner shall engage a competent inspector, qualified by experience and training and satisfactory to the building official, to be present at all times while foundation piers are being installed, to inspect and approve the bearing soil and the placing of the concrete. The inspector shall make a record of the type of

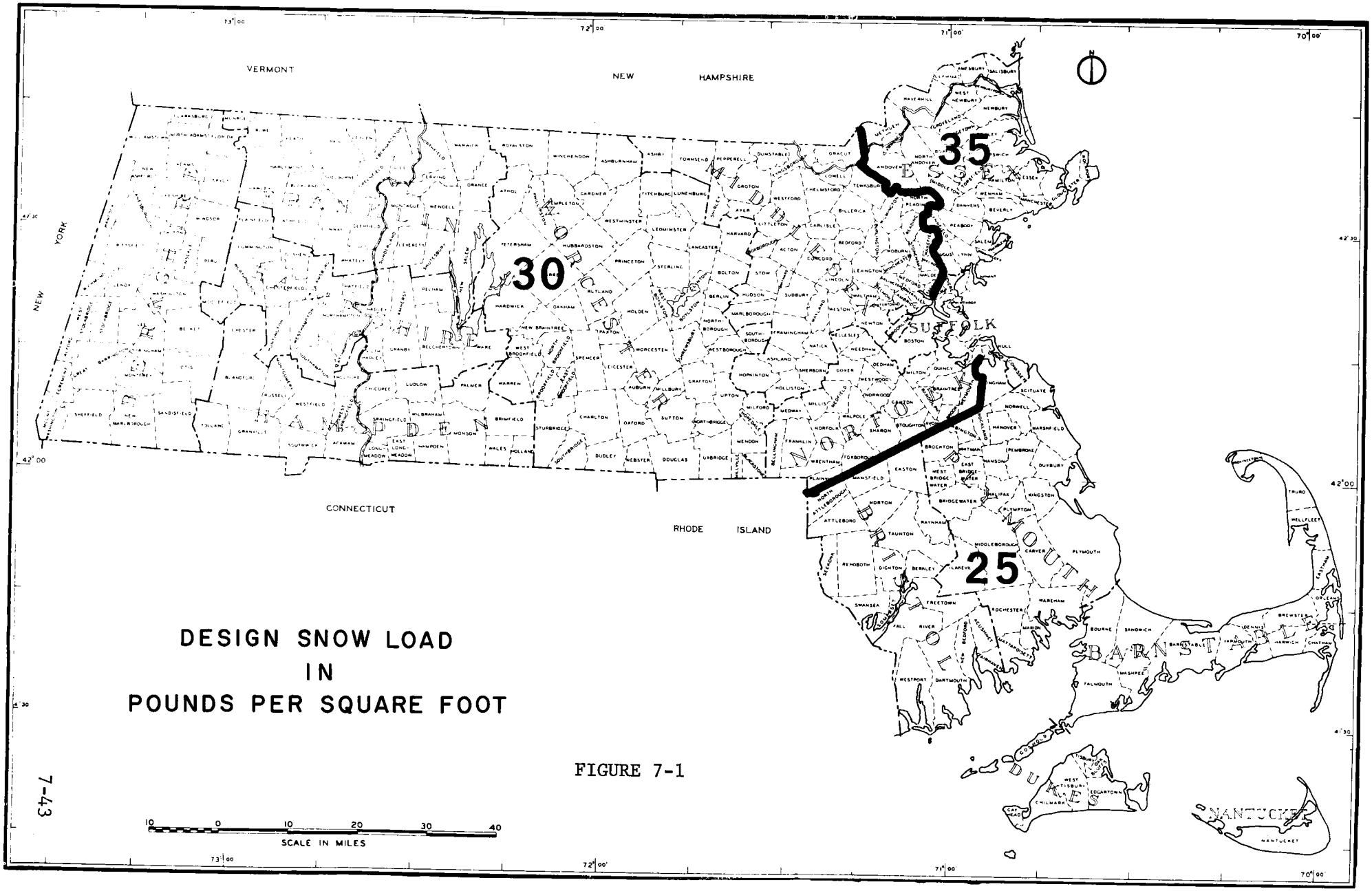
bearing soil upon which the pier rests, of the dimensions of the pier, and of the class of concrete used in its construction. A copy of these records shall be filed in the office of the building official.

SECTION 748.0 DESIGN REQUIREMENTS FOR FLOODPLAINS

748.1 STRUCTURAL REQUIREMENTS: Where a structure is located in an area designated by the authority having jurisdiction as a floodplain area, such a structure shall be designed to retain its structural integrity and stability for the anticipated flood conditions. Any such structure, including one and two-family dwellings, shall have plans submitted by a qualified registered professional engineer or architect showing only those provisions necessary in the construction of the structure to meet the following performance requirements:

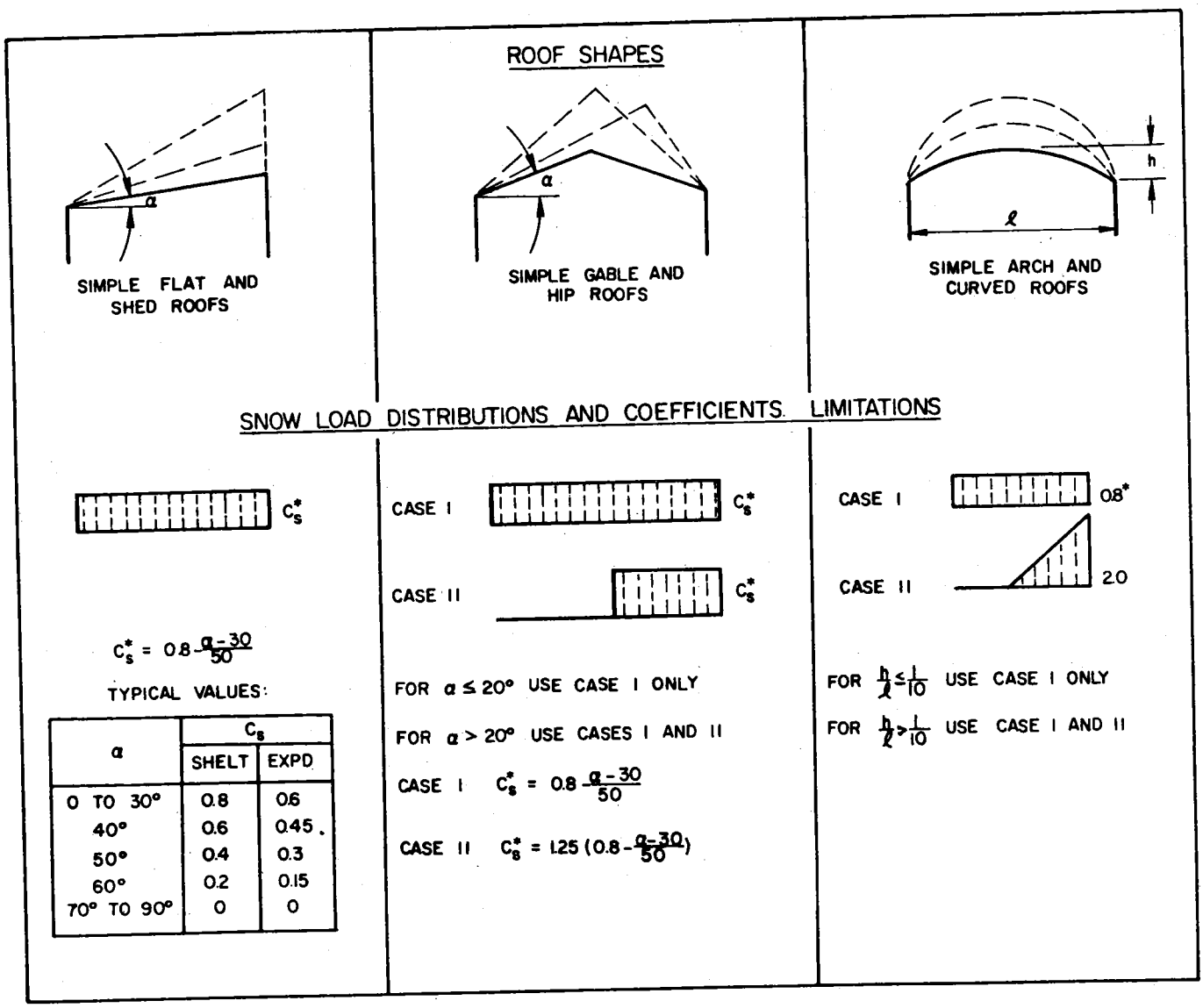
a) either elevate structures and/or design same to assure protection from hydrostatic or hydrodynamic loadings from anticipated flood levels;

b) design all structures to be safeguarded from collapse and/or flotation.



DESIGN SNOW LOAD IN POUNDS PER SQUARE FOOT

FIGURE 7-1



α	C_s	
	SHELT	EXPD
0 TO 30°	0.8	0.6
40°	0.6	0.45
50°	0.4	0.3
60°	0.2	0.15
70° TO 90°	0	0

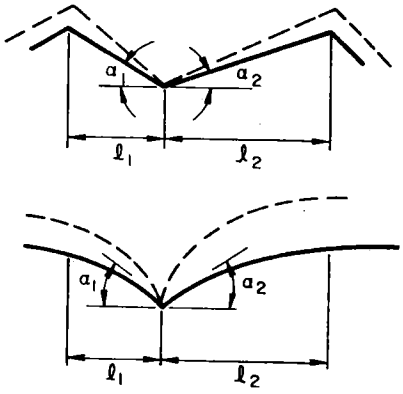
*For roofs conforming to wind exposure requirements of 712.21, all values of C_s marked with an asterisk (*) may be reduced 25%.

The term $\frac{a - 30}{50}$ is valid only for a >30 degrees.

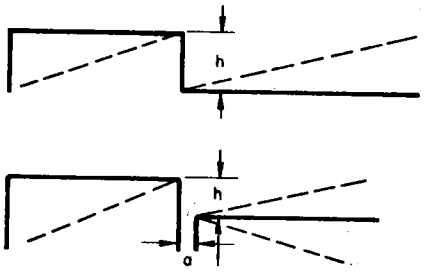
FIGURE 7-2

SNOW LOAD DISTRIBUTION AND COEFFICIENTS

ROOF SHAPES

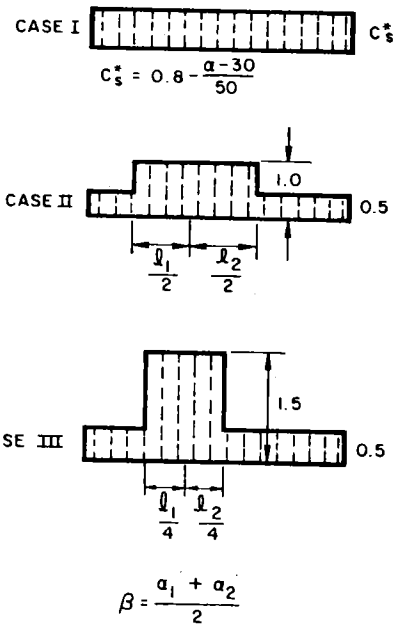


VALLEY AREAS OF TWO-SPAN AND MULTIPLE SERIES SLOPED OR CURVED ROOFS

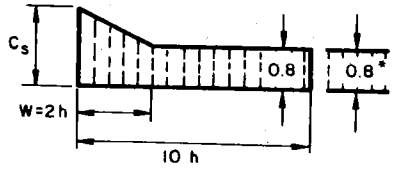


LOWER LEVEL OF MULTI-LEVEL ROOFS (WHEN UPPER ROOF IS PART OF THE SAME BUILDING OR ON AN ADJACENT BUILDING NOT MORE THAN 15 ft AWAY)

SNOW LOAD DISTRIBUTIONS AND COEFFICIENTS. LIMITATIONS



FOR $\beta \leq 10°$ USE CASE I ONLY
FOR $10° < \beta < 20°$ USE CASE I AND II
FOR $\beta \geq 20°$ USE CASE I, II AND III



$C_s = 15 \frac{h}{g}$

WHEN $15 \frac{h}{g} < 0.8^*$ USE $C_s = 0.8^*$

WHEN $15 \frac{h}{g} > 3.0$ USE $C_s = 3.0$

$W = 2h$

WHEN $h < 5$ ft USE $W = 10$ ft
$h > 15$ ft USE $W = 30$ ft

h = DIFFERENCE OF ROOF HEIGHTS IN ft
g = GROUND SNOW LOAD IN psf
W = WIDTH OF DRIFT FROM HIGHER BUILDING IN ft
a = DISTANCE BETWEEN BUILDINGS < 15ft.

DESIGN UPPER ROOF FOR LOADS APPLICABLE TO SINGLE-LEVEL ROOFS

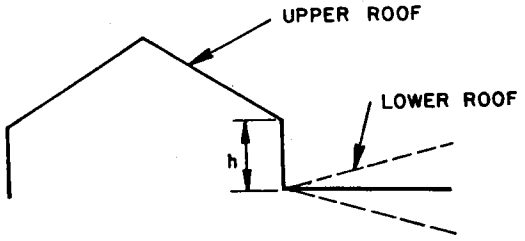
*For roofs conforming to wind exposure requirements of 712.21, all values of C_s marked with an asterisk (*) may be reduced 25%.

The term $\frac{a - 30}{50}$ is valid only for $a > 30$ degrees.

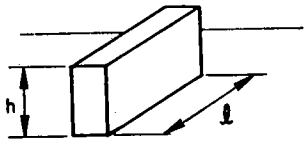
FIGURE 7-3

SNOW LOAD DISTRIBUTIONS AND COEFFICIENTS

ROOF SHAPES

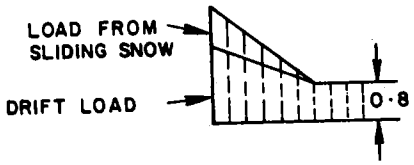


LOWER OF MULTI-LEVEL ROOFS WITH UPPER ROOF SLOPED TOWARDS LOWER ROOF



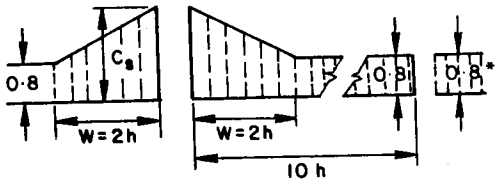
ROOF AREAS ADJACENT TO PROJECTIONS AND OBSTRUCTIONS ON ROOFS

SNOW LOAD DISTRIBUTIONS AND COEFFICIENTS. LIMITATIONS



DESIGN LOWER ROOF FOR LOADS APPLICABLE TO MULTI-LEVEL ROOFS PLUS A PORTION OF THE SLIDING SNOW FROM THE UPPER ROOF (SEE APPENDIX A7.2.1)

DESIGN UPPER ROOF FOR LOADS APPLICABLE TO SINGLE-LEVEL ROOFS



$C_s = 10\frac{h}{g}$

WHEN $10\frac{h}{g} < 0.8^*$ USE $C_s = 0.8^*$

WHEN $10\frac{h}{g} > 2.0$ USE $C_s = 2.0$

WHEN $\ell < \frac{g}{6}$ USE $C_s = 0.8^*$

$W = 2h$

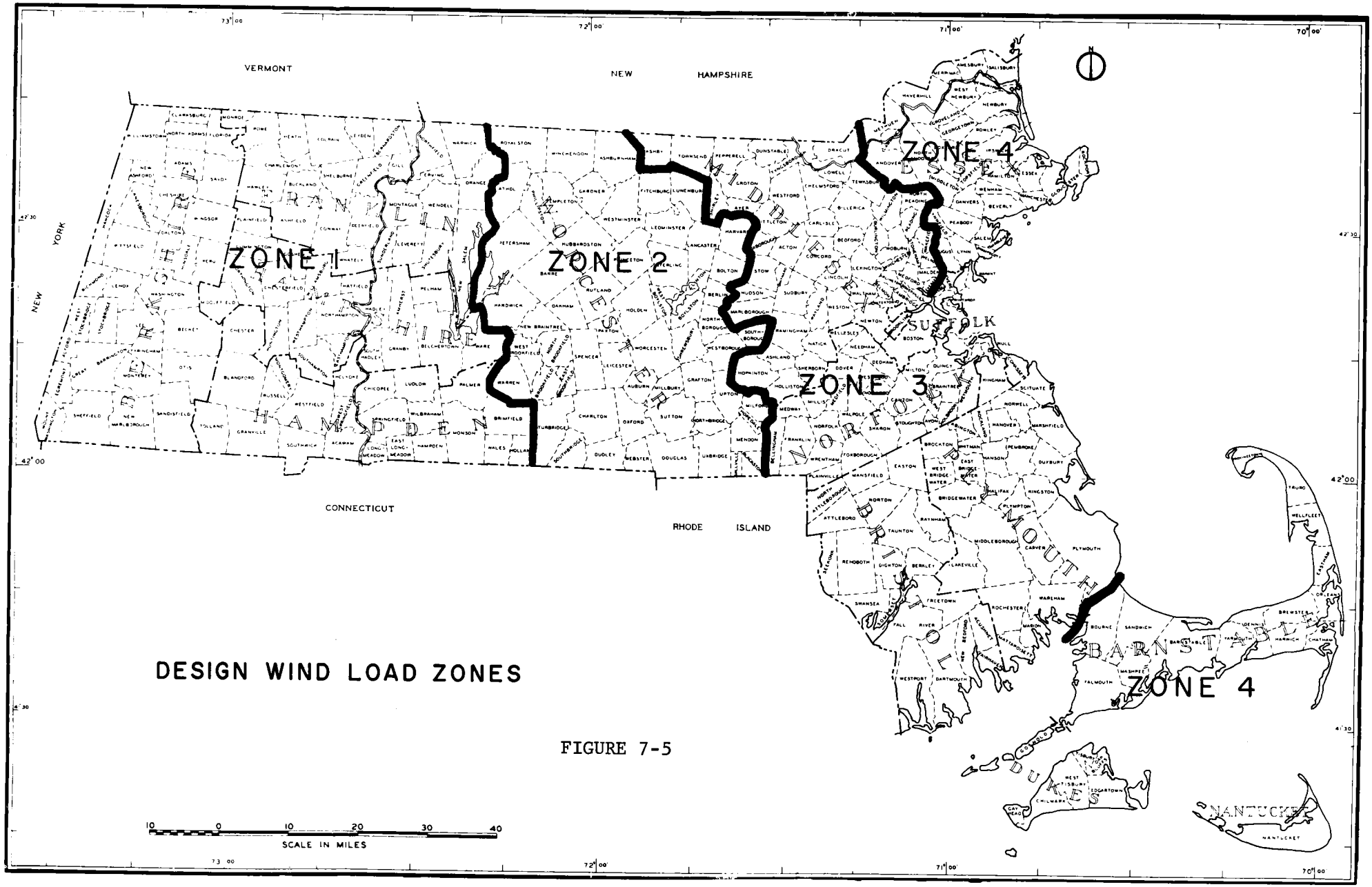
WHEN $h < 5$ ft USE $W = 10$ ft
WHEN $h > 15$ ft USE $W = 30$ ft

h = HEIGHT OF PROJECTION IN ft
g = GROUND SNOW LOAD IN psf
W = WIDTH OF SNOW DRIFT IN ft
ℓ = LENGTH OF PROJECTION IN ft

*For roofs conforming to wind exposure requirements of 712.21 all values of C_s marked with an asterisk (*) may be reduced 25%.

FIGURE 7-4

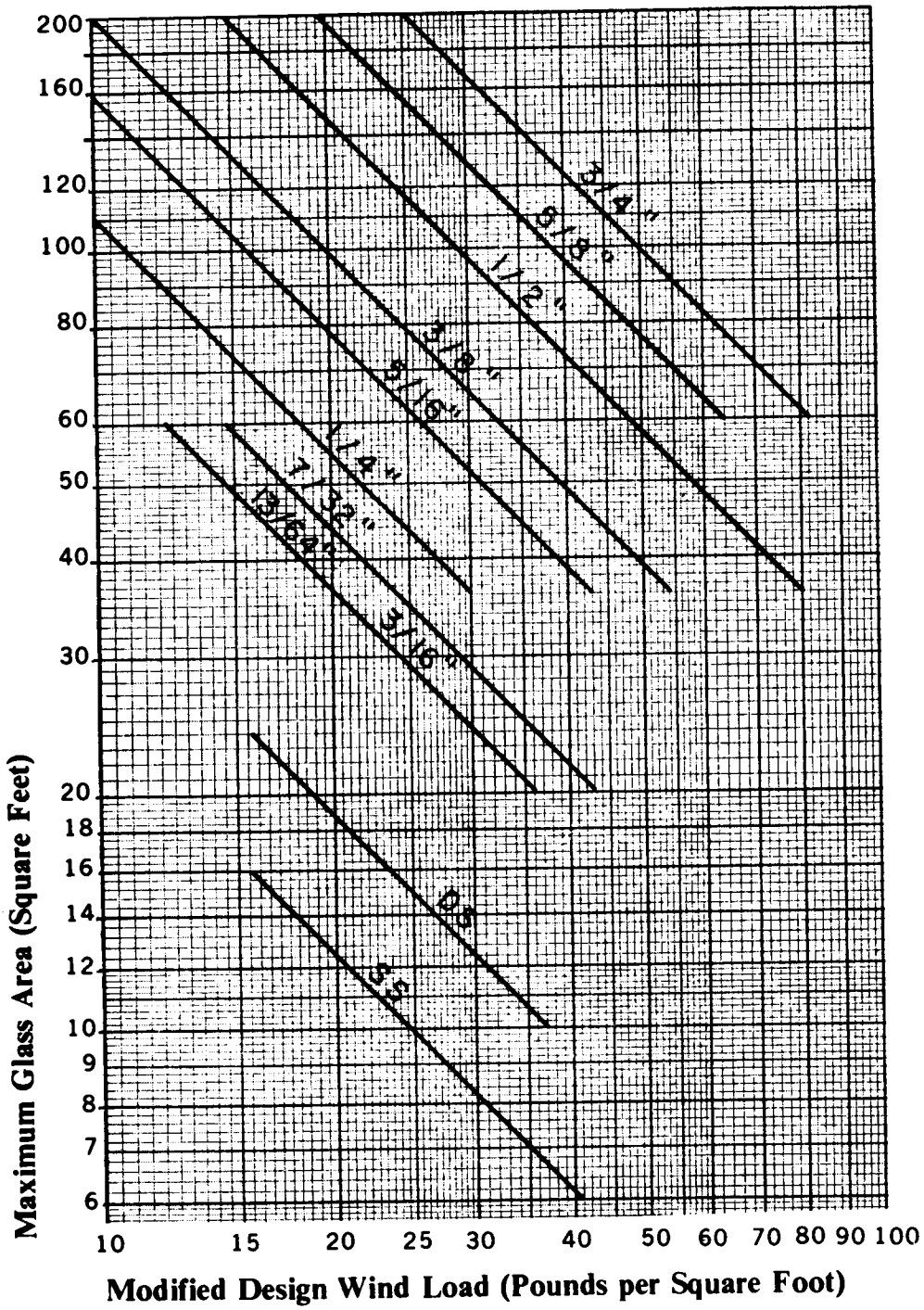
SNOW LOAD DISTRIBUTIONS AND COEFFICIENTS



DESIGN WIND LOAD ZONES

FIGURE 7-5

Required Nominal Thickness of Glass



This chart is based on minimum thicknesses allowed in Federal Specification DD-G-451b

Design Factor - 2.5

FIGURE 7-6