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67th St

Building Ordinance

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CITY OF MIAMI

Approved July 7, 1919

Building Committee
J. W. CLAUSSEN
JOHN T. BLACKMON
FRANK S. DAVIS

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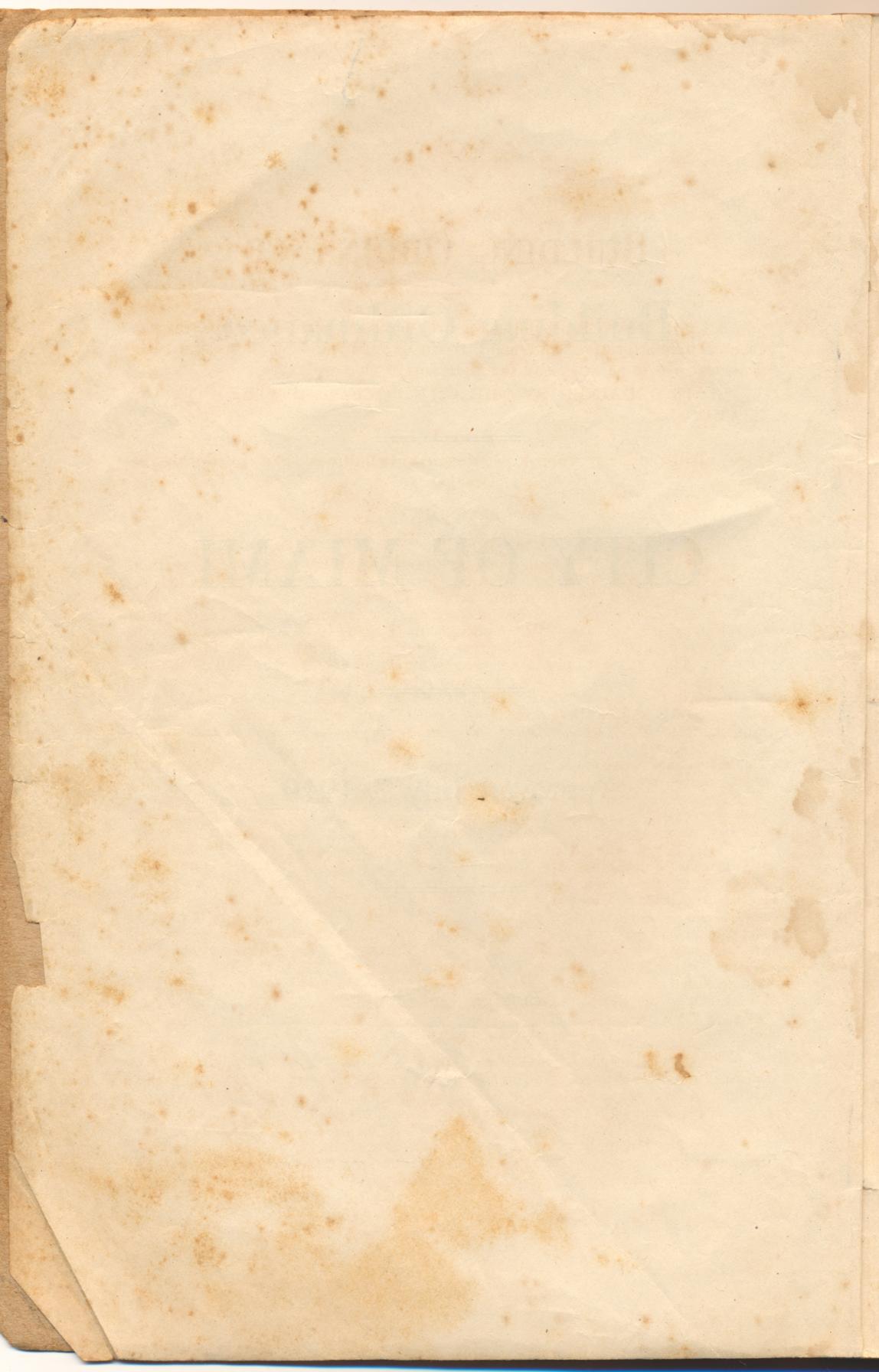
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BUILDING ORDINANCE

AN ORDINANCE providing for fire limits and regulations covering the construction, alteration, equipment, repair or removal of buildings or structures, and providing a penalty for violations of this ordinance.

BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF MIAMI: *Beach, Florida.*

PART I.

Fire Limits, Plans, Approvals, Repairs, Definitions, and Certificate of Occupancy.

SECTION 1

FIRE DISTRICT

That there shall be, and there is hereby established a district, section or portion of the City of Miami, Florida, to be known as the "Fire District" of said City, which said district shall embrace all that portion of said city, described as follows: Starting at the center line at the mouth of the Miami River in said City, run thence north along the harbor line of Biscayne Bay to a point where the south line of First Street produced would intersect the harbor line of said Biscayne Bay; thence due west along the south line of First street to the west line of the right of way of the Florida East Coast Railway Company; thence south along said west line of said right of way to a point opposite the center line of Block 114 North; thence west through the center line of Blocks 114, 113 and 112 North to the east line of Lot 10 of Block 112 North; thence northwesterly along said east line of Lot 10 of Block 112 North to the northerly corner thereof; thence southwesterly along the northerly line of said Lot 10 to a point where said line produced would intersect the center line of the Miami River; thence southeasterly meandering the center line of said Miami River to a point where the northwesterly line of Lot 17 of Block 138 North produced would intersect the center line of said River; thence northeasterly along said north line of Lot 17 to the northeast corner thereof; thence southeasterly along the east line of said Lot 17 to the center line of Block 138 North; thence east through the center line of said Block 138 North and along the South line of Block 137 North to the west line of the Florida East Coast Railway Company's right of way; thence south along the West line of said right of way to the center line of the Miami River; thence easterly meandering the center line of the Miami River to the place of beginning.

BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF MIAMI:

SECTION 2

(1). **Building Construction to Conform to Code.** No wall, structure, building, or part thereof, shall hereafter be built or constructed, nor shall the plumbing, drainage, piping, or wiring of any building, structure or premises, be installed or altered, except in conformity with the provisions of this Code.

(2). No building already erected, or hereafter to be built, shall be raised, altered, moved or built upon in any manner that would be in violation of any of the provisions of this Code, or the approval issued thereunder.

SECTION 3

(1). **Filing Plans and Statements.** Before the erection, construction or alteration of any building or structure or part of same, and before the installation or alteration of the plumbing, drainage, piping or wiring of any building, structure or premises is begun, there shall be submitted to the Building Inspector an application ~~triplicate~~ on appropriate blanks to be furnished by the Building Inspector, containing a detail statement of the specifications including the maximum live load for which each floor is designed when floor construction is involved in the proposed work, and accompanied by a full and complete copy ~~in triplicate~~, of all necessary plans, of such proposed work, and such detail structural drawings thereof as the Building Inspector may require. An affidavit shall also be filed stating the proposed maximum number of persons to be accommodated at one time on each floor above the first story, and the proposed purpose for which each story is intended.

(2). **Application to be Attested.** The application shall contain a sworn statement giving the full name, residence and business address of the owner of the building and of the owner of the premises upon which the building or structure is to be erected, altered or removed, or in which the installation or alteration of plumbing, drainage, piping or wiring is to be made. The application shall describe the location of the building, structure or premises, give the name and address of the responsible party or parties to whom the notice shall be sent for any violation of this Code which may occur during the construction or alteration, the name and address of the architect or other representative duly authorized to perform or have performed said work.

(3). **Application to be Made by Owner or Representative.** The application and statement shall be made by the owner or lessee of the entire building, or by an architect, builder or other duly authorized representative of the owner or lessee.

(4). **Copy to be Kept at Building.** A copy of the aforesaid application ~~and~~ plans, as approved by the Building Inspector shall be kept at the building during the progress of the work and shall be open to inspection by the Building Inspector.

(5). **Statements to be Kept on File.** The said attested statement and detailed application with a copy of the plans shall be kept on file in the office of the Building Inspector.

(6). **False Swearing.** Any false swearing in a material point in any statement submitted in pursuance of the provisions of this section shall be deemed perjury, and shall be punishable as such.

(7). **All Work to be Executed in Accordance With Specifications.** The erection, construction or alteration of said building, structure, or any part thereof, and the installation or alteration of the said plumbing, drainage, piping or wiring, shall not be commenced or proceeded with, except after written approval by the Building Inspector of the applications, plans, and detail drawings, and the issuance of a written permit, and the work shall strictly conform to such applications, plans, detail drawings and permit. In case adequate plans and statements are presented, the Building Inspector may, at his discretion, issue an approval and permit for the construction of a part of a building before the approval of applications and plans of the complete structure.

(8). **Amendments.** Amendments to applications, plans, and detail drawings may be made and the Building Inspector shall approve them provided the applications, plans, and detail drawings, when so amended, shall be in conformity with the provisions of this Code and requirements of the Building Inspector in relation thereto.

(9). **Revocation of Approval.** The Building Inspector shall have power to revoke any approval for any material departure from the approved applications, plans, and detail drawings, or in case any false statements or rep-

resentation as to material fact relating to the erection, alteration or removal of the building has been made.

(10). **Limitation of Six Months.** All approvals of applications, plans and detail drawings and amendments thereto, shall expire by limitation six months from the date of the original approval of the applications, plans and detail drawings, but the limitation shall not apply to the erection of a new building under approved applications, plans, and detail drawings, when work thereunder has been begun and carried on with reasonable continuity within six months from the original approval thereof, when the work to be performed is lawful, and can be carried on without violating any provision of this Code. *specifications*

(11). **Ordinary Repairs.** Ordinary repairs of buildings or structures, or of the plumbing, drainage, or piping thereof, the cost of which shall not exceed \$25.00, may be made without notice to the Building Inspector, but such repairs shall not be construed to include the removal of any stone, concrete or brick wall, or any portion thereof; the removal or cutting of any beams or supports, or the removal, change or closing of any staircase, or opening in the exterior wall; or the alteration or removal of any house sewer, private sewer, or drainage system, or soil, waste or vent pipe; or repairs or alterations of light or power wiring. *w/keep or maintenance*

(12). **Approval or Rejection of Plans.** It shall be the duty of the Building Inspector to approve or reject any plan filed with him pursuant to the provisions of this section within a reasonable time.

SECTION 4

(1). **Demolishing Buildings.** Before the demolition or removal of any building or structure is begun, a verified application shall be prepared by the owner, architect, builder or contractor, on appropriate blanks furnished by the Building Inspector, containing a statement of the facts in relation thereto, and as to the ownership and location thereof. The application shall be filed with the Building Inspector, and a written permit obtained from him. Such permit shall expire by limitation two months from the date of its issue. The Building Inspector shall be given not less than twenty-four hours' notice before the demolition of any building or structure is begun.

(2). In demolishing any building or structure or part thereof, story after story shall be completely removed. No material shall be placed upon a floor of any building in the course of demolition; the bricks, timbers and other parts of each story shall be lowered to the ground immediately upon displacement. The material to be removed shall be properly wet to lay the dust incident to its removal.

(3). When any building or structure over twenty-five feet in height is demolished, a shed covering shall be provided as required by Section 230.

SECTION 5

DEFINITIONS

(1). The following terms when used in this Code shall be construed to have the meaning here given them:

(2). Words used in the present tense include the future as well as the present; the singular number includes the plural and the plural the singular; the word "person" includes a corporation or co-partnership as well as an individual; "writing" includes printing, printed, or typewritten matter.

(3). **Apartment or Tenement House.** An apartment or tenement house is any house or building, or portion thereof, which either rented or leased, to be occupied in whole or in part, as the home or residence of three or more families living independently of each other, and doing their cooking upon the premises; and having a common right in yards, hallways, stairways, etc.; and includes flat houses and all other houses so occupied.

- (4). A yard is an open unoccupied space on the same lot with a house.
- (5). A court is an open unoccupied space, other than a yard, on the same lot with a building. A court not extending to the street or yard is an inner court. A court extending to the street or yard is an outer court. If it extends to the yard it is a yard court. *ad H Sec 7 Davis*
- (6). **Approved.** The term "approved" refers to a device, material, or construction which has been approved by the Underwriter's Laboratories; or such approval may be granted by the Building Inspector as a result of tests or investigation made under his direction; or he may issue approval upon satisfactory evidence of competent and impartial tests or investigations conducted by others, provided the Building Inspector's approval of any materials used in the construction of building shall not in any manner conflict with the approval of the Underwriters' Laboratories.
- (7). **Approved Fire-Resistive Roofing.** Roofing which shall at least meet the requirements of the test specified in Section 162.
- (8). **Areaway.** An open, sub-surface space adjacent to a building for lighting or ventilating cellars or basements.
- (9). **Area of a Building.** The area of the horizontal cross-section at the ground level measured to the center of party walls or fire walls, and to the outside of other walls.
- (10). **Basement.** A story partly but not more than one-half below the level of the curb.
- (11). **Bearing Wall.** A wall which supports any load other than its own weight.
- (12). **Bullhead or Pent House.** A structure erected on the roof of a building for the purpose of enclosing stairways to the roof, elevator machinery, water tanks, ventilating apparatus, exhaust chambers or other building equipment machinery and for janitor's quarters. When used only for the above mentioned purposes, such structures need not be considered in determining the height of the building.
- (13). **Cellar.** A story whose height is more than one-half below the level of the curb. It shall not be counted as a story in determining the height of a building.
- (14). **Cement Mortar.** Cement mortar shall be made of cement and sand in the proportions of one part of cement and not more than three parts of sand by volume.
- (15). Except in chimneys, not more than 15 per cent. of the cement by volume may be replaced by an equal volume of dry hydrated lime. The lime and cement shall be thoroughly mixed before the addition of water. The mortar shall be used immediately after water is added.
- (16). Cement-lime mortar shall be made of one part of cement, one part of slaked lime or dry hydrated lime, and not more than three parts of sand to each. All materials to be measured.
- (17). **Cement Plaster.** A plaster composed of one part Portland cement, not more than three parts sand, and not more than 10 per cent. by volume of hydrated lime, with hair or other binder when necessary.
- (18). **Cement-tempered Plaster.** A lime or gypsum plaster tempered with not less than 20 per cent. of Portland cement.
- (19). **Court.** See Tenement House Law, Section 234.
- (20). **Curb.** Wherever the word "curb" refers to the height of a building or to the definition of a basement or cellar, it shall be construed to mean the curb level or established grade at the center of the principal front of the building fronting on one street only; in the case of a building fronting on more than two streets, the curb level at the center of the front facing on the highest curb shall be taken, unless the highest curb is more than 10 ft. higher than the lowest curb, in which case the average level of the two curbs shall be taken. Whenever the word "curb" refers to an excavation, the level of the curb shall be taken at the intersection of the lot lines and

the curb lines. In the case of a building fronting on two or more streets, the curb levels shall be taken on each street at the intersection of the lot lines and the curb lines, and their relation to and adjoining building or buildings be as though two or more excavations were to be made.

(21). **Curtain Wall.** Any exterior non-bearing wall between columns or piers, which is not supported by beams or girders at each story. See Section 25.

(22). **Dead Load.** The weight of the walls, framing, floors, roofs, tanks with their contents, and all permanent construction.

(23). **Division Wall.** Any interior wall in a building.

(24). **Dwelling.** A residence building, designed for, or used as the home or residence of not more than two separate and distinct families.

(25). **Enclosure Wall.** See Panel Wall.

(26). **Existing Building.** A completed building or structure, or one for which plans have been filed previous to the date on which this Code goes into effect.

(27). **Exterior Wall.** Any outside wall, or vertical enclosure of a building, other than a party wall.

(28). **Factory.** A building or portion thereof, designed or used to manufacture or assemble goods, wares, or merchandise, the work being performed wholly, or principally by machinery.

(29). **Fibre Plaster Board.** A board consisting of any intimate mixture of gypsum plaster composition and a fibrous binding material.

(30). **Fire Door.** A door, frame and sill which will successfully resist a fire for one hour in accordance with test specifications given in Section 162, and has been approved upon such test. For self-closing and automatic fire doors, see Section 26.

(31). **Fire Exit Partition.** A sub-dividing partition built for the purpose of protecting life by providing an area of refuge. See Section 43.

(32). **Fireproof.** As used in this Code, except as elsewhere prescribed by tests for particular types of construction, refers to materials or construction not combustible in the temperatures of ordinary fires, and which will withstand such fires without serious impairment of their usefulness for at least one hour.

(33). **Fireproof Construction.** See Section 99.

(34). **Fire Shutter.** A shutter which will successfully resist a fire for one hour in accordance with test specifications given in Section 162, and has been approved upon such test.

(35). **Fire Wall.** A wall built for the purpose of restricting the area subject to the spread of fire. See Section 26.

(36). **Fire Window.** A window frame, sash, and glazing which will successfully resist a fire for one hour in accordance with test specifications given in Section 162, and has been approved upon such test. No single pane in a fire window shall exceed 720 square inches.

(37). **Foundation Wall.** Any wall or pier built below the curb level or nearest tier of beams to that level.

(38). **Garage.** A garage is (a), that portion of a structure in which a motor vehicle containing volatile inflammable oil in its fuel storage tank is stored, housed or kept; (b), all that portion of such structure that is on, above, or below the space mentioned in (a), which is not separated therefrom by tight, unpierced fire-walls and fire-proof floors.

(39). **Gypsum Block.** The term "gypsum block" shall include tile or blocks composed of gypsum and not exceed 5 per cent. by weight of combustible fibre binding material; or a mixture of crushed cinders and gypsum, commonly called "cinder-plaster blocks."

(40). **Gypsum Mortar or Plaster.** See Section 49.

(41). **Height of a Building.** The vertical distance from the curb level to the top of the highest point of the roof beams in the case of flat roofs, or

to the average height of the gable in the case of roofs, having a pitch of more than 20 degrees with a horizontal plane. When a building faces two or more streets having different grades, the measurement shall be taken at the middle of a facade on the street having the greatest grade. When a building does not adjoin the street, the measurement shall be taken from the average level of the ground adjoining such building. In measuring the height of a wall, the height of the parapet above the top of the roof beams shall not be included.

(42). **Horizontal Exit.** See Section 42.

(43). **Hotel.** Any building or portion thereof, designed or used for supplying food or shelter to residents or guests, and containing more than fifteen sleeping rooms above the first story.

(44). **Incombustible.** Materials or construction which will not ignite or burn when subjected to fire.

(45). **Live Load.** All loads other than dead loads. All partitions which are subject to removal or rearrangement shall be considered as live load.

(46). **Mill Construction.** See Section 92.

(47). **Non-bearing Wall.** One which supports no load other than its own weight.

(48). **Non-fireproof Construction.** See Section 88.

(49). **Occupied.** Shall be construed to mean occupied, to be occupied, or intended or designed to be occupied.

(50). **Office Building.** One used for professional or clerical purposes, but not for manufacturing, storage, or sale of goods except by sample; also excepting the first story which may be used for commercial purposes. No part of such building shall be used for living purposes except by the janitor's family.

(51). **Ordinary Construction.** See Section 66.

(52). **Outhouses.** All structures not exceeding 8 ft. in height, nor more than 150 square feet in area, exclusive of sheds.

(53). **Owner.** Any person, firm or corporation owning or controlling property, and includes a duly authorized agent or attorney. Guardians, conservators or trustees shall also be regarded as owner.

(54). **Panel or Enclosure Wall.** An exterior non-bearing wall in a skeleton structure built between columns or piers and supported at each story. See Section 24, par. 14.

(55). **Parapet Wall.** That portion of any wall which extends above the roof line and bears no load except as it may serve to support a tank. See Section 27.

(56). **Party Wall.** A wall used or adapted for joint service between two buildings.

(57). **Public Building.** See Section 8.

(58). **Public Hallway.** A hall, corridor or passageway used in common by the occupants of a building and serving as a means of communication for the public between an entrance to any store of a building, and the various rooms, apartments or spaces in that story.

(59). **Retaining Wall.** One constructed to support a body of earth or to resist lateral thrust.

(60). **Shed.** A roofed structure, open on one or more sides, which does not exceed 15 feet in height nor more than 500 square feet in area.

(61). **Skeleton Construction.** A form of building construction wherein all external and internal loads and stresses are transmitted to the foundations by a rigidly connected framework of metal or reinforced concrete. The enclosing walls are supported by girders at each story.

(62). **Skylight.** Any cover or enclosure placed above roof openings for the admission of light.

(63). **Slow-burning Construction.** See Section 92.

(64). **Smokeproof Tower.** See Section 41.

(65). **Story.** That part of any building comprised between any floor and the floor or roof next above. In case any floor or the combined area of floors at any one level extends over less than 20 per cent. of the horizontal area included within the outside walls at that level, the same shall not be considered as a floor for the purpose of determining story heights.

(66). **Structure.** Includes the terms building, appurtenance, wall, platform, staging or flooring used for standing or seating purposes; a shed, fence, sign or billboard on public or private property, or on, above or below a public highway.

(67). **Building Inspector.** The Building Inspector or such other official title as a city charter may apply to that office or position, which has assigned to it such duties as are generally recognized in supervising building construction. It shall also include any deputy or assistant authorized to represent such public official.

(68). **Theatre.** Any building or part of a building designed or used for theatrical or operatic purposes with accommodation for an audience of more than three hundred persons, and having a permanent stage upon which movable scenery and theatrical appliances are employed; including also moving picture theatres, either with or without a stage and having capacity as above stated. See also Section 183.

(69). **Warehouse.** A building or portion thereof, designed or used for the storage of goods, wares and merchandise.

(70). **Width of a Building.** The horizontal dimension next in value to the length.

(71). **Wired Glass.** Glass not less than $\frac{1}{4}$ inch thick enclosing a layer of wire fabric reinforcement having a mesh not larger than $\frac{7}{8}$ inch, and the size of wire not smaller than No. 24 B. and S. Gauge.

(72). **Workshop.** A building or room in which articles of merchandise are manufactured or repaired wholly or principally by hand.

(73). **Yard.** See Tenement House Law, Section 237.

SECTION 6

(1). **Certificate of Occupancy.** Upon completion of such building, structure or alteration, provided no violations of this Code exist, the Building Inspector shall issue to the owner a Certificate of Occupancy of the proposed building or part thereof, stating the purposes for which the building or structure may be used; also the maximum live load, and maximum number of persons that may be accommodated on each floor thereof.

(2). The Building Inspector shall upon application issue a temporary certificate of occupancy allowing the use of a portion of any building, providing no violation of the Code exists against that portion, and provided such temporary use of said portion would not endanger life or property.

(3). No building, structure or part thereof shall be altered or converted in a manner to affect its occupancy, or used for any purposes whatsoever until the issuance of a certificate of occupancy; nor shall any building, structure or part thereof be occupied or used for any other purpose, or in any manner other than that prescribed in said certificate of occupancy; nor shall any building or structure or part thereof be burdened by any greater load, or be occupied by a greater number of persons than designated in said certificate.

Certificate of occupancy for an existing building as a result of a survey, Section 228.

(4). The owner of every building of Classes B, E and F shall post in a conspicuous place in each story, one or more signs giving maximum number of persons, purposes of use, and maximum live load for which certificate has been issued for that particular story.

SECTION 7

(1). **Change of Occupancy.** No change in the manner of occupancy shall be made in any story of any building or structure, or portion thereof, tending to increase the floor loads or the number of persons to be accommodated therein until there shall have been issued by the Building Inspector a Certificate of Occupancy covering such new use or manner of occupancy; nor shall the manner of occupancy nor the purpose for which any building or structure or portion thereof is used be changed, except in conformity with the requirements of this Code, as to exits and floor loads.

(2). The Building Inspector shall cause any building or story therein to be vacated whose occupancy has been changed, or floor loads increased in violation of Section 36, and it shall not again be occupied until made to conform with the requirements of this Code.

PART II.

CLASSIFICATION OF BUILDINGS

Section 8. Classification of Buildings by Construction.

(1). For the purposes of this Code buildings shall be classified according to the method of construction as follows:

Frame Construction.

Non-Fireproof Construction.

a. Ordinary Construction.

b. Mill Construction.

Fireproof Construction.

(2). **Frame Construction.** A building having the exterior walls or portions thereof of wood; also a building with wooden framework veneered with brick, stone, terra cotta, or concrete; or covered with plaster, stucco, or sheet metal, shall be classed as a frame building.

Frame Buildings, See Sec. 175.

(3). **Non-Fireproof Construction.** The term "Non-Fireproof Construction" shall apply to all buildings or structures having exterior masonry walls with floors and other interior construction wholly or in part of wood.

(a) **Ordinary Construction.** A building having masonry walls, with floors and partitions of wooden joist and stud construction. The supporting posts and girders may be of wood, or of metal protected as required in Section 65. *interior*

(b) **Mill Construction.** (Sometimes called "Slow-burning Construction.") A building having masonry walls, and heavy timber interior construction. See Section 92.

(4). **Fireproof Construction.** Buildings of masonry, steel, or reinforced concrete construction in accordance with Sections 99 to 105 shall be considered fireproof.

amended Section 9—Classification of Buildings by Occupancy.

(1). All buildings shall be classified according to their occupancy or use under one of the three following groups: Public Buildings, Residence Buildings, and Business Buildings. These groups shall be further subdivided into six classes, two in each group, designated as A, B, C, D, E and F, as follows:

Public Buildings:

Class A,

Class B,

Class C,

Residence Buildings:

Class E
Class D.

Business Buildings:

Class E.
Class F.

(2). **Public Buildings. When Required Fireproof.** Public Buildings shall be construed to include all buildings or structures accessible to the public, and in which people may congregate for civic, political, educational, religious, amusement or transportation purposes; or in which they may be voluntarily or forcibly detained or housed for safety, punishment, observation, or care.

Class A. Armories, Asylums, Bath Houses (with sleeping accommodations other than those required for janitor), City Halls, Colleges, Court Houses, Detention Buildings, Police Stations, Hospitals, Libraries, Museums, Nurseries, Railway Passenger Stations, Schools, and Theatres.

Buildings of this class shall be of fireproof construction, except that schools in which no pupils are accommodated above the second story may be of non-fireproof construction.

Where armories, railway passenger stations, museums and similar buildings have large arched exposed roof construction, the fireproofing of the structural members of these roofs may be omitted if, in the opinion of the Building Inspector, the construction of the remainder of the building would reasonably warrant such omission.

Class B. Amusement Halls, Churches, Exhibition Buildings, Lodge Rooms, and Public Halls.

All buildings of this class shall have the floor over cellar or basement which is nearest to grade level of fireproof construction.

Buildings of this class over three stories, or 40 feet high, shall be of fireproof construction throughout, except that church spires need not be fireproof until they exceed 75 feet in height.

Every permanent structure intended for the seating or accommodation of the public, commonly known as grand-stands, erected within the fire limits, shall be of fireproof construction, except that the seats may be of wood, and the structural steel work may be unprotected. When portions of such structures are enclosed, the enclosing construction shall be fireproof.

(3). **Residence Buildings. When Required Fireproof.** Residence Buildings shall be construed to mean and include all buildings in which sleeping accommodations (other than for janitor or watchman) are provided.

Class C. Bachelor Apartments, Club Houses, and Studios with more than 15 sleeping rooms, Dormitories, Hotels and Lodging Houses.

Buildings of this class when permitted of frame construction shall not exceed two stories or 30 feet in height.

All buildings of this class three stories in height shall have the floor over cellar or basement which is nearest to grade level of fireproof construction.

Buildings of this class over three stories, or 40 feet high, shall be fireproof construction throughout.

Class D. Dwellings, Tenement Houses, and all other residence Buildings not specified in Class C.

Buildings of this class over three stories, or 40 feet high, shall have the floor over cellar or basement which is nearest grade level of fireproof construction.

Buildings of this class over four stories, or 55 feet high, shall be of fireproof construction throughout.

When the lower stories or portions thereof in non-fireproof buildings of Classes C and D are occupied for business purposes, the construction shall be made in accordance with the requirements of Section 88.

Cellar ceilings when first floor is not fireproof, Sec. 178.

(4). **Business Buildings. When Required Fireproof.** Business Buildings shall be construed to mean and include all structures used for or adapted to the transaction of business, the operation of machinery, the manufacture or storage of machinery or materials, the housing of live stock, or for any other industrial purpose.

Class E. Factories, Lofts, Office Buildings, Printing Houses, Restaurants, Stables, Stores, Warehouses, and Workshops.

Buildings of this class of ordinary construction over two stories, or 30 feet high, shall have the floor over the lowest story of fireproof construction; buildings of this class over four stories, or 55 feet high, shall be of fireproof construction throughout, or of mill construction. Mill construction buildings shall not exceed 65 feet in height.

Class F. Car Barns, Foundries, Light and Power Plants, Railroad Freight Stations, Ice Houses; also Special Industry Buildings, constructed and occupied exclusively for a special purpose or industry and not otherwise classified, such as Coffee Roasters, Dry Cleaning Establishments, Grain Elevators, Ice-Making Plants, Laboratories, Malt Houses, Oil Houses, Oil Refineries, Refrigerating Plants, Rendering Plants, Soap Factories, Sugar Refineries, Smoke Houses, Slaughter Houses, Wharf Buildings, also Garages accommodating more than three cars, or in which cars are stored on more than one floor.

Buildings of this class, such as garages (as herein defined), oil houses, oil refineries, rendering plants, smoke houses, varnish works, etc., and buildings or portions of buildings which are used for the storage or handling of large quantities of combustible packing or refuse material, shall be only of fireproof construction. All other buildings of Class F shall be of fireproof or mill construction if within the fire limits or if they exceed 55 feet in height.

Buildings of Class F, whether of fireproof construction and within the fire limits, or of non-fireproof construction, and outside the fire limits, shall only be erected in such isolated localities and under such conditions as are approved by the Superintendent of Building Construction.

Buildings of Class F, frame construction, Section 175.

Storage of lumber shall not be permitted within fire limits unless the stock is stored in sheds or buildings with incombustible walls and approved roofs.

(5). Unless special exception is made, every provision of this Code applying to any building of a class shall apply to all buildings of that class.

(6). When any building is not classified, or where there is any doubt as to its classification, the Building Inspector shall designate under which class it shall be placed.

(7). When any building is used for the purpose of two or more classes as herein defined, that portion devoted to the occupancy or use of a particular class shall be constructed in accordance with the requirements of that class, unless such construction shall in the opinion of the Building Inspector prove impracticable, or where there shall be a conflict between the require-

ments of the different classes, in which case the class requiring the safest form of construction shall govern the entire building.

A public record of all classifications of buildings made by the Building Inspector shall be kept on file in the office of the Building Inspector, in accordance with the provisions of Section 8.

PART III.

PERMISSIBLE AREA OF LOT OCCUPIED.

Section 10.—Limits of Lot Area Occupied.

(1). Except as hereinafter provided, all buildings shall have uncovered spaces for providing light and air. These spaces shall be open to the sky from the top of the second story window sills and shall be in accordance with the following table; in which all paragraphs from 2 to 11 inclusive shall be read as if containing the words "except theatres, special industry buildings, and tenement houses."

(2). Buildings of Class C, on lots other than corner lots: 20 per cent. of total lot area when not exceeding 75 feet in height.

25 per cent. of total lot area when over 75 feet and not exceeding 125 feet in height.

Buildings of Class C, on corner lots:

15 per cent. of total area when not exceeding six stories or 75 feet in height, and shall increase 2 per cent. for each additional story up to 125 feet in height.

(3). All buildings not enumerated in paragraph 2 on lots other than corner lots:

10 per cent. of total lot area when not exceeding 75 feet in height.

12½ per cent. of total lot area when over 75 feet and not exceeding 125 feet in height.

(4). All buildings not enumerated in paragraph 2 on corner lots not exceeding 2500 square feet in area:

5 per cent. of total lot area when not exceeding 75 feet in height.

7½ per cent. of total lot area when over 75 feet and not exceeding 125 feet in height.

(5). When buildings are on corner lots, more than 2500 square feet in area, that portion of the building upon the excess lot area over and above 2500 square feet shall be provided with open spaces in accordance with the requirements of paragraph 2, or 3, as the case may be of this section.

(6). Every building (other than buildings of Class C) which occupies lots fronting upon three or more streets may occupy the entire lot area, provided the maximum width of the building does not exceed 75 feet.

(7). The total area of the uncovered spaces of all buildings which are more than 75 feet in width and occupy an entire block front facing upon three or more streets may be less by 25 per cent. than is required by the provisions of paragraphs of this section.

(8). There shall be a clear space not less than 5 feet in width, at and above the second story window sills, between the rear line of every building and the rear line of every lot except corner lots. This shall not apply to buildings which extend through from one street to another.

(9). In every court yard the distance between opposite boundary walls shall be not less than 5 feet at any point for a height not exceeding 75 feet, and shall be at least ½ inch greater throughout its height for every additional foot above 75 feet.

(10). When existing buildings are extended or increased in area, the ratio of total uncovered space to the area of the lot shall not be required to be greater than it would be were the entire building erected in accordance with this Code.

allows 40 x 127

(11). In order to fulfill the requirements of this section, uncovered spaces may be increased in size as they go upward if thereby they provide at every given level the requisite area of uncovered space for a structure of that particular height.

Light and ventilation, Sec. 85.

PART IV.

EXCAVATIONS AND FOUNDATIONS

Section 11 —Excavations.

(1). The person causing any excavation to be made for a building, shall have the same properly guarded and protected. Wherever necessary he shall at his own expense properly sheath pile and erect masonry or steel construction, or a sufficient retaining wall to permanently support the adjoining earth. Such retaining wall shall extend from full depth of excavation to the level of the adjoining earth and shall be properly coped.

Section 12—Excavations Affecting Adjoining Property.

(1). Whenever an excavation is not intended to be or shall not be carried to a depth of more than 10 feet below the curb level, the owner of every adjoining or contiguous wall or structure, yard, or bank of earth or rock shall protect the same, so that they shall be and remain as safe as before such excavation was begun. Such owner shall be permitted to enter upon the premises where the excavation is being made when necessary for this purpose.

(2). Whenever an excavation of either earth or rock for buildings or other purposes shall be intended to be or shall be carried to the depth of more than 10 feet below the curb, the person causing such excavation to be made shall at all times from the commencement until the completion thereof, if accorded the necessary license to enter upon the adjoining land, and not otherwise, at his own expense preserve any adjoining or contiguous wall, structure, yard, or bank of earth or rock from injury, and support the same by proper foundations or retaining walls, so that the said wall, structure, yard, or bank of earth or rock shall be and remain practically as safe as before such excavation was commenced, whether the said adjoining or contiguous wall, structure, yard, or bank of earth or rock are down more or less than 10 feet below or above the curb. For this purpose such approved foundations or retaining walls may be built upon the property upon which the wall, structure, yard, or bank of earth or rock is situated. If the necessary license is not accorded to the person or persons making such excavation, then it shall be the duty of the owner refusing to grant such license at his own expense to make the adjoining or contiguous wall, structure, yard, or bank of earth or rock safe, and support the same by proper foundations so that adjoining excavations may be made, and shall be permitted to enter upon the premises where such excavation is being made for that purpose, when necessary.

Section 13—Foundations Adjoining Party Walls.

(1). In case a party wall is intended to be used by the person causing an excavation to be made, and the footings and foundations of such party wall are in good condition and sufficient for the uses of both the existing building and the new one, then the person causing the excavation to be made shall, at his own expense, preserve such party wall from injury and support the same by proper means, so that said party wall shall be and remain as safe as before the excavation was begun.

(2). In case the footings and foundations of any said party wall are not in good condition, or not sufficient for the uses of both the existing building and the new one, it shall be the duty of the person causing such

excavation to be made to extend such defective or insufficient footing or foundation, or to replace same with a new footing or foundation. Such extended or new footing shall project on each side of the party line such a distance as to bring the center of the footing under the center of the wall, so that the total load upon the wall may be uniformly distributed over the area of the footing. Any other method may be used which will adequately support the party wall. In order that this may be done, the person causing the excavation to be made shall be allowed access to the adjoining premises.

(3). In case any excavation or the removal of any existing building, shows any adjoining wall or structure to be unsafe at the time the excavation was begun, it shall be the duty of the person causing the excavation to be made, or the building to be removed, to forthwith report the fact, in writing, to the Building Inspector, who shall upon the receipt of such notice forthwith cause an inspection of such adjoining premises to be made, and if such inspection proves the aforesaid wall or structure to be unsafe, it shall be the duty of the Building Inspector to declare such wall or structure to be unsafe and cause the same to be repaired as herein provided.

(4). If the person whose duty it shall be to preserve or protect from injury any wall or structure shall neglect or fail so to do within 24 hours after the receipt of a notice from the Building Inspector, then the Building Inspector may enter upon the premises and employ such labor, and furnish such materials and take such steps as, in his judgment, may be necessary to make the premises safe and secure, or to prevent the same from becoming unsafe or dangerous, at the cost and expense of the person whose duty it is to keep the same safe and secure.

Section 14—Bearing Capacity of Soil

(1). When doubt arises as to the safe sustaining power of the soil upon which a building is to be erected, the Building Inspector may order borings to be made, or he may order tests of the sustaining power of the soil to be made by and at the expense of the owner of the proposed building. Such test shall be made in accordance with specifications established by the Building Inspector, and he shall be notified before any test is made, so that he may be present or represented thereat. The records of such borings or tests shall be filed in the ~~Bureau of Buildings~~ *Office of the Building Inspector.*

(2). The safe bearing capacity of different soils shall be as determined by the Building Inspector, and in the absence of tests shall not exceed the values given with the following tables:

Soft clay	1
Firm clay, fine sand, or layers of sand and clay, wet	2
Clay or fine sand, firm and dry	3
Hard clay, coarse sand, gravel	4
Hard pan	8 to 15
Rock	15 to 72

see MB Code.

Section 15—Foundation Walls

(1). Foundation walls shall be construed to include all walls and piers built below the curb level, or nearest tier of beams to the curb, or to the average level of the ground adjoining the walls, to serve as supports for walls, piers, columns, girders, posts or beams.

(2). If built of rubble stone, they shall be at least 8 inches thicker than the wall next above them to a depth of 12 feet below the curb level; and for every additional 10 feet, or part thereof deeper, they shall be increased 4 inches in thickness.

(3). If built of brick or plain concrete and supporting walls over 30 feet in height, they shall be at least 4 inches thicker than the wall next above them to a depth of 12 feet below the curb level; and for every additional 10 feet, or part thereof deeper, they shall be increased 4 inches in

see schedule

thickness. In buildings not exceeding 30 feet in height, the Building Inspector may at his discretion permit the foundation walls to be the same thickness as the walls above.

(4). Hollow blocks may be used for the foundation walls of buildings not exceeding three stories or 40 feet in height, provided said walls are not less than the thickness required for foundation walls of brick or plain concrete. All blocks shall be laid to line and level, and carefully bonded. When blocks are laid with cells vertical the stability of the walls and their resistance to water, may be increased by being filled solidly with wet concrete. Such foundations shall not be stressed beyond the limits allowed in Section 58, taken over combined area of blocks and fill.

(5). Portland cement mortar only, shall be used in footings and foundation walls.

Reinforced concrete walls, Sec. 136.

Section 16—Footings

(1). The footings for foundation walls, piers, and columns, shall be constructed of plain concrete, reinforced concrete, or of steel grillage beams, resting on a bed of concrete. ~~Wooden footings may be used if they are entirely below the level of low water.~~

(2). Footings shall be so designated that the loads they sustain per unit of area shall be as nearly uniform as possible, and the stresses shall conform to the requirements of this Code. The dead loads carried by the footings shall include the actual weight of the superstructure and foundations down to the bottom of the footing. All tanks or other receptacles for liquids shall be figured as being full. All vaults or similar built-in structures shall be considered parts of the building.

The live load on column footings shall be assumed to be the same as the live load in the lowest tier of columns.

(3). Loads exerting pressure under the footings of foundations of buildings more than three stories in height, shall be computed as follows:

(a) For buildings in which the required live load does not exceed 75 pounds per square foot, assume the total dead load, plus 60 per cent of the full live load.

(b) For buildings in which the required live load exceeds 75 pounds per square foot, assume the total dead load, plus 75 per cent. of the full live load.

(3) In no case shall the load per square foot under any portion of any footing due to the combined dead, live, and wind loads, exceed the safe sustaining power of the soil upon which the footing rests.

(4). Concrete footings shall be not less than 12 inches thick, except as provided in Section 136.

Concrete for footings shall be made of at least one part of Portland cement, and not more than two and one-half parts of sand, and five parts of broken stone or gravel.

Quality of concrete, Sec. 109.

(5). Broken stone shall be hard, durable, and of quality approved by the Building Inspector. Where gravel is used it shall be thoroughly washed.

(6). Where mass concrete is used for footings or foundations, the stone or gravel shall be of such size as will pass through a two-inch ring, and shall be free from dust or other deleterious material. Sufficient smaller aggregate shall be added to secure density.

(7). Stepped up courses of brick shall have offsets of not more than ½ inch if laid in single courses, and 1 inch if laid in double courses.

(8). If the nature of the ground and the character of the building are such as to make it necessary or advisable, isolated piers may be used instead of a continuous wall to support the building.

(9). Grillage beams shall be united by bolts and separators, and the grillage filled solid with concrete. All metal which forms parts of any footing or foundation shall be protected from rust by a wash of rich Portland cement grout, or by the use of other approved coating, and shall be entirely encased with at least 4 inches of concrete.

Mortar for footings, Sec. 25.

Section 17—Wooden Piles

(1). Wooden piles shall be of approved timber. They shall be sound and straight. The diameter at the butt shall be not less than 10 inches, and the diameter at the point shall be not less than 6 inches. Any pile over 20 feet in length shall be not less than 12 inches at the butt. The minimum distance between piles shall be 2 feet.

(2). Piles shall be driven to refusal if possible, and the method of driving shall be such as not to impair their strength. The maximum load carried by a pile driven through firm soil to rock or hard pan shall be computed by multiplying the average area of cross section in inches by 500 lbs.; but in no case shall such load exceed 12 tons. Piles driven through loose wet soil to solid rock or hard pan, shall be figured as columns unsupported laterally for their entire length.

(3). The safe sustaining power of a pile not driven to refusal, which shall in no case exceed 15 tons, shall be determined by calculation based upon the following formula:

$$L = \frac{2WH}{P + 1}$$

in which L = the allowable load in tons (maximum ten tons).

W = the weight of the hammer in tons.

H = the fall of the hammer in feet (maximum 15 ft.)

P = the average penetration in inches under the last five blows after the pile has been sunk to a point where successive blows produce approximately equal penetrations.

The Building Inspector shall be notified before any test is made of the sustaining power of piles, so that he may be present or represented thereat.

(4). The sustaining power of wooden piles driven by steam or pneumatic hammers or by jetting shall be determined by test as directed by the Building Inspector.

(5). Piles shall be cut off so that the tops are always below the level of mean low water. Portland cement concrete shall be rammed down in the interspaces between the heads of the piles to a depth of not less than eight inches, and laterally for a distance of not less than 12 inches on each side of the rows of piles.

(6). Under frame buildings piles may be capped with timbers; the timbers shall be sound wood, not less than 6 inches thick and properly joined together. The tops of all such timbers shall be below the level of mean low water, except in the case of frame buildings built over the water or on soft meadow, or similar land, in which case piles may project above the water a sufficient distance to raise the building above high tide, and then the building may be placed directly thereon.

Section 18—Concrete Piles

(1). Piles consisting of steel tubes filled with concrete shall have a minimum inside diameter of 10 inches and the thickness of the metal tube not less than 3/8 inch. The length shall not exceed forty times the inside diameter. The ends of the tube shall be faced perpendicular to its axis. No more than one splice of an approved design shall be used in the total length of the pile. When driven to rock the load on such piles shall not exceed 500

lbs. per square inch on the concrete and 7500 lbs. per square inch on the steel. In computing the effective area of the steel, 1/8 inch of its thickness shall be deducted from the thickness of the tube to allow for corrosion.

(2). Concrete piles moulded and cured before driving shall be provided with not less than 2 per cent. nor more than 4 per cent. of longitudinal reinforcement with bands or hoops not less than 3/8 inch diameter, and spaced not further apart than 6 inches. The average diameter of the pile shall be not less than 12 inches, and the diameter at the foot not less than 8 inches. The length shall not exceed thirty times the average diameter for piles driven through firm soil, and shall not exceed fifteen times the average diameter for piles driven to rock through loose wet soil, or filled ground. When driven to rock the maximum load carried on such piles shall not exceed 6000 lbs. per square inch on the longitudinal reinforcement and 500 lbs. per square inch on the concrete at the average cross section.

The top of the piles shall be protected with a cushion cap of approved design, and when driven to rock the foot shall be provided with a metal shoe having a square bearing.

(3). When piles of the types described in paragraphs 1 and 2 are not driven to rock their carrying capacity shall be determined by means of one or more test piles, and the working load shall not exceed one-half the test load under which the pile begins to settle, nor shall the prescribed unit stresses be exceeded.

(4). Concrete piles cast in place shall be made in such manner as to insure the exclusion of any foreign matter, and to secure a uniform full-sized section for the entire length. The average diameter of the pile shall be not less than 14 inches and the diameter at the foot not less than 8 inches. The length shall not exceed twenty-five times the average diameter. The carrying capacity of such piles shall be determined by means of one or more test piles, and the allowable working load shall be not greater than one-half the test load under which the test pile begins to settle, nor greater than 350 lbs. per square inch.

(5). The concrete shall be mixed in the proportion of one part Portland cement, two parts of clean coarse sand, and four parts of broken stone or gravel of a size passing through a 1 1/4-inch diameter ring, with sufficient water to produce a plastic or viscous consistency.

(6). The clear space between the heads of concrete piles shall be not less than 16 inches.

The permissible load upon piles driven out of plumb, and the extent to which piles may be driven out of plumb before being condemned, shall be determined by the Building Inspector.

(7). No pile or group of piles shall be loaded eccentrically.

PART V.

WALLS

Section 19—Brick Walls and Walls in General

(1). Every building other than frame buildings shall be enclosed on all sides with independent or party walls of incombustible materials. This shall not preclude the construction of any story supported on piers entirely open to the outer air, provided that in all such buildings the floor and the ceiling of such open story shall be protected by incombustible material.

Quality of brick, Sec. 46.

(2). The masonry walls and piers of every building shall be properly and solidly bonded with mortar joints. They shall be built to a line and carried up plumb and straight.

All brick shall be thoroughly wet just previous to being laid.

(3). No wall of any building or structure shall be built more than two

stories in advance of any other portions of the walls of the buildings or structure; this provision need not apply to buildings where walls are carried independently by girders at each floor. All walls shall be securely anchored and bonded at points where they intersect.

(4). The walls and beams of every building during erection or alteration shall be securely braced wherever required until the building is enclosed.

(5). In brick walls every sixth course shall be a heading course, except where walls are faced with brick in Flemish bond, in which case the headers of every third course shall be full brick and bonded into the backing. Where running bond is used, it shall be bonded into the backing by cutting the corners of every brick of every sixth course of the face brick and putting in a row of diagonal headers behind the same, and suitable metal anchors shall also be used in the bonding course at intervals not exceeding 3 feet. Where face brick is used of a different thickness from the brick used for backing, the courses of the exterior and interior brickwork shall be brought to a level bed at intervals of not more than eight courses in height of the face brick, and the face brick shall be properly tied to the backing by a full heading course of the face brick or other approved method.

(6). Face brick shall be laid at the same time as the backing, and shall in no case be laid after the backing is in place.

(7). When walls of hollow blocks are veneered, as permitted in Section 28, the facing shall either be bonded to the backing with a row of headers every 16 inches, or be attached to the backing with approved metal wall ties bedded in mortar joints. Such ties shall not be spaced further apart on centers than one foot vertically and 2 feet horizontally. Such veneering shall not be considered a part of the required thickness of the wall. Brick facing or veneering may, however, be considered as part of a hollow terra cotta or concrete wall (or vice versa), provided the veneering is bonded at least 4 inches into the wall at intervals not exceeding six courses of brick. When veneering is used special care shall be taken to fill all joints flush with mortar around wall openings.

(8). No timber, except inside lintels, as described in Section 32, and nailing blocks not over 8 inches in length, shall be placed in any masonry wall.

(9). The walls of each story shall be built up the full thickness to the top of the beams above.

Foundation walls, Sec. 15.

Reinforced concrete walls, Sec. 136.

or hollow blocks.
Section 20—Piers *Masonry*

(1). Every pier shall be built of squared stone, stone concrete, or approved brick. Stone or brick piers shall be laid in Portland cement mortar. Every exterior pier shall be securely anchored to the beams or girders at the level of each tier. The height of any isolated pier shall not be greater than ten times its least horizontal dimension. Except in frame buildings, no masonry pier shall be less than 16 inches square.

(2). Interior piers shall not be built of stone, neither shall stone bonds or caps be used in such piers, except in frame buildings.

(3). Every exterior stone or brick pier less than 6 square feet in cross-section, which supports a beam, girder, arch or column upon which a wall rests, or a lintel spanning an opening over 10 feet wide on which a wall rests, shall have built into it, at vertical intervals of not more than 30 inches, approved bond stones, steel, or cast iron plates. Bond plates shall be full size of the pier.

Steel bond plates shall be not less than $\frac{1}{2}$ inch in thickness and shall be perforated by three holes per square foot of area; the diameter of the holes shall be not less than $\frac{3}{4}$ inch.

(4). Monolithic stone posts shall not be used for the support of columns, girders or walls.

Section 21—Stone Walls

(1). Every stone wall shall have one header extending through the wall in every 2 feet in height and every 3 feet in length. Headers shall be staggered. All headers shall be good, flat stones, not less than 12 inches wide and 8 inches thick.

(2). All stones shall be laid on their natural bed. No stone which does not bond into the wall at least 6 inches shall be used. Stones shall be firmly bedded in mortar with all spaces and joints thoroughly filled.

(3). Wall built of squared stone, with dressed level beds, shall have a thickness not less than that required for brick walls under similar conditions.

(4). Walls built of rubble stone shall have such increase of thickness over that specified for squared stone walls as may be required by the Building Inspector. Rubble stone walls shall not exceed three stories or 40 feet in height.

Section 22—Ashlar

(1). Stone or architectural terra cotta ashlar, or other approved material used for the facing of any building or structure, shall be not less than 4 inches thick. In stone ashlar, each stone shall have a reasonably uniform thickness, but all stones need not necessarily be the same thickness. Each block of ashlar or other approved facing, shall either be bonded into the backing, or be securely anchored to the backing with metallic anchors, at least one for each 30 inches lineal length of course, and the backing independent of facing, shall conform to the wall thickness required by this Code. Where every alternate course of facing is at least 8 inches thick and bonded into the backing, at least 4 inches, the ashlar may be counted as part of the thickness of the wall. No wall faced with ashlar shall be less than 12 inches thick.

Section 23—Mortar for Walls

(1). Foundations, footings and parapet walls shall be laid in Portland cement mortar, also arches over doorways and windows. All chimneys shall be laid in Portland cement mortar to which no lime has been added. Other brick walls may be laid in lime, lime and cement, or cement mortar. Hollow block walls shall be laid in Portland cement mortar.

Quality of mortar, Sec. 47.

Section 24—^{amended} Brick Wall Thicknesses

(1). All bearing walls shall be of sufficient thickness to support the load to be carried without exceeding the stresses specified in Section 57, but in no case shall such walls be less than 12 inches thick, unless built of reinforced concrete.

Thickness of reinforced concrete walls, Sec. 136.

(2). The minimum thickness of all brick bearing walls shall be in accordance with the following schedules and tables. In determining the thickness of walls for varying heights, they shall be measured to the nearest tier of beams or support, whether this be a foundation, a beam, or a girder.

Thickness of foundation walls, Sec. 15.

(3). **Walls for Dwelling House Class.** The expression "walls for dwelling house class" shall be taken to mean and include walls for all buildings

specified under Class C and D, as well as all other buildings used for temporary or permanent residence.

For all brick bearing walls of buildings of the dwelling house class, the upper three stories shall be not less than 12 inches thick, increasing 4 inches in thickness for each three stories or fraction thereof below. No three-story increment shall exceed 45 feet in height.

(4). Table indicating minimum thickness of walls in accordance with above requirements:

Dwelling House Class

Brick Bearing Walls

Stories.	1	2	3	4	5	6	7	8	9	10
1	12	....	....	....	....	....	....	....	....	....
2	12	12	....	....	....	....	....	....	....	....
3	12	12	12	....	....	....	....	....	....	....
4	16	12	12	12	....	....	....	....	....	....
5	16	16	12	12	12	....	....	....	....	....
6	16	16	16	12	12	12	....	....	....	....
7	20	16	16	16	12	12	12	....	....	....
8	20	20	16	16	16	12	12	12	....	....
9	20	20	20	16	16	16	12	12	12	....
10	20	20	20	20	16	16	16	12	12	12

(5). Walls for Warehouse Class. The expression "walls for warehouse class" shall be taken to mean and include walls for all buildings specified under Classes A, B, E, and F, in Section 8, as well as all other buildings used for similar purposes.

Excepting party and fire walls, brick bearing walls for all buildings of this class, not exceeding five stories or 65 feet in height, shall have the upper two stories not less than 12 inches thick, increasing 4 inches in thickness for each two stories or fraction thereof below. For such building in excess of five stories, but not exceeding ten stories or 125 feet in height, the top story shall be not less than 12 inches thick, increasing 4 inches in thickness for each two stories or fraction thereof below. No two-story increment shall exceed 30 feet in height.

(6). Table indicating minimum thickness of walls in accordance with above requirements:

Warehouse Class

Brick Bearing Walls

Stories.	1	2	3	4	5	6	7	8	9	10
1	12	....	....	....	....	....	....	....	....	....
2	12	12	....	....	....	....	....	....	....	....
3	16	12	12	....	....	....	....	....	....	....
4	16	16	12	12	....	....	....	....	....	....
5	20	16	16	12	12	....	....	....	....	....
6	24	20	20	16	16	12	....	....	....	....
7	24	24	20	20	16	16	12	....	....	....
8	28	24	24	20	20	16	16	12	....	....
9	28	28	24	24	20	20	16	16	12	....
10	32	28	28	24	24	20	20	16	16	12

(7). In all buildings, except dwellings, brick party walls and fire walls which serve as bearing walls on both sides, shall be not less than 16 inches thick in the upper two stories or upper 30 feet, increasing 4 inches in thickness for each two stories or fraction thereof below.

Thickness of non-bearing fire walls, Sec. 26.

(8). The height of a wall between lateral supports shall not exceed fifteen times its thickness unless strengthened by piers or cross walls, as the Building Inspector may direct.

When the clear span of a floor is greater than 25 feet in buildings of Classes A, B, E, and F, and greater than 26 feet in buildings of Classes C and D, the thickness of bearing walls shall be increased 4 inches over that specified in the foregoing tables for every $12\frac{1}{2}$ feet or fraction thereof that the said span exceeds 25 feet for buildings of Classes A, B, E, and F, or 26 feet for Classes C and D; or shall have in lieu of this increase of thickness, such piers or buttresses as the Building Inspector may direct.

Classification of buildings, Sec. 8.

(9). Every bearing wall faced with brick laid in running bond shall be 4 inches thicker than specified in the foregoing tables.

If any horizontal section through a bearing wall shows more than 30 per cent. area of flues and openings in a wall laid up in lime, or lime and cement mortar, or 45 per cent. in a wall laid up in Portland cement mortar, the said wall shall be increased a thickness of 4 inches for every 15 per cent. or fraction thereof for which the total area of flues and openings exceed 30 per cent. or 45 per cent. The total area of openings and flues in any bearing wall shall not in any case exceed 60 per cent.

(10). In all buildings, walls 12 inches thick, and over 60 feet in length; and walls 16 inches thick which are over 100 feet in length, shall be 4 inches thicker throughout than is required by this Code, unless they are properly braced by cross walls, pilasters, or buttresses.

(11). The thickness of non-bearing walls may be 4 inches less than that of bearing walls, provided that no non-bearing wall is less than 12 inches thick except it be of reinforced concrete.

Partition walls, Sec. 104.

Shaft walls, Sec. 104.

(12). In no case shall the thickness at the bottom of masonry retaining walls be less than one-quarter the height of the wall unless reinforced in an approved manner.

(13). Brick or concrete walls of buildings outside the fire limits, which under this ordinance could be of wood, may have a minimum thickness of 8 inches. Such walls shall not exceed two stories or 30 feet in height, exclusive of gables, nor shall they exceed 55 feet in length unless properly braced by cross walls, piers, or buttresses.

(14). **Panel or Enclosure Walls for Skeleton Construction.** In skeleton construction the panel walls shall be supported by girders at each floor level, and if of brick, shall be not less than 12 inches thick, laid in cement mortar. When the vertical distance between supporting girders exceeds 15 feet the thickness of the wall shall be increased 4 inches for each 15 feet or fraction thereof that the said vertical distance exceeds 15 feet. Such walls shall be of brick, stone or gravel concrete, or hard burned terra cotta.

Reinforced concrete walls, Sec. 136.

Terra cotta in skeleton construction, Sec, 104, par. 5.

Section 25—Curtain Walls

(1). Curtain walls over ^{two} three stories or 50 feet in height shall be laid in cement mortar, and shall be not less than ^{two} 12 inches thick for the uppermost ^{two} 50 feet thereof, or nearest tier of beams to that height, and increased 4 inches for every additional section of ^{two} three stories or 45 feet, or nearest tier of beams to that height. When such walls are used, the foundation of the buildings shall be so designed that the load from the columns and the load of the walls are carried together. Curtain walls shall be anchored to the ^{two} steel framing at each floor level, the anchors being spaced not further apart than 6 feet horizontally.

Section 26—Fire Walls

(1). Fire walls shall be built of brick laid in Portland cement mortar,

or of reinforced concrete. In fireproof buildings, brick fire walls supported by girders at each story, may be 12 inches thick throughout. In non-fireproof buildings, brick fire walls which do not serve as bearing walls shall be not less than 16 inches thick in the upper four stories or upper 50 feet, increasing 4 inches in thickness for each two stories or fraction thereof below. No such two-story increment shall exceed 30 feet in height. In frame buildings used for manufacturing or commercial purposes, and not exceeding two stories or 30 feet in height, non-bearing fire walls shall be not less than 12 inches thick.

(2). Every opening in a fire wall or a party wall, shall be protected on each side of the wall by an approved automatic fire door. No opening in any such wall shall exceed 80 square feet in area, except that by written permission of the Building Inspector, a larger opening may be had upon the ground floor only; but special precautions shall be taken to protect such opening, and in no case shall the total width of openings in any one story, other than the first story, exceed 25 per cent in linear length of the wall. Fire and party walls shall be continuous from foundation to 3 feet above roof level and be coped, except that such walls in fireproof buildings need not extend above the top of the roof beams.

(3). When three or more buildings used for stores, factories or warehouses, communicate by openings through separating fire walls, the openings shall be protected by double fire doors, and each building shall also be provided with a system of approved automatic sprinklers.

If an opening in a fire wall is made to serve as an emergency or horizontal exit, and is included in the calculations for exits, it shall not exceed 48 square feet in area, and a self-closing fire door shall be substituted for one of the automatic fire doors. The automatic door shall be controlled by an approved automatic release on each side of the wall.

Section 27—Parapet Walls

(1). All exterior or party walls over 20 feet high, except where such walls are finished as cornices, gutters, or crown mouldings, excepting also the walls of detached dwellings with peaked or hipped roofs, shall be furnished with parapets. Parapet walls shall be the full thickness of the top story walls and shall project at least 3 feet above the roof at all points, except that on dwellings the parapets may be reduced to 2 feet. All parapet walls shall be coped with approved durable material.

Section 28—Hollow Building Block Walls

(1). Hollow building blocks of hard burned terra cotta or of concrete may be used for all walls, except party and fire walls, of buildings not exceeding three stories or 40 feet in height, provided that such blocks have met the test requirements of Section 57, and are not stressed beyond the safe limits therein prescribed. The minimum thickness of such walls shall be as required for brick walls.

Thickness of walls outside fire limits, Sec. 177, par. 1.

(2). Concrete blocks shall not be used in construction until they have attained an age of 28 days, nor until they have developed the required test strength. All building blocks shall be laid in Portland cement mortar.

If a wall be built of blocks laid with the cells horizontal, which were designed to be normally laid with the cells vertical, or if band courses of such blocks with cells horizontal be laid in a wall otherwise built of the same

blocks with the cells vertical, the carrying capacity of such walls shall be calculated from the strength of the blocks tested with their cells horizontal.

Test requirements for hollow building blocks, Section 50.

(3). Hollow terra cotta blocks in exterior walls shall be either extra hard burned or be veneered with brick, architectural terra cotta, or stone, securely bonded and set as provided in Section 19, paragraph 8, or the blocks shall be covered on the exposed surface with at least $\frac{3}{4}$ inch of Portland cement stucco; such blocks shall be well scored, grooved or roughened to retain the coating. The stucco shall not be considered as a part of the required thickness of the wall.

(4). When hollow block walls, laid with cells vertical, are decreased in thickness, the blocks in the top course of the thicker wall shall be filled solidly with concrete, or the exposed openings in such top course may be covered with slabs of hard burned terra cotta or concrete at least 1 inch in thickness. Terra cotta, concrete or metal slabs or templates of approved size and thickness shall be placed under all floor beams and girders as bearing plates in order that the allowable working stresses shall not be exceeded.

Hollow blocks filled with concrete, Sec. 50, par. 10.

(5). Building blocks shall be so laid that the shells and webs shall be superposed upon the shells or webs of the adjacent block or blocks below.

(6). Hollow blocks when used to form lintels, which are not keyed arches, shall be reinforced with steel rods, and be filled solidly with concrete. Such lintels shall be designed in accordance with the unit stresses and other requirements for reinforced concrete as required in Section 136.

(7). Except for party or fire walls, hard burned terra cotta blocks may be used for walls of skeleton construction having a height not exceeding four stories or 55 feet. The thickness shall be the same as required for brick walls.

Terra cotta blocks faced with brick bonded in the manner specified in the last half of paragraph 7, Section 19, may be used for walls of skeleton construction to a height of 10 stories or 125 feet.

Panel walls for skeleton construction, Sec. 24, par. 14.

Hollow blocks for foundations, Sections 28 and 50.

Section 29—Existing Walls

(1). Where an existing party wall is to be incorporated in a new building of skeleton or curtain wall construction, the vertical extension of the existing party wall shall be supported entirely by columns and girders and not by the party wall below, except that such existing party wall may be extended vertically to the height permitted by this Code for its existing thickness, if written approval for such extension is given by the Building Inspector.

(2). Should it be desired to increase the height of other existing party or independent walls, which are less in thickness than required under this Code, this shall be done by lining with brickwork to form a combined thickness with the old wall of not less than 4 inches more than the thickness required for a new wall corresponding with the total height of the wall when so increased in height. Such lining shall be supported on proper foundations and carried up to such a height as the Building Inspector may require. All linings shall be at least 8 inches in thickness, laid up in cement mortar, bonded with 4 inch by 16 inch brick toothing projecting 4 inches into the old wall at least every 7 feet both horizontally and vertically, and shall be thoroughly anchored to the old brick walls with suitable wrought iron or steel anchors, placed 2 feet apart and properly anchored into the old walls by through bolts or by expansion bolts set in cement or by other approved method. The anchors shall be placed in rows alternating vertically and horizontally with each other, the old walls being first cleaned of plaster or other

coatings where any lining is to be built against the same. No wall shall be lined unless in good condition, and then not until written permission so to do has been granted by the Building Inspector.

Section 30—Furred Walls and Hollow Walls

(1). The inside 4 inches of all walls may be built of hard burned hollow brick the dimensions of ordinary brick, properly tied and bonded into the walls. Terra cotta, concrete, or gypsum tile or blocks used as lining or furring shall not be considered as forming part of the required thickness of any wall.

(2). In all hollow walls of stone, brick or concrete, the same net horizontal section shall be used as if they were solid. The parts of hollow walls shall be connected by approved ties of brick, stone, or metal, placed not over 24 inches apart horizontally and vertically. Metal ties shall have the ends bent at right angles, and be not less than 1 inch wide by $\frac{1}{4}$ inch thick, and shall extend into the wall on each side not less than 4 inches.

Section 31—Recesses and Chases in Walls

(1). Recesses for stairways or elevators may be located within the required thickness of foundations or cellar walls, provided the walls are not thereby reduced to a less thickness than that required for a fourth story wall. Reinforcement shall be supplied where necessary to compensate for the diminished thickness as approved by the Building Inspector.

The brick backing of recesses for alcoves and similar spaces shall be not less than 8 inches thick.

(2). No pipe chases shall extend into any wall more than one-third of its required thickness. No horizontal chase shall exceed 4 feet in length in any wall without express permission of the Building Inspector. No recess in a wall shall be made within a distance of 6 feet from any other recess in the same wall.

Chases shall not be permitted with the required area of any pier. Chases or recesses in walls built of hollow blocks shall not be formed by cutting of blocks, or by other method which would impair the strength of the wall.

Neat fitting metal sleeves, or asbestos covering, shall be provided around pipes at each floor level, and the chases at these levels shall be filled with solid masonry for the space of one foot in height.

Section 32—Arches and Lintels

(1). Openings for doors and windows shall have arches or lintels of masonry or metal, which shall have a bearing at each end of not less than 5 inches on the wall. Bearing plates shall be provided for lintels resting on walls where the span is more than 6 feet. Tie rods shall be used in all arches where necessary to resist the thrust.

Mortar for arches, Sec. 23.

(2). On the inside of openings less than 4 feet in width in walls of non-fireproof buildings in which lintels or arches may be less than the thickness of the wall to be supported, timber lintels may be permitted which shall rest at each end not more than 2 inches on any wall, and be chamfered or cut to serve as center for a rowlock or keyed arch.

Section 33—Walls of Unfinished Buildings

(1). Any building, the erection of which was commenced in accordance with specifications and plans submitted to and approved by the Department of Buildings prior to the passage of this Code, if properly constructed, and in safe condition, may be completed or built upon in accordance with the requirements of law as to thickness of walls in force at the time when such specifications and plans were approved.

PART VI.

HEIGHTS AND AREAS

Section 34—Height of Buildings

(1). No building, or structure hereafter erected, except church spires, water towers, smoke stacks or chimneys, shall exceed in height two and one-half times the width of the widest street upon which it fronts, nor shall it exceed the following limits:

	Height in Stories	Height in Feet
Frame buildings used for purposes other than dwellings and tenements	2	30
Frame dwellings and tenements occupied by not more than two families	2½	30
Frame dwellings occupied by not more than one family.....	3	35
Buildings having bearing walls of hollow terra cotta or concrete blocks	3	40
Non-fireproof buildings, ordinary construction	4	55
Non-fireproof buildings, mill construction.....	5	65
Fireproof buildings used for factories, stores, warehouses or workshops	7	85
Fireproof buildings used for purposes other than factories, stores, warehouses or workshops	10	125

(2). If a single story building exceeds 30 feet in height the roof shall be constructed entirely of incombustible materials, and all metal framework of same shall be protected with fireproofing.

(3). A single story building not exceeding 30 feet in height may have a roof monitor not exceeding 10 feet in height.

(4). No story of any building above the first story shall exceed 15 feet in height.

Definition of height, Sec. 5, par. 41.

Effect of pent houses on height, Sec. 73, par. 3.

Section 35—Allowable Floor Areas

(1). In every building of this character named in this section the maximum area of any floor between fire walls or exterior walls, either without or with a full equipment of automatic sprinklers, shall be as follows:

Non-Fireproof Construction —

- (a). Tenement houses, 3000 sq. ft.
 (b). All other ordinary non-fireproof buildings, height not exceeding 55 feet.

Fronting on	Without Sprinklers	With Sprinklers increase of 66 2/3 per cent.
One street	5,000 sq. ft.	8,333 sq. ft.
Two streets	6,000 sq. ft.	10,000 sq. ft.
Three or more streets	7,500 sq. ft.	12,500 sq. ft.

- (c). Mill construction buildings, height limit 65 feet.

Fronting on	Without Sprinklers	With Sprinklers increase of 100 per cent.
One street	6,500 sq. ft.	13,000 sq. ft.
Two streets	8,000 sq. ft.	16,000 sq. ft.
Three or more streets	10,000 sq. ft.	20,000 sq. ft.

Area of frame buildings, Sec. 176.

Fireproof Construction—

- (a). All buildings of Classes A, B, C, and D..... } No
Light and power stations..... } restrictions
Office buildings } as to area.
- (b). All other buildings not exceeding 65 feet in height.

Fronting on	Without Sprinklers	With Sprinklers increase of 66 2/3 per cent.
One Street	10,000 sq. ft.	16,666 sq. ft.
Two Streets	12,000 sq. ft.	20,000 sq. ft.
Three or more streets	15,000 sq. ft.	25,000 sq. ft.

- (c). Stores, warehouses, factories, and workshops not exceeding 85 feet; and other buildings not exceeding 125 feet in height.

Fronting on	Without Sprinklers	With Sprinklers increase of 50 per cent.
One Street	7,500 sq. ft.	11,250 sq. ft.
Two streets	10,000 sq. ft.	15,000 sq. ft.
Three or more streets	12,500 sq. ft.	18,750 sq. ft.

- (d). The first floor only of any fireproof building occupied as a store may have an area of 20,000 sq. ft., and if fully protected by approved automatic sprinklers may be increased 50 per cent or have a maximum area of 30,000 sq. ft.

PART VII.

ALLOWABLE LOADS

Section 36—Floor Loads

amended

(1). Each floor of every building shall be of sufficient strength in all its parts to bear safely the weight to be imposed thereon, in addition to the weight of the floor itself. It shall safely support a minimum live load per square foot of area as specified in the following table:

Class of building.	Live Loads.	
	Pounds per Ground and lower floors	Square Foot. Upper floors.
(2). Foundries, light and power plants, printing and lithographing houses, railroad freight depots	250	250
Warehouses	200	200
Car barns, garages	150	120
Fire houses	150	60
Armories, ball rooms, dance halls, exhibition buildings, factories, gymnasiums, work shops, lofts, markets, stables, stores, public halls, restaurants.....	120	120
Railway passenger stations	120	90
Office buildings	120	75
Court houses	100	100
Churches, libraries, museums, theatres.....	90	90
Schools and colleges	90	75
Asylums, bath houses, club houses, detention buildings, dormitories, hospitals, hotels, lodge rooms, lodging houses, studios	90	60
Tenant houses and dwellings	60	40

Definition of live load, Sec. 5, par. 45.

(3). Any floor beam in a building of Class E shall be capable of sustaining a live load at its center of at least 4000 pounds.

No safe shall be placed on a stair landing or in a stair hall, nor shall

its weight be carried by any beam which also carries the floor of any stair landing or stair hall.

amended
Section 37—Roof Loads

(1). Every roof with a pitch of less than 20 degrees with the horizontal, shall be proportioned to bear safely a live load of 50 pounds per square foot of surface. If the pitch be more than 20 degrees, the live load shall be assumed to be 30 pounds per square foot measured on a horizontal plane.

(2). Every column, post or other vertical support shall be of sufficient strength to bear safely the combined live and dead loads transmitted to it.

Columns eccentrically loaded, Sec. 134.

(3). In buildings more than five stories in height, the following reductions are permissible: For columns supporting roof and top floor, no reduction; for columns supporting each succeeding floor, a reduction of 5 per cent of the total live load per floor may be made, but the total deduction shall not exceed 50 per cent.

(4). No reduction of live load on columns shall be permitted in buildings where the assumed floor load is more than 120 pounds per square foot and is likely to be permanent in character, as in warehouses, printing houses, machine shops, etc.

(5). For structures carrying machinery, such as cranes, conveyors, printing presses, etc., at least 25 per cent shall be added to the stresses from live loads to provide for effect of impact and vibrations.

Section 38—Sidewalk Loads

(1). For sidewalks between the curb and building lines, live loads shall be taken at 300 pounds per square foot or a concentrated load of 5 tons at any point.

Section 39—Strength of Existing Floors to be Computed

(1). In every existing building of Classes E and F, erected and occupied before the adoption of this Code, the weight that each floor will safely sustain shall be computed by a competent person employed by the owner or occupant. Such computations shall be filed in the Bureau of Buildings with an affidavit by the person making the same, in such manner as the Building Inspector may direct, and shall give full information on which the computations are based. When the safe live loads on any existing floor thus ascertained has been approved by the Building Inspector, he shall post one or more copies of such approved live load in such conspicuous place or places on each story as may be designated by the Building Inspector, and no floor shall be loaded in excess of the safe allowance mentioned in said posted copy.

Classification of buildings, Sec. 8.

PART VIII

MEANS OF EGRESS

Section 40—Number and Width of Exits and Doors

(1). Every building, except dwellings, and every story in each building above the first, shall have at least two means of exit remote from each other; one of these shall open to a street or fireproof passage leading to a street, and one may open to a yard or other space deemed safe by the Building inspector, and of sufficient area to accommodate all persons in the building. Two means of exit remote from each other shall be provided from each story of dwellings when over 3 stories in height.

(2). In every building except buildings of Class D, all required exit doors in the first story, including the doors of vestibules, shall open outwards. This requirement shall not prohibit the use of doors which swing

both inwards and outwards, not of sliding or rolling doors in stables, garages, storerooms, and the shipping and receiving rooms of manufacturing, mercantile and industrial buildings, where approved by the Building Inspector.

(3). When exit doorways have a clear width of at least 40 inches each, the aggregate widths of such doorways shall be equal to the required width of corridor or stairway served by same. When individual doors are less than 40 inches wide, there shall be one doorway for each 22 inches of required width of corridor or stairway leading to the same. Every doorway shall be at least 28 inches wide in the clear. All passageway exit doors shall swing in the direction of exit travel, except in case of horizontal exits where direction of travel may be indeterminate.

All exit doors leading from rooms having an occupancy of 15 or over, shall open in the direction of exit travel.

(4). The opening of one door shall not be permitted to obstruct another, and the arc of opening of doors which open upon stairway landings or platforms shall not reduce the width of the passageway to less than the required width of the stairs.

(5). Every room having an occupancy of more than 75 persons shall have at least two doorways remote from each other leading to exits.

(6). Hallways or corridors at the street or court level furnishing exit from stairways, shall be not less in width than the aggregate width of the required stairways which they serve. Every hallway or corridor which may serve as an exit for 50 or more persons, shall have at least 44 inches of width for the first 50 persons and 6 inches additional for each additional 50 persons to be accommodated thereby. This computation shall be based on the number of persons in the story having the largest occupancy served by said corridor.

(7). At all times when any loft or space is occupied for manufacturing or mercantile purposes, the fastenings or locks on exit doors shall be such as may be easily opened from the inside without the use of keys.

(8). A clearly painted sign marked "EXIT" in letters not less than 6 inches in height, shall be placed over all exits in the above specified buildings. The elevators shall be provided with similar signs marked "ELEVATOR." Such signs shall be illuminated when necessary by means of artificial lighting. The color of such light shall be green.

(9). Elevators, escalators and revolving doors shall not be considered in calculating exit requirements.

(10). Entrances and doors in tenement houses, theatres, motion picture theatres, and places of public or private entertainment, shall be as elsewhere provided in this Code.

Theatres, Sec. 186.

Moving picture theatres, Sec. 220, par. 9.

Assembly Halls, Sec. 221.

Section 41—Stairs and Stairways, Construction of

(1). All buildings which are used above the first floor for manufacturing or business purposes, or for public assemblage, or for any purpose whatever if over three stories or 40 feet high, except armories, court houses, dwellings, fire houses, jails, libraries, museums, police stations, prisons, railway stations, and similar buildings, shall have the required stair shafts separately and continuously enclosed, as specified in Sections 80 and 81. In fireproof buildings all stairs, platforms, landings, and stair hallways, including the flooring, shall be of fireproof construction. Storage of combustible material is prohibited within the stairway enclosure.

Enclosures for stair hallway, same as stair shaft, Sec. 104, par. 7.

(2). All stairs, platforms, landings, balconies and stair hallways, shall be of sufficient strength to sustain safely a live load of not less than 100

pounds per square foot for interior construction, and 150 pounds per square foot for exterior construction, with a factor of safety of 4 in each case; and except in dwellings shall conform to all the requirements of this section as to hand rails, newels, landings, widths, exits, and prohibition against winding treads. The space beneath any stairway built in whole or in part of combustible material shall be left entirely open or be completely enclosed without door or other opening.

(3). No stories in any building shall be connected by an open shaft or stairway except dwellings and buildings mentioned in paragraph 1; also theatres as provided in Section 191.

(4). Stairways used as required means of exit shall be at least 44 inches wide between faces of walls, or 40 inches wide between face of wall and an open balustrade, or between two open balustrades. All such widths shall be clear of all obstructions except that hand rails attached to walls may project not more than $3\frac{1}{2}$ inches within them. If newels project above tops of rails, a clear width of at least 44 inches shall be provided between the faces of the newel and the face of the wall or newel opposite. All stairs shall have walls or well secured balustrades or guards on both sides, and except in dwellings, shall have hand rails on both sides. A stairway of 7 feet or more in width shall be provided with a continuous intermediate hand rail substantially supported. All stairs shall have treads and risers of uniform width and height throughout each flight; the rise shall be not more than $7\frac{3}{4}$ inches, and the tread exclusive of the nosing not less than $9\frac{1}{2}$ inches. Stairways exceeding 12 feet in height shall have an intermediate landing.

Buildings in which there may be a congregation of people for civic, political, educational, religious or amusement purposes, except as provided for theatres in Section 220, and in those used for the care or treatment of persons, all stairs exceeding 8 feet in height shall have an intermediate landing. All landings shall be at least 3 feet in length.

(4). No arrangement of treads known as winders shall be permitted in required stairways between the level of the top floor and the street, excepting in public and other special buildings when the use and arrangement is approved by the Building Inspector.

(5). Whenever the treads or landings are of slate, marble, stone or composition, they shall be supported for their entire length and width by a solid metal plate at least $\frac{1}{8}$ inch thick, securely fastened. If stairs are of incombustible material, other than metal, and treads and landings are each solidly supported for their entire length and width by masonry, metal supports for treads may be omitted.

(6). All stairways that serve as required means of exit for one or more of the upper four stories of every building shall be continued their full width to the roof, and shall lead by a direct line of travel to the first story, and open directly on the street, or to an open-air or fireproof passage leading to the street, or to a yard or court connected with the street. Such fireproof passage shall be not less than 7 feet in height.

(7). The continuity of all stairs which may be used for exit purposes, shall be interrupted at street level by partitions or doors or other means which will indicate the main floor level and make clear the direction of egress to the street.

(8). Every enclosed stairway shall be provided with an adequate system of lighting, arranged to insure reliable operation when through accident or other causes the regular lighting is extinguished.

(9). All required stairways shall be constructed in one of the following three ways, and shall be known as stair exits:

(a). **Enclosed Interior Stairways.** The stairs, landings, platforms,

and passageways connected therewith, shall be completely enclosed by fire-proof partitions of the standard required in Sections 104 and 105, except that no glass panels shall be permitted in the doors in buildings of Class A not exempted in paragraph 1.

(b). **Smokeproof Tower.** The stairs, landings, and balconies or platforms, shall be solid and completely enclosed as required for interior stairways in Section 79, and shall extend from the sidewalk, court, or yard level, to and above the roof to form a bulkhead. There shall be no openings in any wall separating the stairway from the building, but fixed or automatic fire-windows sufficient for lighting purposes are not objectionable in the exterior walls, provided they are not subject to fire exposure hazard from the same or nearby buildings. Access shall be provided to the stairway from every story of the building by outside balconies of steel or masonry, or by vestibules within the walls of the building but open on at least one side. Every such balcony or vestibule shall have an unobstructed width of at least 44 inches, and shall open upon an open space not less than 100 square feet in area. The balcony or vestibule shall be provided with a solid incombustible floor. Railings of steel, or other approved incombustible material, shall be provided not less than 4 feet high. Access to the balcony or vestibule from the building and to the stairways from the balcony or vestibule shall be by approved self-closing fire doors not less than 40 inches wide and 7 feet high, which shall swing in the direction of exit travel. The doors shall be provided with locks or latches, with visible fastenings, requiring no keys to open them. A wired glass panel shall be provided in the door opening into the stair shaft of not less than one-third its area. The level of the balcony or vestibule floor shall be not more than 7¼ inches below the door sill of the building. Landings in such stairways shall be of a width that the doors in openings into the stairway shall not reduce the free passageway of the landing to a width less than the width of the stairway.

(11.) (c) **Outside Exit Stairways.** Such stairs shall be connected to each story by means of an approved self-closing fire door and incombustible balcony. The door shall be not less than 40 inches wide, and the balcony shall be the same width as the stairs. All wall openings within 10 feet of such stairs shall be protected by approved self-closing fire doors on doorways, and automatic or fixed fire windows on window openings. No riser on such stairs shall be nearer than 4 feet to any such wall opening, except to doors giving access to the same. Metal mesh or other rigid guards at least 4 feet high shall be provided on each side of such stairway throughout. Provisions shall be made to properly drain the stairs and landings.

Horizontal exit, Sec. 42, paragraphs C and 1.

Stairways in Theatres, Sections 191, 192, 193 and 194.

Section 42—Requirements for Exits and Stairways

(1). Every building hereafter erected, and every building altered or converted to increase its occupancy, excepting dwellings, tenement houses, theatres, and assembly halls, which are elsewhere provided for, shall have exits and stairways as required in this section.

(2). (a) The term floor area in this section shall mean the entire space in a given story between exterior walls, fire walls or fire exit partitions, except that in computing such area the space occupied by walls, partitions, columns, and all shafts may be excluded.

(b) The term stair exit in this section shall be as required in paragraph c, Section 42.

(c) The term horizontal exit shall be understood to mean one or more

openings through or around a fire wall, fire exit partition, or any wall separating two buildings; no such opening shall be less than 30 inches wide: Or such an exit may be an exterior bridge or balcony connecting two buildings or two floor areas of the same building. Where there is a difference in level between connected buildings or floor areas, gradients shall be provided of not more than 1 foot in 6 feet where practicable. The bridges or balconies shall be not less than 44 inches wide, and shall be constructed of incombustible material, and enclosed on the sides at least 4 feet high. All exterior exposing openings in connected buildings or floor areas within 10 feet of bridge or balcony shall be protected by fire doors or fire windows with fixed or automatic sash. The floor of a bridge or balcony shall be not more than 7 $\frac{3}{4}$ inches below the door sill opening upon it; the connecting floor within the building shall be not more than 1 inch below the sill. Every such bridge or balcony when enclosed shall be provided with means for lighting.

Fire exit partitions to provide horizontal exits, Sec. 43.

Fire walls as horizontal exits, Sec. 26, par. 3.

(1). All horizontal exits shall be provided with self-closing fire doors. Such doors shall be kept unlocked during the occupancy of any portion of the floor areas or connected buildings. No glass shall be used in such doors when used on exits through fire walls as provided in Section 26, paragraph 3. Wired glass may be used in doors in other horizontal exits provided it conforms to the requirements of Section 5, par. 11.

The available floor area on each side of a horizontal exit shall be sufficient for the joint occupancy on the basis of not less than 3 square feet of unobstructed space per person, and shall be provided with at least one stairway as defined in Section 43.

(2). In all buildings not exempted in paragraph 1 of this section, one of the two required means of exit from every floor area above the first floor shall be a stair exit, and the other may be a stair exit or a horizontal exit. No part of any floor area above the first floor, excepting buildings of Class F, shall be more than 100 feet distant from an entrance to one such means of exit.

When a building over 35 feet in height is occupied for business purposes on the lower floors and for the home of not more than two families on the floors above, at least one continuous enclosed stairway shall be provided to the street level through the stories occupied for business.

(b) In buildings of Class E, over 55 feet high, except office buildings, one of the two required means of exit shall be either a smoke-proof tower or an interior enclosed stairway with self-closing doors opening into hallways which are also enclosed with fireproof partitions as specified in Section 43, paragraph 1.

(c) In every building over 90 feet in height one of the required means of exit shall be a smokeproof tower or a horizontal exit as herein defined.

(3). In determining the occupancy of any building, the width of stairways required for any floor area above the first floor shall be determined by the number of persons occupying such floor area, computed on the basis of fourteen persons for each 22 inches width of stairway, plus one person for every 3 square feet of hallway floor and stairway landings in the story height of such floor, excepting that in any building where a system of automatic sprinklers is installed throughout the entire building, as required in Section 182, the number and width of stairways may be computed on the basis of twenty-one persons for each 22 inches width of stairway; and excepting that when horizontal exits are provided as required in paragraph 2 (c) of this section, the number and widths of required stairways for floor areas above the first floor may be diminished to a basis of fifty persons for each 22 inches width of horizontal exit, provided that in no case there

shall be less stairway or means of exit than required in paragraph 2 of this section.

Exits shall also be provided from the cellar, basement, and first story of every building as may be required by the Building Inspector.

Section 43—Fire Exit Partitions

(1). Partitions, erected to furnish horizontal exits, shall be built of fireproof materials. No construction shall be used for such partitions less than 5 inches thick, unless it has been approved after a fire test as prescribed in Section 162, paragraph 4; in no case shall such partition be less than 4 inches if of block or tile construction; less than 3 inches thick if of reinforced concrete or solid metal lath and cement plaster construction, except as herein permitted for non-fireproof buildings.

When tile or block partitions are less than 5 inches thick, substantial protected reinforcement shall be provided at intervals not exceeding 20 feet in length to resist the effect of buckling due to heat.

Requirements for horizontal exits, Sec. 42, par. 2(c).

(2). Fire exit partitions shall be supported at each floor, and shall be securely anchored to the walls, floor, and ceiling of the rooms which they subdivide. In fireproof buildings such partitions shall rest upon the fireproofing of the floor.

(3). In non-fireproof buildings fire exit partitions shall be not less than 3 inches thick if of block or tile construction, and not less than 2½ inches thick if of reinforced concrete or solid metal lath and cement plaster construction, and shall be continuous through all stories of the buildings and be placed one above the other. The space between floor joists included between the top of a partition in one story, and the bottom of the corresponding partition in the story above, shall be completely fire-stopped with incombustible material.

Fire-stopping of partitions, Sec. 87, par. 3.

(4). Doorways in fire exit partitions shall be not more than 60 feet apart, but doorways may be omitted if approved means of exit around the partitions are provided. No openings other than doorways protected by fire doors, shall be placed in such partitions except that fire windows not exceeding ½ of 1 per cent. of the area of the partition may be permitted where strictly necessary for purposes of observation. Such fire windows shall have fixed sash, and may be placed either in the partition itself or in the doors. Windows placed in partitions shall also be protected by automatic closing fire shutters. No single pane shall exceed 144 square inches in area, and not more than one pane shall be placed in a door.

Section 44—Exits and Protection for Existing Buildings

(1). Where the exit facilities of existing buildings are found by the Building Inspector to be inadequate, additional exits, sprinklers, or other protection shall be provided of approved types.

In case the Building Inspector may have declared an existing building unsafe, and ordered increased exit facilities, sprinklers or other protection, appeal may be made from such order to a Committee of Surveys, as provided in Section 243. The decision of that survey shall be final, and when it has been complied with, the Building Inspector shall issue a certificate of occupancy to accord with such decision.

Certificate of occupancy, Sec. 6.

Engineers' Stationary Ladders. Every building in which high-pressure steam boilers are placed in the cellar or lowest story shall have stationary iron ladders or stairs from such story leading direct to a manhole through

the sidewalk or other outside exit in addition to another approved means of entrance and exit.

PART IX
TESTS, QUALITY, AND WEIGHT OF
MATERIALS

Section 45—Strength Test Requirements

(1). All building materials shall be of a quality to meet the requirements of this Code, and the test specifications promulgated by the Building Inspector in accordance with the requirements of Section 162, pars. 1 to 9.

(2). All tests shall be conducted under the supervision or direction of the Building Inspector. Laboratory tests shall be made at some Testing Laboratory of recognized standing by a reputable, competent, and disinterested expert acceptable to the Building Inspector. The tests shall be at the expense of the owner or builder. The test certificate shall state the source of the test specimens, the method of test, and the results obtained. Original signed copies of the certificates shall be furnished the Building Inspector and shall be kept on file in his office subject to public inspection.

(3). The Building Inspector may at his discretion accept certified reports of tests made by responsible persons, provided such reports show that the material, appliance or method of construction have met the test requirements of this Code.

(4). Materials, appliances or methods of construction which have been tested and approved shall be used and installed in the same manner in which they were tested for approval.

(5). Additional tests shall be made from time to time at the discretion of the Building Inspector.

Strength tests for floor construction, Sec. 165.

Specifications for fire tests, Sec. 162.

Section 46—Brick

(1). All bricks used in buildings, except those used for fire-stopping, Section 87, shall be sound, hard burned, or other approved brick of regular shape. Second-hand brick shall be thoroughly cleaned before being used. Not more than 15 per cent shall be bats or broken brick.

(2). Brick tested for approval shall develop an average strength of 3000 lbs. per square inch, and no sample shall fall below 2000 lbs. per square inch. Brick shall be tested flatwise (half bricks permitted), and the average shall be taken on at least five samples. The averages allowable absorption shall not exceed 15 per cent.

Section 47 (a)—Lime

Sand used for building construction shall be sharp, clear, coarse, and silicious.

Sand for reinforced concrete, Section 111.

(1). Slaked lime (lime putty) shall be made from well-burned quick lime, free from ashes, clinker, and other foreign material.

(2). Dry hydrated lime shall be the finely divided product resulting from mechanically slaked pure quick lime at the place of manufacture.

(3). Lime shall be of quality to meet the specifications of the American Society for Testing Materials.

Section 47 (b)—Lime Mortar

(1). Lime mortar shall be made of one part by volume of slaked lime (lime putty), or dry hydrated lime, and not more than four parts by volume of sand.

Section 48—Cements

(1). Portland cement and Natural cement shall meet the respective requirements of the current Standard Test Specifications of the American Society for Testing Materials for those cements, and any other require-

ments of the Building Inspector. No caked or lumpy cement shall be used.

Section 49—Gypsum Mortar or Plaster

(1). A mortar or plaster composed of 1 part retarded gypsum, and not more than 3 parts sand, with binding material when necessary. For gypsum blocks, see Section 5, paragraph 39.

Section 50—Building Blocks

(1). The term "block" as used in this section shall mean any shape of block, brick or tile which forms a hollow or cellular wall.

(2). Terra cotta blocks for bearing walls shall be dense, and hard-burned or vitreous.

Portland cement only shall be used in the manufacture of concrete blocks, and the coarse aggregate shall be of suitable material graded in size, but in no case shall the maximum dimension exceed one-half the width of the minimum section of the finished block.

(3). All building blocks used for bearing walls shall be marked or branded for identification and such marks or brands shall be registered with the Building Inspector. No make of blocks shall be used in any structure until the requisite number of samples have successfully met the test requirements of this section, and have been approved by the Building Inspector.

Tests shall be made to establish the working stresses to govern the use of blocks of each particular mark or brand. A series of ten full size blocks shall be selected by the Building Inspector from average quality stock, either at the factory, or from stock delivered for use at a building, and shall be tested for compression.

(4). Concrete blocks shall be not more than 36 days old when tested.

(5). The compressive strength of building blocks shall in all cases be calculated upon the gross sectional area of the bedding faces including the cellular spaces.

All blocks submitted to test shall be bedded in plaster of paris or cement to secure an even bearing.

Two piece blocks shall be tested in pairs as set to form the two faces of the wall. The strength requirement shall be the same as for hollow blocks, and it shall be calculated upon the gross sectional wall area which would be formed by the two blocks and the space between them.

(6). The average ultimate compressive strength for terra cotta blocks designed to be normally laid with the cells vertical, and which are tested with the cells in that position, shall be not less than 1200 lbs. per square inch. The allowable working stress on such blocks shall not exceed 120 lbs. per square inch.

(7). The average compressive strength of terra cotta blocks which are designed to be normally laid with the cells vertical, but are tested with the cells horizontal, shall be not less than 300 lbs. per square inch, and no block of the set shall test less than 200 lbs. per square inch. The allowable working stress on such blocks when laid with the cells horizontal, shall not exceed 30 lbs. per square inch.

Requirements for hollow block walls laid with cells horizontal, Sec. 28.

(8). The average ultimate compressive strength for terra cotta blocks designed to be normally laid with the cells horizontal, and which are tested with the cells in that position, shall be not less than 800 lbs. per square inch. The allowable working stress on such blocks shall not exceed 80 lbs. per square inch.

(9). The average compressive strength for concrete blocks when tested with the cells vertical, shall be not less than 800 lbs. per square inch, and 300 lbs. per square inch with no block testing at less than 200 pounds per square inch if tested with the cells horizontal. The allowable working stress for such blocks shall not exceed 80 lbs. and 30 lbs. per square inch respectively.

(10). Hollow building blocks may be filled solidly with Portland cement concrete or cement mortar to increase the stability and to aid in distributing the load, but the allowable working stress on such blocks shall not be greater than that permitted for unfilled blocks.

(11). The absorption of building blocks used for bearing or panel walls, determined by taking the average test of three blocks, shall not exceed 10 per cent. in 48 hours, and shall not exceed 15 per cent. in any case.

(12). Hollow building blocks shall not be used in fireproof buildings until they have successfully withstood a two-hour fire test as specified for partitions in Section 162, par. 4.

Walls of hollow building blocks, Sec. 28.

Hollow walls veneered, Sec. 19, par. 7.

Section 51—Terra Cotta Floor Tile

(1). Terra cotta floor tile, when tested on end and faced with Portland cement, shall give an average compressive strength of not less than 2500 lbs. per square inch of net area. The average strength shall be computed from the results of test of ten average tile.

Working stress for terra cotta floor tile, Sec. 50, pars. 6, 7 and 8.

Section 52—Concrete

(1). All mass concrete shall consist of a medium wet or plastic mixture of cement, sand, and stone, gravel, or other hard durable material, of such proportions as shall be approved by the Building Inspector, unless specified by this Code. The sand and cement shall be of quality specified in Sections 111 and 48, and the coarse aggregate, where not specified by this Code, shall be as approved by the Building Inspector.

Concrete for footings, Sec. 136.

Quality of reinforced concrete, Sec. 109.

(2). All concrete shall be mixed, deposited and protected as required for reinforced concrete in Sections 143, 144 and 145.

All forms and centering shall be built plumb and to true lines in a substantial manner, with joints sufficiently tight to prevent the leakage of the cement mortar. They shall be properly supported and braced to safely sustain both the dead load and the live load that may be placed upon them during construction.

(3). All tests on concrete shall be made in accordance with the requirements of Sections 162 and 163, but the test strength of concrete other than that used with reinforcement shall be as specified by the Building Inspector.

Test requirements for reinforced concrete, Sec. 164 and 165.

Section 53—Structural Timber

(1). All timbers and wooden beams used in building shall be of good sound material, free from rot, large and loose knots, shakes, or any imperfection whereby the strength may be seriously impaired.

Timber construction, Sec. 66.

Working stresses on timber, Sec. 57, par. 4.

Section 54—Structural Steel and Iron

(1). All wrought and cast structural steel and iron shall conform to the test requirements of the current Standard Specifications of the American Society for Testing Materials.

(2). Rivet steel shall have an ultimate strength of 46,000 to 56,000 lbs. per square inch.

(3). All other structural steel shall show an ultimate strength of 55,000 to 65,000 lbs. per square inch.

(4). No second-hand rolled shapes shall be used in any structure without the written permission of the Building Inspector.

Quality of concrete reinforcement bars, Sec. 113.

(5). **Steel Castings** shall be made from open hearth steel of soft or medium grade, and shall be practically free from blow-holes, with a reasonably clear skin and sharpness to pattern, and shall show an ultimate tensile strength of 60,000 to 70,000 lbs. per square inch.

(6). **Cast Iron** shall be of good foundry mixture, producing a clean, tough, gray iron. Castings shall be free from serious blow-holes, cinder spots, and cold shuts. Transverse tests on cast iron shall be made upon the 1¼-inch diameter "Arbitration Bar" of the American Society for Testing Materials. The bar to be supported on 12-inch centers, loaded at the middle, and in no case shall it test at less than 2900 lbs. Tensile tests optional.

Section 55—Weight of Materials

The weights of various materials shall be assumed to be as follows:

	Pounds per Cubic Foot
Brickwork—Ordinary	120
Brickwork—Pressed brick	130
Concrete—Cinder, used for floor arches or slabs, well-tamped	108
Concrete—Cinder, used for filling, not tamped	60
Concrete—Stone, or gravel <i>Local Stone</i>	144 <i>125</i>
Granite, Bluestone, and Marble	170
Limestone	145
Sandstone	145
Oak	50
Spruce and Hemlock	30
White Pine	27
Yellow Pine, Grade I (see Sec. 65, Note 2)	42
Yellow Pine, Grade II	35
Maple	43
Birch	45
Douglas Fir and Cypress	35

PART X

WORKING STRESSES

Section 56—Computation for Working Stress

(1). The required dimensions of each piece of material and of each form of construction to be used in buildings shall be computed, according to the rules prescribed by this Code, supplemented by those which may be promulgated by the Building Inspector.

(2). **Factors of Safety.**—Where the Code furnishes neither a unit working stress, nor a factor of safety for a material, the relation of allowable working stress to ultimate strength shall be determined by the Building Inspector.

Section 57—Permissible Working Stresses

(1). The safe carrying capacity of the various materials of construction, when not otherwise specified, shall be determined by the following working stresses in pounds per square inch of sectional area:

(2). **Steel and Iron.**

COMPRESSION IN SHORT BLOCKS		Pounds per Square Inch
Rolled steel		16,000
Cast steel		16,000
Cast iron		16,000
Steel pins, shop and power driven field rivets (bearing).....		20,000
Steel field rivets (driven by hand) (bearing).....		16,000
Steel field bolts (bearing).....		12,000

TENSION

Rolled steel	16,000
Cast steel	16,000

Working stress on bolts in tension, Sec. 64.

Working stress on concrete reinforcement bars, Sec. 114.

SHEAR

Steel web plates	10,000
Steel shop and power driven field rivets and pins.....	10,000
Steel field rivets (driven by hand).....	8,000
Steel field bolts	7,000
Cast steel	9,000
Cast iron	1,500

EXTREME FIBRE STRESS

Rolled steel beams, and riveted steel beams.....	16,000
Rolled steel pins, rivets, and bolts.....	20,000
Cast iron compression side	16,000
Cast iron tension side	2,500

(3). Concrete and Masonry.

COMPRESSION		Pounds per Square Inch
Grout, Portland cement, neat		5,000
Grout, Portland cement, neat between steel in foundation not over 1/2 inch		1,500
Concrete, Portland cement, 1; sand, 2; stone, 4.....		500
Concrete, Portland cement, 1; sand, 2 1/2; stone, 5.....		400
Concrete, Natural cement, 1; sand, 2; stone, 4.....		125
Concrete, Natural cement, 1; sand, 2 1/2; stone, 5.....		80
Brickwork in Portland cement mortar		250
Brickwork in Natural cement mortar.....		208
Brickwork in lime and Portland cement mortar.....		208
Brickwork in lime mortar		111
Hollow concrete blocks, see Section 50.		
Rubble stonework in Portland cement mortar.....		140
Rubble stonework in lime and cement mortar.....		100
Rubble stonework in lime mortar		70
Cut stone masonry, other than sandstone		600
Sandstone masonry		300
Granites, according to test	1,000 to	2,400
Gneiss		1,000
Limestones, according to test	700 to	2,300
Marbles, according to test	600 to	1,200
Sandstones, according to test	400 to	1,600
Slate		1,000

SHEAR

Shearing stress involving diagonal tension in Portland cement con- crete, in the proportions of 1-2-4	40
Direct shear (punching shear), in Portland cement concrete, in the proportions of 1-2-4	120

Working stresses on reinforced concrete, Secs. 114.

(4). Structural Timber.

The following stresses apply to seasoned timber to be kept under shelter in a dry location, and deflection not to increase with time. If the timber is to be used under other conditions, these stresses should be modified.

	BENDING		COMPRESSION	
	Extreme Fibre Stress	Maximum Longitudinal Shear	Perpendicular to the Grain	Parallel to the Grain, Columns with $\frac{l}{d}$ less than 10
Oak	1,400	120	400	1,000
Yellow Pine, Grade I.....	1,600	120	350	1,200
Yellow Pine, Grade II.....	1,200	85	325	900
Douglas Fir	1,500	100	300	1,100
Eastern Spruce	1,000	75	200	900
Western Hemlock	1,300	75	250	1,000
Norway Pine	1,000	75	250	800

l =unsupported length in inches.

d =diameter or least side in inches.

Where a moderate increase in deflection after first placement of the load is not objectionable, the compression and extreme fibre stresses here given may be increased 10 per cent. Stresses for timbers subject to vibration and impact, should not be thus increased.

Except for shear, the same stresses may be used for Douglas Fir of Grades I and II as for Yellow Pine of Grades I and II, provided the fir is selected in a manner to insure material of corresponding quality.

Section 58—Wind Pressure

(1). All buildings or parts of buildings in which the height is more than three times the minimum horizontal dimension shall be designed to resist a horizontal wind pressure in any direction of 20 lbs. for every square foot of exposed surface. Wind bracing shall be provided by making the connection joint between girders and columns sufficient for the vertical load as well as the bending due to side pressure; or diagonal bracing shall be placed between columns, proportioned to transfer the shear of the side pressure to the footings. All details shall be designed to carry the stresses in the main members.

(2). The overturning moment due to wind pressure shall not exceed 50 per cent. of the moment of stability of the structure, unless the structure is securely anchored to the foundation. The anchors shall be of sufficient strength to safely carry the excess overturning moment, without exceeding the allowable unit stresses given in this Code.

(3). When the stress due to the wind in any member or connection amounts to less than 50 per cent. of the total live and dead loads, it may be neglected. When the stress due to the wind exceeds 50 per cent. of the stress due to the combined live and dead loads, all these stresses shall be added together and the allowable unit stress for the total may be taken at 50 per cent. in excess of the values stated in Section 59. In no case shall this section be less than required if wind forces be neglected.

(4). In the design of circular chimneys, the area subject to wind pressure may be assumed as 60 per cent. of the diametral area.

Wind pressure on signs, Sec. 227, par. 6.

PART XI

CAST IRON CONSTRUCTION

Section 59 (a)—Cast Iron Columns

(1). The outside diameter or least side of cast iron columns shall be

not less than 5 inches, nor shall their unsupported length exceed sixty times their least radius of gyration.

(2). The finished thickness of metal in the shaft shall not be less than one-twelfth the outside diameter or the greatest lateral dimension of cross section, nor less than $\frac{3}{4}$ inch. The thickness of metal in flanges, lugs, seats, and brackets shall be not less than 1 inch.

(3). In all cast-iron columns not cast with one open side, at least three holes $\frac{3}{8}$ inch diameter shall be drilled 90 degrees apart near the middle of the shaft for the purpose of measuring the thickness of metal.

(4). Whenever the core of a cast iron column has shifted more than one-fourth the thickness of the shell, the strength shall be computed assuming the thickness of metal all around equal to the thinnest part, and the column shall be rejected if this computation shows the strength to be less than required by Section 57, par. 13.

(5). A cast iron column shall be rejected whenever blow-holes or other imperfections reduce the effective area of the cross-section more than 10 per cent.

(6). The ends of all cast iron columns shall be planed to a true surface perpendicular to the axis of the column. Successive column lengths shall be bolted together through end flanges with at least four bolts not less than $\frac{3}{4}$ inch in diameter. No shims shall be used between the flanges.

(7). If the core of a cast iron column below a joint is larger than the core of the column above, the core of the lower column shall be tapered up for a distance of not less than 6 inches, to the size of the core of the column above. In lieu of tapering the core, a steel or cast iron plate of sufficient thickness may be used between the flanges. The difference between the diameters or sides of any two successive column lengths shall not be greater than 2 inches.

(8). The connection of beams and girders to cast iron columns shall be effected by means of seats reinforced by brackets of sufficient depth and thickness to support the entire load, and by lugs to which the webs of the beams and girders shall be bolted. The projection of the seat beyond the face of the column shall in general be not greater than 4 inches.

(9). All holes in cast iron columns shall be drilled. Cored, or cored and reamed holes shall not be permitted. The diameter of holes shall not exceed that of the bolts by more than $\frac{1}{16}$ inch. The distance from the center of a hole to the edge of a flange or lug shall be not less than $1\frac{1}{2}$ inches.

(10). Cast iron columns shall not be used in any case where the load is sufficiently eccentric to reduce the unit compression to zero in the extreme fibre on one side of the axis of the column.

(11). Cast iron columns shall not be used in the structural frame of buildings, the height of which is greater than three times their width.

Cast iron columns shall not be painted or covered until after inspection by the Building Inspector.

Quality of cast iron, Sec. 54, par. 9.

Section 59B—Cast Iron Bases and Lintels

(1). Cast iron bases or shoes shall be planed on top. Bases which rest on still girders shall be planed top and bottom. The thickness of metal shall be not less than 1 inch. The inclination of the outer edge of the ribs with the horizontal shall be not less than 45 degrees. Whenever one side of the bed plate exceeds 3 feet in length a reinforcing flange at least 3 inches high shall be provided.

(2). Cast iron lintels shall be not less than $\frac{3}{4}$ inch in thickness, and shall not be used for spans exceeding 6 feet.

PART XII.

STEEL CONSTRUCTION

Section 60—Rolled Steel Columns

(1). No rolled steel column shall contain material whether in the body

of the column or used at lattice-bar or stay-plate of less thickness than $\frac{1}{4}$ inch.

(2). In steel columns built up of a web plate and angles and having an unsupported length greater than sixty times the least radius of gyration, the thickness of metal in the angles shall be not less than one-twelfth the width of the outstanding legs of the angles.

(3). The unsupported length of a rolled steel column shall not exceed one hundred and twenty times its least radius of gyration, nor forty times its least lateral dimension or diameter.

(4). The ends of all columns shall be faced to a plane surface at right angles to the axis of the columns. Wherever practicable, the connections between them shall be made with splice plates. When the sections of the columns to be spliced are such that splice plates cannot be used, a connection formed of plates and angles designed to properly distribute the stress may be used.

(5). Where any part of the section of a column projects beyond that of the column above, the difference shall be made up by filling plates secured to the column by the proper number of rivets.

(6). The pitch of rivets at the ends of built up columns shall not exceed four diameters of the rivets for a length equal to twice the greatest lateral dimension of the column.

Quality of structural steel, Sec. 54.

Section 61—Steel Girders and Beams

(1). The thickness of the web in built up girders shall be not less than one one-hundred and twentieth of the distance between the flange angles or stiffeners, nor less than $\frac{1}{4}$ inch.

(2). When the unsupported length (l) of the compression flange of a girder exceeds ten times its width (b) the unit stress in such flange shall not exceed $19,000 - 300l/b$, but in no case shall the unsupported length of the compression flange exceed forty times its width.

(3). Stiffeners shall be provided over supports and under concentrated loads; they shall be of sufficient strength as a column to carry the loads and shall be connected with a sufficient number of rivets to transmit the stress to the web plate.

If the unsupported depth of the web plate exceeds sixty times its thickness, intermediate stiffeners shall be provided. All stiffeners shall be in pairs with close bearing against the flange angles.

(4). When rolled steel beams are used in pairs to form girders they shall be connected together by bolts and iron or steel separators at intervals of not more than 5 feet.

All beams 12 inches and over in depth shall have at least two bolts to each separator.

(5). Beams supported by girders shall be riveted or securely bolted to the same.

Every beam, lintel, or girder supported by a wall, shall be properly anchored thereto and shall rest upon a steel or iron plate so designed as to properly distribute the load over the masonry.

Section 62—Framing and Connecting Structural Steel Work

(1). Steel girders, columns, beams, trusses, and other steel work of floors and roofs shall be well and firmly connected together, and to the walls.

(2). All beams framed into other beams, girders or columns shall be connected thereto either by angles or knees with sufficient rivets or bolts in both legs of each connecting angle to transmit the entire load coming on the connection to the supporting beam, girder or column; or a seat sufficiently strong to carry the full load with a side angle to hold the beam in place may be used.

Section 63—Steel Trusses

(1). Trusses shall be so designed that the stresses in each member can be calculated.

(2). All trusses shall be held rigidly in position by efficient systems of lateral and sway bracing, struts being spaced so that the maximum limit of length to least radius of gyration, established in this Code, is not exceeded.

(3). For tension members the actual net area only, after deducting rivet holes $\frac{1}{8}$ inch larger than the rivets, shall be considered as resisting the stress.

(4). Compression members in pin-connected trusses shall be so designed that the stresses shall not exceed 75 per cent. of the permissible working stress for columns. The heads of all eye-bars shall be made by upsetting or forging. No weld shall be allowed in the body of the bar. Steel eye-bars shall be annealed. Bars shall be straight before boring.

(5). All pin-holes shall be bored true and at right angles to the axis of the members, and must fit the pin within $\frac{1}{16}$ inch. Eye and screw ends shall be so proportioned that upon test to destruction fracture will take place in the body of the member. All pins shall be accurately turned.

Section 64—Riveting and Bolting

(1). All component parts of built up columns, girders, and trusses shall be riveted. All column connections in buildings over four stories in height shall be riveted. Riveting shall also be used in column splices, in web and flange splices of girders and trusses, and in all connections of beams and girders to columns.

Quality of rivet steel, Sec. 54.

(2). Where riveting is impracticable, turned bolts may be used provided the holes for same are punched and reamed to a template and the bolts are accurately fitted.

(3). All shop rivets, wherever practicable, shall be machine driven. The pitch of rivets shall never be less than three diameters of the rivet, nor more than six inches. In the direction of the stress it shall not exceed sixteen times the least thickness of the outside member. At right angles to the stress it shall not exceed thirty-two times the least thickness of the outside member.

(4). Rivets shall fill the holes completely; the heads shall be hemispherical and concentric with the axis of the rivet; the length between heads, shall not exceed five times the diameter.

(5). Where riveting is not required, connections may be made by bolts which shall be of wrought iron or mild steel with United States standard threads. The threads shall be full and clean; the nut shall be truly concentric with the bolt; and the thread shall be of sufficient length to allow the nut to be screwed up tightly.

(6). When bolts are used in tension, the working stresses shall be reduced to 7000 pounds per square inch of net area for steel, and to 5000 pounds per square inch for wrought iron, and the load shall be transmitted into the head or nut by washers distributing the pressure evenly over the entire surface of the same.

In the construction of exterior stairs, landings, platforms and balconies, no rivet shall be less than $\frac{3}{8}$ -inch diameter, and no bolt less than $\frac{1}{2}$ -inch diameter.

Quality of steel castings, Sec. 54.

Section 65—Protection of Structural Metal Against Corrosion

(1). All metal structural work shall be cleaned of all scale, dirt, and rust, and be given one coat of paint at the shop completely covering all exposed surfaces. After erection all such work shall be painted at least one additional coat of a shade different from the first coat. The first coat

of paint shall be made of pigments which shall be chemically inert after application, and shall be mixed with linseed or other drying oil. The amount of volatile matter shall be sufficient for easy spreading, and shall not injure the film of the paint. The paint must dry sufficiently hard within 24 hours so that it will not rub off or abrade easily. When the steel reaches the job all abraded or injured portions must be thoroughly recoated with the same material as the shop coat before the second coat is applied. The second coat of paint shall be such as will not act as a solvent of the first coat, and shall be mixed with a pigment which shall be inert after application, and the vehicle shall be one that will not saponify under the action of cement mortar.

(2). Surfaces of riveted work which come in contact with each other, shall be painted with two coats of paint before assembling.

(3). All iron or steel used in damp locations or under water shall be embedded in Portland cement concrete. No paint shall be applied to the steel surfaces which are to be encased in concrete.

(4). Any structural steel work which may be so placed as to be inaccessible for inspection after erection, shall be thoroughly cleaned of all rust and encased in Portland cement concrete before it is rendered inaccessible.

Protection of wall columns, Sec. 101, par. 1.

ORDINARY TIMBER CONSTRUCTION

Section 66—Wooden Beams or Joists

amended

(1). Every wooden beam in any party or fire wall shall be separated from any other beam in the wall by at least 6 inches of solid masonry. Such separation may be obtained by staggering the beams, corbeling, or by use of approved steel hangers properly anchored in the wall, and arranged to make the beams self-releasing. No wall shall be corbeled more than 2 inches for this purpose. If the beam ends are opposite each other in the wall the separation shall be not less than 8 inches.

(2). No wooden floor or roof beam used in any building within the fire limits shall be less than 2x8.

(3). The thickness of wooden beams shall be not less than 2x6 inches in any building where the floor load is greater than 60 pounds per square foot.

(4). Trimmer and header beams over 4 feet in length shall be hung in approved metal stirrups or hangers.

(5). Every wooden beam, except header and tail beams, shall have bearings of at least 4 inches.

(6). The ends of all wooden floor and roof beams, which rest on walls, shall be cut to a bevel of 3 inches in their depth.

(7). Neither end of a floor or roof beam shall be supported on stud partitions, except in frame buildings.

(8). All wooden floor and roof beams shall be properly braced with cross bridging. The distance between bridging or between bridging and bearing shall not exceed 8 feet. So far as possible knots or other imperfections shall be excluded from the bottom and top quarters of timber beams.

Quality of structural timber, Sec. 57.

Timber stresses, Sec. 57, par. 4.

Hollow Tile. No wood lintels in any opening.

Section 67—Wooden Beams Separated from Masonry Chimneys

(1). No wooden beams or joists shall be placed within 2 inches of

the outside face of a chimney or flue, whether the same be for smoke, air or any other purpose.

(2). No woodwork shall be within 4 inches of the back face of the wall of any fireplace.

(3). For smoke flues of boilers and furnaces where the brick work is required to be more than 8 inches in thickness, the header beams shall be not less than 4 inches from the outside of the brickwork.

(4). All spaces between the chimney and the wooden beams shall be filled with mineral wool, loose cinders, gypsum block, or other porous incombustible material.

(5). The header beam, carrying the tail beams of a floor, and supporting the trimmer arch in front of a fireplace, shall be not less than 20 inches from the chimney breast.

(6). No wooden furring or studding shall be placed against any chimney; the plastering shall be directly on the masonry, or on metal lathing.

Section 68—Anchors for Wooden Beams and Girders

(1). Each tier of beams shall be anchored to the walls with steel anchors at intervals of not more than 6 feet.

(2). Where the beams are supported by girders, the girders shall be anchored to the walls and fastened to each other by steel straps.

(3). The ends of wood beams resting upon girders shall be abutted together, end to end, or lapped, spiked, and strapped by steel straps of the same size and distance apart, and in the same manner as the wall anchors.

(4). Each tier of beams running parallel to enclosing walls shall have approved 4-inch anchor strips dovetailed into the beams diagonally, crossing at least four beams.

(5). Every pier shall be well anchored to at least three beams of each story, with steel anchors.

Fire-stopping of wooden construction, Sec. 87.

Section 69—Timber Columns, Posts and Trusses

(1). All timber columns and posts shall be squared at the ends perpendicular to their axes, and iron or steel cap plates and base plates shall be provided.

(2). Where the cap plate of a timber column or post supports a wooden girder any column above shall bear directly on the metal cap and shall not rest on the girder. Steel cheek plates shall be bolted to the girders and post, when required for safety.

(3). All bolts used in connection with timber work shall be provided with washers of such proportions as will reduce the compression on the wood at the face of the washer to that allowed in Section 57, paragraph 4, supposing the bolt to be stressed to its limit.

Timber column stresses, Sec. 57, par. 4.

PART XIII

ROOFS AND ROOF STRUCTURES

Section 70—Roof Coverings

(1). All buildings except as given below shall have roof coverings of approved standard quality, such as brick, concrete, tile, or slate; or highest grade of tin roofing, or of asbestos shingles, or of built-up roofing felt with gravel or slag surface, or of built-up asbestos roofing; or other roofings of like grade which would rank as Class A or B under the test specifications of the National Board of Fire Underwriters.

Exceptions: Buildings outside of Fire District.

(2). The quality of roofing for all buildings exempted in paragraph 1, shall be as therein specified or may be of a grade not lower than that

indicated in the definition of approved fire-resisting roofing, Section 162, paragraph 8; or of a grade which would rank not lower than Class F, under the test specifications of the National Board of Fire Underwriters.

(3). A layer of deadening felt at least 1-16 inch thick shall be placed between metal roofing and the supporting woodwork.

(4). The wooden planking and sheathing of roofs shall not in any case be extended across side or party walls.

(5). Any roof having a pitch over 60 degrees, placed on any building over 40 feet high, except towers or church spires as specified in Section 34, shall be constructed of iron or steel frames filled with fireproof material not less than 3½ inches thick, and shall be covered with approved roofing.

(6). All flashings shall be of metal properly incorporated with the roofing material. Copper flashings are recommended.

(7). The top and sides of dormer windows shall be protected the same as the roof.

(8). This section shall not be construed to prohibit the repairing of a wooden shingle roof, provided the building is not increased in height, but the renewal of such roof is forbidden. No existing wooden shingle roof, if damaged more than 10 per cent., shall be repaired with other than approved roofing.

Test of approved roofing, Sec. 162, par. 8.

Roof loads, Sec. 37.

Fireproof roof construction, Sec. 100, par. 7.

Section 70—Roof Leaders

(1). All buildings shall be provided with proper metal leaders, which shall be connected to the sewer. Where there are no sewers such leaders shall be connected by pipes below the surface to the street gutter or a cesspool. Detached dwellings, or other one-story buildings, may be exempt from the requirements of this section at the discretion of the Building Inspector.

Section 72—Scuttles on Roofs

(1). Upon the roof of every building more than 15 feet high, which is not required to have stairs and bulkhead leading thereto, there shall be a scuttle with stairs or substantial stationary step ladder leading to same, which shall be easily accessible at all times to all occupants without the use of keys. All non-fireproof scuttle shall be covered on the top and edges with sheet metal or other approved fireproof material. The roof opening shall be at least 2 feet by 3 feet in size.

Section 73—Pent Houses and Bulkheads

(1). All inclosures upon roofs for tanks, elevators or elevator machinery, and all pent houses and bulkheads upon non-fireproof buildings shall be of fireproof construction, or may be built of wooden studs filled with brick or other incombustible material and completely covered with metal or other approved incombustible material; and all windows, doors, and trim shall be of metal, or metal covered, and be glazed with wired glass where glass is used.

(2). All such structures upon fireproof buildings shall be of fireproof construction, including floors, and in all cases the outside surface shall be covered with approved incombustible weatherproof material, including all surfaces and the edges of doors and jambs.

(3). Bulkheads or pent houses when used only for the purpose of enclosing staircases to roofs, elevator machinery, water tanks, ventilating apparatus, exhaust chambers, or other machinery, need not be considered in determining the height of the building.

Pent houses when occupied for purposes other than hereinbefore described, shall not exceed 12 feet in height, and shall not occupy more

than 75 per cent. of the area of the roof, including all other bulkheads or pent houses; and excepting that no pent house shall be occupied or used for purposes other than for the exclusive use of the janitor.

(4). No staging, stand, sign, or other structure shall be constructed upon the roof of any building without first obtaining the approval of the Building Inspector.

Roof loads, Sec. 37.

Roofs on mill construction, Sec. 100.

Section 74—Tanks

(1). Tanks of more than 500 gallons capacity placed within any building, or on or above the roof of any building, shall be supported by steel or masonry of sufficient strength to carry the same safely. Beams shall rest at both ends on steel girders, iron or steel columns, or walls or piers of masonry. The supporting I beams shall either have the ends built into masonry work, or shall be securely framed together in a manner to prevent possibility of overturning or buckling due to oscillation of the tank in a wind storm.

(2). In or near the bottom of each tank there shall be a pipe or outlet not less than 4 inches in diameter, fitted with a suitable gate valve, to permit ready drainage of the tank in case of necessity.

(3). Wooden covers of tanks on roofs shall be covered with metal. Hoops of wooden tanks shall be of metal round in section.

Tanks for sprinkler system, Sec. 182, pars. 8 and 9.

(4). Tanks having a capacity exceeding 1000 gallons and placed on or within non-fireproof buildings, shall have the supporting steel framework thoroughly encased in fireproof material.

Section 75—Cornices and Gutters

amended
(1). On all buildings or structures within the fire limits the exterior cornices, inclusive of those on show windows and gutters, shall be of incombustible material. All cornices not built as a part of the walls, shall be secured to the walls with metal framing or anchors.

(2). Exterior wooden cornices or gutters on buildings or structures within the fire limits, which are unsafe or are damaged to the extent of one-half, shall be taken down; any replacement of same shall be made with incombustible materials. If damaged less than 10%, they may be repaired with the same material as originally constructed.

(3). Outside of fire limits where buildings having masonry walls are placed nearer than 3 feet to a side or rear lot line, or 5 feet to another building, the cornices and overhanging eaves on the side or rear walls shall be of, or covered with, incombustible material. When such buildings are erected in rows, combustible cornices on the front shall be fire-stopped with incombustible material between each building.

Section 76—Skylights

(1). All skylights shall have metal frames and sash, and the frames and parts thereof shall be rivited or otherwise securely fastened in addition to soldering.

(2). Except as herein provided, all skylights shall be glazed with wired glass, or heavy plain glass may be used, if protected above by galvanized wire screens. If plain glass be used in skylights on buildings of a public character over any passageway or room of public resort, wire screens shall be placed beneath the skylight as well as above.

(3). No wired glass shall be placed in a skylight at the top of enclosures for elevators, stairways, dumbwaiters, or vent and light shafts; all such skylights shall be glazed with thin glass and shall be protected by

galvanized wire screens. The mesh of such screens shall not exceed 1 inch, and the wire shall be of a size not less than No. 12 gauge. All screens shall have substantial metal supports and shall be placed at least 6 inches above skylights and project 6 inches beyond edges of skylights.

(4). When metal louvres are used for ventilating purposes, over shafts or in connection with skylights, the louvres or slats shall be riveted to the metal frame.

(5). Instead of a skylight over a shaft, a window of equivalent area may be placed in the side of the shaft above the roof, which is furthest removed from a property line. The window shall have incombustible frame and sash, and be glazed with thin glass.

(6). Except windows in the side of shafts above the roof, wired glass only shall be used in skylights which are vertical or inclined at an angle of over 45 degrees, when subject to an exposure which would require wall openings to be protected by fire windows or fire doors.

Area of shaft skylights, Sec. 80, par. 7.

Theatre stage ventilators, Sec. 214.

Section 77—Protection of Skylights and Roof

(1). Where walls are carried up above the roofs of adjoining buildings, proper means shall be provided and used by the person erecting the walls for the protection of the skylights and roofs of such adjoining buildings.

(2). Should the owner of such adjoining building refuse permission to have his roofs and skylights protected, such refusal shall be reported in writing to the Building Inspector, and it shall then be the duty of the owner refusing such permission to make his skylight and roofs safe at his own expense. Such refusal by said owner shall relieve the owner or person erecting the building from any responsibility for damage done to persons or property on or within the premises affected.

PART XIV

FIRE DOORS, FIRE WINDOWS AND FIRE SHUTTERS *amended*

Section 78—Protection of Exterior Wall Openings

(1). Every building ~~within the fire limits~~, except churches and dwellings, shall have approved fire doors, or fire windows on every exterior opening above the first story, when fronting on a street or driveway less than 50 feet wide, or where another building or portion of the same building is within 50 feet of such opening; also all openings in the side and rear walls of the first story, except show windows, when less than 50 feet from another building. The walls of a building in the same plane or parallel planes and facing in the same direction as that in which the opening is situated, shall not be considered as coming within the intent of this rule.

(2). All openings in a side wall above and facing on the roof of an adjoining building of other than fireproof construction, shall be protected by fire doors or fire windows to a height of 50 feet above the roof measured in a vertical line. If the adjoining building has a fireproof roof, all openings in the said side wall shall be protected from the level of the adjoining roof to a height of 50 feet measured in a straight line from the adjacent edge of the nearest skylight or other opening in the adjoining roof, to the top of the opening in the wall.

(3). All openings in a side wall above and facing on the roof of a building or other than fireproof construction which is separated from the side wall by a horizontal distance less than 50 feet, shall be protected by fire doors or fire windows from the roof level of the exposing building to a height of 50 feet measured from the top of the adjacent parapet wall to the top of the opening in the side wall or 50 feet from the adjacent edge

of the nearest skylight or other opening in the roof of the exposing building, if the roof be of fireproof construction.

(4). All exterior wall openings more than 75 feet above the curb in all buildings, shall be protected by fire doors or fire windows.

(5). In busines buildings over four stories or 55 feet in height, the windows which are not fire windows, shall have a distance of at least 3 feet between the top of a window sill, and the bottom of the lintel of a window directly beneath. No such window shall be arranged to open within 1 foot of the ceiling surface, but the wall construction between the window opening and the ceiling, may, if desired, be replaced by a fire window in fixed sash and frame.

~~Protection of exterior openinges in mill construction, Sec. 94.
Specifications for test of fire doors, windows and shutters, Sec. 162.~~

(6). Approved fire shutters may be substituted in place of the fire windows required in paragraphs 1, 2 and 3. In such cases at least one row in every three vertical rows of shutters shall be arranged to be readily opened from the outside, and a distinguishing mark satisfactory to the Chief of the Fire Department shall be provided on these shutters.

(7). Occupants of buildings shall close all fire doors, shutters, and windows at the close of business each day.

Section 79—Protection of Interior Wall Openings

(1). All openings in interior walls shall be protected by fire doors and fire windows where required by this Code, and wherever considered necessary by the Building Inspector.

(2). In buildings of all classes, all openings into halls or adjoining rooms from rooms in which paints, oils, varnishes, spirituous liquors, or drugs or other highly inflammable liquids or materials are stored for purpose of sale or otherwise; or in which manufacturing processes, or business operations are conducted which are generally recognized as hazardous as regards fire, shall be protected by self-closing fire doors, or fire windows.

This paragraph shall apply to existing as well as new buildings.

Openings in fire walls, Sec. 94.

Openings in fire exist partitions, Sec. 43.

Openings in shafts, Sec. 80.

Public hallways in tenements, Secs. 236.

PART XV

PROTECTION OF VERTICAL OPENINGS

Section 80—Enclosures for Stairways, Elevators, Escalators and Other Shafts in Fireproof Buildings

(1). All interior shafts containing stairways required to be enclosed by Section 79 and except in dwellings, all shafts exceeding 6 square feet in area containing elevators, escalators, hoistways, chutes, ventilating ducts, or used for any other purpose, shall be continuously enclosed with fireproof walls or partitions built as follows:

Definition of elevator, Sec. 226, par. 1.

(a) Brick or plain solid concrete not less than 8 inches in thickness for the uppermost 30 feet, increasing 4 inches in thickness for each lower section of 30 feet or part thereof or 8 inches in thickness for the entire height when wholly supported at vertical intervals not exceeding 30 feet.

(b) Reinforced stone or gravel concrete not less than 6 inches in thickness for the uppermost 30 feet, increasing 2 inches in thickness for each lower section of 30 feet or part thereof; or 5 inches in thickness for the entire height when supported at vertical intervals not exceeding 20 feet and braced where necessary with lateral supports or suitable steel up-rights.

(c) Reinforced cinder concrete not less than 5 inches in thickness for the entire height when supported at vertical intervals not exceeding 15 feet, and braced where necessary with lateral supports or suitable steel uprights.

(d) Semi-porous or porous terra cotta tile, or solid gypsum blocks not less than 6 inches in thickness for the entire height when supported at vertical intervals not exceeding 20 feet, and securely anchored by steel reinforcement encased in the construction.

Terra cotta tile shall have not less than two cells in its thickness, with shells and webs not less than $\frac{5}{8}$ inch thick.

All openings in such partitions shall have substantial steel framing, the vertical members of which shall be securely attached to the floor construction above and below.

(e) Any material and form of construction which may be approved by the Building Inspector after a fire and water test as required in Section 162, paragraph 4, but no such partition shall be less than 5 inches thick.

When stair hallway shall be enclosed same as stairway, Sec. 104, par. 7.

Construction of stairs, Sec. 41.

(2). Enclosure partitions supporting floor loads shall be of materials and thickness required for bearing walls.

(3) Portland cement mortar shall be used for all masonry work in shaft construction, except that gypsum mortar may be used to set gypsum blocks.

Cement mortar, Sec. 5, par. 14.

Gypsum mortar, Sec. 49.

(4). Concrete walls or partitions shall conform to the requirements of the sections on concrete construction.

(5). The bottom of such enclosure, and the top when not extended through the roof, shall be of fireproof material not less than 4 inches in thickness.

(6). When such shafts extend to the top story, they shall continue through the roof, and shall project not less than 6 inches above the roof surface. All such shafts shall be enclosed above the roof by at least 5 inches of brick, or stone concrete.

(7). Every shaft which extends above the roof shall have a skylight, covering at least three-fourths of the area of the shaft.

Construction of skylights, Sec. 76.

(8). All steel used to support shaft enclosures, as required in this section, shall so far as possible, be embedded in the fireproofing material, and shall be protected on all sides, in the manner required for steel in fireproof buildings. See Section 161.

(9). When the compartment that contains the machinery for operating an elevator communicates with an elevator shaft, it shall be enclosed with fireproof partitions as required for the shaft.

(10). A shaft shall not contain more than two elevators. The separating partitions shall be not less than 2 inches thick.

(11). A stairway and elevator shall not be permitted within the same shaft enclosure.

(12). All door openings into such shafts shall be protected by fire doors and shall be self-closing except for elevator doors. No glass shall be permitted in such doors, except when doors in elevator shafts open upon an enclosed hallway a wired glass panel not exceeding 2 square feet may be provided in each door. Care shall be exercised to insure that all such doors shall fit the opening as closely as practicable.

In factories and warehouses where elevator shafts open directly into a work or storage room, no wired glass shall be permitted in the doors.

The size of such door openings shall not exceed 5 feet 4 inches by 7 feet 6 inches.

(13). Windows shall not be permitted in shaft enclosures, except those opening to the outside air, and which are at least 3 feet distant from any other opening; all such windows shall be stationary or automatic closing fire windows.

(14). Where an elevator, escalator, or stairway as required in paragraph, connects two floors only in a building, it shall be enclosed in the same manner as for a continuous shaft, except that it may be left open in one story if enclosed in the other. Such elevator or escalator shall not be included in calculations for required means of exit, and no such stairway shall be considered as an exit from more than one floor.

Fire doors and windows, Sec. 26.

Construction of elevators, Sec. 226.

Section 81—Enclosures for Dumbwaiters and Other Shafts Not Exceeding 6 Square Feet in Area in Fireproof Buildings

(1). All dumbwaiter and other shafts or chutes not exceeding 6 square feet in area, excepting dumbwaiter shafts which do not extend more than one story above the cellar or basement floor in dwellings, shall be continuously enclosed by partitions of brick, terra cotta (concrete, metal lath and cement plaster, gypsum blocks, or other approved fireproof material not less than 3 inches thick, which may meet the test specified in Section 162, paragraph 4. Such walls or partitions shall rest upon incombustible foundations, and shall be braced between floors with approved incombustible framing. Gypsum blocks may be set in gypsum mortar; all other blocks shall be set in Portland cement mortar.

(2). When dumbwaiter or other small shafts are constructed of blocks or tile, all corner blocks or tile shall be held by metal angle clips or anchors, or be secured by other approved means.

(3). Where a dumbwaiter shaft extends into the cellar or basement of a building, it shall be enclosed in that story with walls of masonry not less than 5 inches thick.

(4). The bottom of such shaft shall be of fireproof material, and where such shaft does not extend through the roof, the top of the shaft shall be of fireproof material of at least the thickness of the enclosing partitions.

(5). When such a shaft penetrates the roof it shall project at least 6 inches above the roof, and shall be covered with fireproof material and have a skylight covering at least three-fourths the area of the shaft.

Construction of skylights, Sec. 76.

(6). All openings in dumbwaiter shafts shall be provided with approved self-closing fire doors.

(7). No woodwork other than the guides and car shall be permitted in the construction of any such shaft.

Construction of vent flues, Sec. 172.

Section 82—Light and Vent Shafts

(1). The walls of all light or vent shafts, whether exterior or interior, shall extend not less than 3 feet above the level of the roof and be coped.

(2). In all buildings other than private dwellings and frame buildings, all windows opening into light and vent shafts shall be protected by fire windows.

Section 83—Enclosures for Stairway, Elevator and Other Shafts in Non-Fireproof Buildings

(1). In non-fireproof buildings of ordinary construction, all shafts defined in Sections 80, 81 and 82, shall be constructed as specified in those sections, except as herein provided, and except that the enclosing walls or partitions may be of semi-porous or porous two cell terra cotta, or of solid gypsum blocks, not less than 5 inches in thickness; or 4 inches of reinforced concrete. The thickness of new material permitted under tests as specified in Section 162, shall be not less than 4 inches. Such partitions shall be supported by steel structural frame-work at intervals not exceeding 20 feet. In all respects the reinforcement, bracing, and protection of steel-work shall conform to the requirements of Section 101.

Any woodwork other than guides and car, exposed on the inside of the shaft, shall be covered with metal, or metal lath and $\frac{3}{4}$ inch of cement or cement-tempered plaster, or their equivalent.

(2). Dumbwaiter and other small shafts shall be constructed the same as required in Section 81, except as provided in paragraph 1.

(3). Every shaft in a non-fireproof building that extends to the top floor shall continue through the roof and at least 3 feet above it, with walls of same thickness as required in the upper story. In all other respects, shafts in non-fireproof buildings of ordinary construction, shall conform to the requirements of Sections 80 and 81.

(4). When such partitions rest upon timber construction, they shall be fire-stopped with incombustible material the full depth of the floor beams at each floor level in the manner specified in Section 87, paragraphs 2 and 3. The fire-stopping shall be placed to form a complete cut-off between the interior of the building and the shaft.

Enclosure for stairway and elevator shafts in mill construction buildings, Sec. 98.

When stair hallway shall be enclosed same as stairway, Sec. 104, par. 7.

Section 84—Shafts and Hoistways in Existing Buildings

(1). All existing buildings over two stories high, which are used above the first story for business purposes or for public assemblage, or for any purpose whatever, if over three stories high, except dwellings, shall have all existing stairway, elevator, and hoistway shafts separately and continuously enclosed by incombustible partitions. Such partitions or enclosing walls, shall be constructed as required in Sections 80 and 81; or in non-fireproof buildings, a 3-inch terra cotta, concrete, or gypsum block or tile; or a 2-inch solid metal lath and cement plaster partition; or a 2x4 inch wooden stud partition with 4-inch dimension at right angles to the wall and covered on each side with metal lath and not less than $\frac{3}{4}$ -inch cement plaster, or by $\frac{1}{2}$ -inch fibre plaster board with filled joints and covered with sheet metal, may be substituted in buildings not exceeding 75 feet in height. Self-closing fire doors shall be used at all openings.

(2). If in the opinion of the Building Inspector it is necessary to preserve an open elevator or hoistway in an existing building; or if in his judgment the conditions are such that the requirement to enclose would be a substantial injustice to the owner or occupant, the above requirement may be waived; but the floor openings through which the elevator passes shall be equipped with automatically closing trap doors not less than 1 $\frac{1}{2}$ inches thick, made of two thicknesses of matched boards, covered on the under side with tin; the trap doors when closed shall extend beyond the openings on all sides. Such trap doors shall be protected by a substantial guard or gate, which shall be kept closed at all times except when in actual use.

PART XVI

MISCELLANEOUS CONSTRUCTION REQUIREMENTS

Section 85—Light and Ventilation

(1). In all buildings every sleeping room shall be provided with a window or windows opening directly upon a street, yard or court, except that in dwellings a window shall not be required in a sleeping room which is lighted and ventilated by a skylight; or which is connected by an archway or opening containing not less than 50 square feet in the clear, with a room other than a sleeping room provided with at least two windows of not less than 15 square feet area each between stop beads, and opening directly on a street or yard.

The windows of every sleeping room shall have an area of not less than 12 square feet between stop beads, and the sash shall be arranged to open to the extent of one-half their area. The glass area of skylights for ventilating sleeping rooms shall be not less than 9 square feet, and the skylight shall be provided with movable ventilating louvres or sash.

(2). In every building, other than a detached dwelling and a dwelling occupied by not more than one family, every sleeping room shall be, for at least two-thirds of its area, not less than 8 feet 6 inches high from the finished floor to the finished ceiling, and shall be not less than 7 feet in width at its narrowest point, and have an area of not less than 70 square feet, except that in hotels, the area shall be not less than 80 square feet.

(3). No sleeping room shall be placed in any story the ceiling of which is less than 4 feet 6 inches above the curb or adjacent ground level.

Limits of lot area occupied, Sec. 10.

Section 86—Floor Lights

(1). Floor lights shall have metal or reinforced concrete frames, and shall be of the same strength as the floors in which they are placed. The glass in floor lights shall be not less than $\frac{3}{4}$ inch in thickness, and if any glass measures more than 16 square inches, there shall be a wire mesh, either in the glass or under it.

Section 87—Fire-Stopping

(1). **Furred Walls.** For all walls furred with wood the masonry between the ends of wooden beams shall project the thickness of the furring beyond the inner face of the wall for the full depth of the beams; or a course of masonry above and below the beams, shall project the full thickness of the furring beyond the face of the wall. In cases where floor beams are parallel to a wall furred with wood, there shall be a space of not less than $2\frac{1}{2}$ inches between such wall and the nearest beam. This space shall be filled in solidly with brickwork, or concrete for the full depth of the floor beams.

(2). **Studded-off Spaces.** Where walls are studded-off, the space between the inside face of the wall and the studding at the floor level shall be fire-stopped with brickwork or other approved fireproof material. The beams directly over the studded-off space shall be deadened with not less than 6 inches of fireproof material, which shall be laid on boards cut in between the beams. The under side of such beams shall be protected by a covering of metal lath, or plaster board, and plastered to a total thickness of $\frac{3}{4}$ -inch.

(3). **Partitions.** Where stud partitions rest directly over each other, and cross the wooden floor beams at any angle, they shall run down between the floor beams and rest on the top plate of the partition below, and

shall have the studding filled in solid between the uprights the depth of the floor beams and at least 4 inches above each floor level with brickwork or other approved incombustible materials. Such stops shall be arranged to entirely separate the spaces between floor beams and those between partition studs in a manner to effectually cut off draft openings from story to story.

When sliding doors are pocketed in partitions, care shall be exercised to insure that such pockets be completely fire-stopped at top and bottom.

(4). **Wainscoting.** The surface of the walls or partitions behind wainscoting shall be plastered flush with the grounds and down to the floor line.

(5). **Stairs.** The space between stair carriages shall be fire-stopped at least once in the middle portion of each run.

(6). No fire-stops shall be covered or in any manner concealed from view until approved in writing by the Building Inspector, who shall inspect the same within 48 hours after receiving written notice. Sundays and legal holidays excepted.

(7). **Pipe, Shafts and Belts.** All exposed pipes or power shafting through any floor or wall shall have the surrounding air space closed off at the ceiling and the floor line; also on each side of the wall by close fitting metal caps. In fireproof construction it is preferable to have the pipes or shafts fit neat in the floor or wall.

All belt drives through floors shall be continuously enclosed by steel framework covered with metal lath and cement plaster, or other approved incombustible material. Where possible all such belts shall be placed in a special shaft as required in "Mill Construction," Section 98, paragraph 3.

(8). **Ducts and Chases.** Ducts, chases, or shafts for pipes, wires, cables and for similar purposes, shall be constructed as required in Section 84, or shall be fire-stopped at each floor.

Fire-stops around chimneys, Sec. 166, par. 6.

Fire-stops in frame buildings, Sec. 177, par. 6.

Section 88—Requirements in Non-Fireproof Buildings Used for Business and Residence.

(1). All ordinary construction non-fireproof buildings of Classes C and D over two stories or 35 feet high, where the lower stories or portions thereof are used for business, and the stories above for residence purposes, shall have all partitions and ceilings separating the business portions from the residence portions, covered with metal lath or ½-inch fibre plaster board and plastered with cement or cement-tempered plaster to a total thickness of ¾ inch; or plaster board may be covered with sheet metal. Other equivalent fireproofing may be used. There shall be no windows in such partitions, and all other openings shall be protected by fire doors.

Stairway, elevator and other shafts in such buildings, shall be constructed in conformity with requirements of Section 83.

Fire-stops shall also be provided at the line of the ceilings to completely cut off all communication to floors above through hollow stud partitions or side walls, as required by Section 87, paragraphs 1 and 2.

Classification of buildings, Sec. 8.

PART XVII

CELLARS, VAULTS, AREAWAYS AND PROJECTING STRUCTURES

Section 89—Requirements for Cellars

(1). **Drainage.** Before the walls of buildings are carried above the first tier of beams, the cellar shall be connected with the sewer and provided with a properly screened intake. Should there be no sewer in the street,

or if the cellar is below water or sewer level, provision shall be made to prevent water accumulating in the cellar, to the injury of the foundation.

(2). **Floors.** Any floor laid on the ground shall be made of concrete not less than 4 inches thick. Such floors and the exterior walls shall be waterproof when required by the Building Inspector.

(3). **Partitions.** Except in dwellings, and in frame buildings outside the fire limits, all partitions in cellars, excepting partitions enclosing fuel bins, shall be of fireproof construction.

(4). **Columns and Piers.** All columns or piers used to support the floor or partitions above, shall be of metal or masonry. If metal columns be used in non-fireproof buildings they shall be protected as required in Section 141.

(5). **Ceilings.** All non-fireproof buildings over one story high which are not required to have the first floor of fireproof construction, except dwellings, shall have the ceiling over the cellar or basement which is nearest to grade level entirely covered with metal lath and at least $\frac{3}{4}$ inch of cement or cement-tempered plaster, or shall be covered with strong fibre plaster boards not less than $\frac{1}{2}$ inch thick well nailed, and coated with at least $\frac{1}{4}$ inch of cement or cement-tempered plaster or with sheet metal.

Ceilings in cellars of frame buildings, Sec. 178.

(6). **Shafts.** Stairway and other shafts which communicate with cellars, shall be enclosed as specified for such shafts in Sections 80 and 81 inclusive.

Section 90—Vaults Under Sidewalks

(1). Where a vault is built under the sidewalk a wall shall be constructed to retain the adjacent banks.

(2). The roofs of all vaults shall be of approved incombustible material. Glass, when used in the roofs of the vaults, shall measure not more than 16 square inches in one light.

(3). All vaults shall be thoroughly ventilated.

amended Section 91—Areaways and Projections Beyond the Building Line

(1). Areaways or openings covered with iron gratings or with iron doors not more than 3 feet in width, with rough surface set flush with sidewalk, may project not more than 4 feet beyond the building line. If gratings be used, they shall have a wire screen of not more than $\frac{1}{2}$ inch mesh securely attached to the under side.

(2). No open areaways, railings, steps, or any portion of a building or structure shall project beyond the building line at any point less than 10 feet above the curb level.

(3). Water tables, belt courses, sills, bases, columns, pilasters, capitals or other decorative features which are part of the construction shall not project more than 6 inches beyond the building line. Such projection may be erected only upon a revokable permit issued by the Building Inspector when in his opinion such projection will not in any manner obstruct the free use of the sidewalk for travel.

(4). No bay, oriel or show window shall project beyond the building line at any point. When erected within the fire limits they shall be constructed of incombustible material, except that on a dwelling such window may be permitted of wooden framework covered with incombustible material, provided it does not extend more than 3 feet above the second-story floor. Cornices of show windows more than 10 feet above curb level may project not more than 18 inches beyond building line.

(5). Alteration or repairs of areaways, steps, store fronts, or projecting or show windows shall be subject to the requirements of this section.

PART XVIII

"MILL" CONSTRUCTION

Section 92—Definition

(1) "Mill" Construction (also called "Slow-burning Construction") is a term applied to buildings having masonry walls and heavy timber interior construction with no concealed spaces. Such buildings are usually occupied for factory purposes, and should always be protected by a system of automatic sprinklers.

Limits of height and area, Secs. 34 and 10.

Section 93—Foundations and Walls

(1). Foundations shall conform to the requirements of Sections 16 and 19.

(2). Outside walls shall be of brick or concrete and shall conform as to construction and thickness to the requirement of Section 24.

(3). Fire and party walls shall be of brick or concrete, and the thickness and construction shall conform to the requirements of Sections 24 and 26. Parapets shall project to cut-off overhang of roof if any, and special parapets shall be provided where monitors or roof lanterns are near fire walls.

Section 94—Protection of Wall Openings

(1). Openings in exterior walls shall be protected with approved fire doors or shutters, or if the exposure is not too great, approved wired glass windows may be used. The openings to be protected shall be as specified in this section and Sections 78 and 79.

(2). Walls above window and door openings shall be self-supporting without the use of lintels. Sills shall be brick, concrete, or terra cotta.

(3). All openings such as shafts and belt holes, etc., shall be avoided where possible, but where they are necessary they shall be protected by approved fire shutters.

(4). All windows and other openings in side walls of buildings for a distance of at least 10 feet each side of a fire wall, shall be protected as called for in paragraph 1.

(5). Where main sections are separated by fire walls and adjoin so as to form an angle, all window or other openings in side walls for a distance of not less than 30 feet from the angle, shall be protected as called for in Sec. 18. Where minor sections, such as boiler or engine houses, adjoin, the above rule need apply only to main sections of buildings. Where there are no openings in one section within 10 feet of the fire wall, the other section need not be protected.

(6). When buildings of different heights adjoin, all windows of the higher section above the roof of the lower section, as well as all windows within 10 feet of the fire wall on each section, shall be protected as called for in Sec. 78.

(7). Openings in fire walls shall be protected as required in Section 94.

Section 95—Columns and Girders or Floor Timbers

(1). Columns, if of timber, shall be not less than 8 inches in smallest cross sectional dimensions and all corners shall be rounded or chamfered.

(2). Wooden columns shall be superimposed throughout all stories on iron or steel post caps with brackets.

(3). Iron or steel columns or girders may be used if protected as required in Section 132.

(4). Wooden girders or floor timbers shall be suitable for the load carried, but in no case less than 6 inches either dimension, and shall rest on iron plates on wall ledges and where entering walls shall be self-releas-

ing. Walls may be corbeled out to support floor timbers where necessary. The corbeling shall not exceed 2 inches.

(5). So far as possible, girders or floor timbers shall be single stick.

(6). Where wooden beams enter walls on opposite sides, there shall be at least 12 inches of masonry between ends of beams, and in no case shall they enter more than one-quarter the thickness of the wall.

(7). Width of floor bays shall be between 6 and 11 feet.

Allowable timber stresses, Sec. 37, par. 4.

Section 96—Floors

(1). Floors shall be not less than 3 inches ($2\frac{3}{4}$ inches dressed) splined or tongued and grooved plank covered with 1-inch ($\frac{3}{4}$ -inch dressed) flooring laid crossway or diagonally. Top flooring shall not extend closer than $\frac{1}{2}$ inch to walls so as to allow for swelling in case floor becomes wet. This space shall be covered by a moulding so arranged that it will not obstruct movement of the flooring.

(2). Waterproofing shall be laid between the planking and the flooring in such manner as to make a thoroughly waterproof floor to a height of at least 3 inches above floor level. When there are no scuppers, the elevator or stairwells may be used as drains for the floors, in which case the waterproofing material need not be flashed up at these points.

Drainage of floors, Sec. 89, par. 1.

(3). All exposed woodwork in interior construction shall be planed smooth.

(4). Basement floor may be concrete or any other incombustible material.

(5). Pipes or conduits extending through floors shall be fitted with metal thimbles and made watertight to a distance of 3 inches above floor.

(6). All floors shall be arranged to drain to elevator well or some other point where minimum damage will result from water.

(7). Roof coverings shall comply with requirements of Section 70, as specified for buildings within fire limits.

(8). Skylights shall be built according to the requirements of Section 76.

(9). Cornices shall comply with the requirements of Section 75.

Section 97—Partitions

(1). Partitions shall be constructed of incombustible material or of 2-inch matched plank or double matched boards with joints broken, preferably coated with fire retarding paint.

Section 98—Stairways and Elevators

(1). Stairways and elevators shall be enclosed by brick walls at least 12 inches thick, or reinforced concrete not less than 8 inches thick. Where one or more brick walls of stairway or elevator shafts are less than 8 feet on a side and contain no doorways, they may be 8 inches thick, but no wall of such thickness shall extend more than one story in height.

(2). When such shafts are inside of a building the walls shall pierce all floors and extend at least 3 feet above roof.

(3). All belts, or rope drives used to transmit power from floor to floor, shall be located in a special tower or shaft enclosed by masonry walls as provided for stairway and elevator shafts.

(4). Approved fire doors shall be installed at all openings into shafts. Those for stairway and power shafts shall be self-closing.

(5). Interior windows in shafts are prohibited.

(6). The bottom of all shafts shall be properly drained.

PART XIX**FIREPROOF CONSTRUCTION, AND FIRE-PROOFING****Section 99—General Requirements for Fireproof Buildings**

(1). The walls of every fireproof building shall be constructed as specified in Sections 16, 17 and 19. The floor and roof construction shall conform to the construction and test requirements specified in Sections 162 and 163. Reinforced concrete buildings constructed as specified in Part XX, shall be classed as fireproof construction.

(2). The space between the floor arches or slabs and the floor finish shall be solidly filled with concrete as specified in Section 116. The filling beneath wooden flooring shall be made flush with the under side of the floor boards.

(3). In buildings of Class E, except stables, also in apartment houses, clubs and hotels, when of fireproof construction, the floors shall be made impervious to water; they shall also be arranged to drain to scuppers or interior drainage pipes, provision being made to discharge water at the rate of 300 gallons per minute per each 1000 square feet of floor area.

Floor drainage for "Mill" Construction buildings, Sec. 69, par. 1.

(4). Except as permitted in Section 79, paragraph 1, all shafts and public hallways shall be enclosed and separated from the rest of the floor space by fire-resistive enclosures, as specified in Sections 80 and 81, and shall have floor surfaces and rim of approved incombustible material. The stairs and stairway landings shall be of approved incombustible material.

(5). No woodwork or other combustible material shall be used in the construction of any fireproof building, except wooden floor sleepers, grounds, bucks and nailing blocks when entirely embedded in incombustible material also the finish flooring, and interior doors and windows, when not otherwise specified, with their frames, trim, and casings; also interior finish when backed solidly with fireproof material, may be of wood. Wooden wainscotings more than 3 feet high, or wooden ceilings, shall not be permitted.

(6). Exterior wall openings shall be protected as required in Section 78.

Section 100—Fireproofing, Floor and Roof Construction

(1). Fireproof construction between steel floor or roof beams, shall consist of segmental arches of brick or concrete, or of segmental or flat arches of hollow terra cotta, or reinforced ~~cinder~~ stone, or gravel concrete; or of such other equally fire-resisting material or construction as may be approved by the Building Inspector. ~~after fire, water, and strength tests.~~

Specifications for fire tests, Sec. 162.

(2). All segmental arches shall have a rise of $1\frac{1}{4}$ inches to the foot of span. Steel tie-rods of proper size, spacing, and location shall be used in all arches to properly resist the thrust. Such tie rods shall be completely encased to a depth of at least 2 inches in fireproofing material which shall extend into and be anchored to the arch.

Tie-rods in reinforced concrete fireproof construction, Sec. 159.

(3). The spacing of floor or roof beams in fireproof construction shall not exceed 8 feet on centers except when the slabs between them are composed of reinforced stone or gravel concrete, in which case they shall be limited by the design according to Section 119.

(4). **Brick Arches.** Segmental arches of brick shall have a thickness of not less than 4 inches for spans of 5 feet or less, and 8 inches for spans exceeding 5 feet and not exceeding 8 feet. Brick arches shall be composed of good, hard common or hollow brick. The brick shall be laid to a line on the centers and properly and solidly bonded; each longitudinal line of

brick shall break joints with the adjoining lines. The arches shall spring from suitably designed solid skewbacks made of the same materials as the arches, and be properly keyed. The brick shall be well wet before laying, and the joints solidly filled with mortar.

(5). **Terra Cotta Arches.** Hollow terra cotta tile used for floor or roof arches shall be hard burned or semi-porous and of uniform density and hardness. All terra cotta arches shall be properly keyed. The key blocks shall always be placed within the middle third of the span.

Segmental arches shall have sufficient depth between the top and bottom faces to carry the load to be imposed, but not less than 6 inches. The tile shall have at least two cellular spaces in the depth.

Flat arches have a depth of not less than $1\frac{1}{4}$ inches for each foot of span between the beams, this not to include any portion of the depth of tile that projects below the under side of the beams. The total depth shall in no case be less than 9 inches, and the tile shall have not less than three cellular spaces in the depth.

The shells of arch blocks shall be not less than $\frac{3}{4}$ inch in thickness, and the webs shall be not less than $\frac{5}{8}$ inch in thickness. Every arch block shall have at least one continuous vertical internal web for each 4 inches in width. There shall be rounded fillets at all internal intersections. The skewbacks of all hollow tile arches shall be of such form and section as to accurately fit the beams and properly receive the thrust of the arches, and shall have shells at least 1 inch thick, and webs not less than $\frac{3}{4}$ inch thick.

The safe working load on terra cotta arches shall be determined by design, or by test as specified in Section 50. The allowable extreme fibre stress in compression in terra cotta floor tile shall be taken as 500 pounds per square inch on net section.

Test requirement for floor tile, Sec. 51.

(6). **Concrete Arches and Slabs.** All segmental arches or flat slabs of reinforced concrete shall be designed and constructed in accordance with the requirements of this section and of ~~Parts XX and XXI~~.

(7). **Roofs.** Hollow terra cotta or concrete tile, or solid gypsum blocks, may be used for fireproofing between the steel framework of roof construction; but such tile or blocks shall be not less than 3 inches thick, and the supporting steel members shall be spaced not more than 25 inches on centers. When solid blocks or tile are properly reinforced to resist the bending stresses, the steel supporting members may be spaced not to exceed 30 inches apart. The bottom flanges of steel members shall be protected as elsewhere provided.

Roof coverings, Sec. 70.

Section 101—Fireproofing, Protection of Structural Members

(1). **Protection of Wall Columns.** All columns which support steel girders carrying exterior walls, and all columns which are built into walls and support floors only, shall be protected against corrosion by a coating of Portland cement mortar at least $\frac{1}{4}$ inch thick and against moisture and fire by a casing of masonry, which shall be not less than 4 inches of brick or 3 inches of concrete on all surfaces all to be well bonded into the masonry of the enclosing walls.

(2). **Protection of Wall Girders.** The wall girders shall have a casing of Portland cement mortar and the same masonry protection as required for wall columns, all to be securely tied and bonded; but the extreme outer edge of the flanges of beams, or plates or angles connected to the beams may project within 2 inches of the outside surface of such casing. The inside surfaces of the girders shall be similarly protected by masonry,

or if projecting inside the walls, they shall be protected by concrete, terra cotta, or other approved fireproof material not less than 2 inches thick.

(3). All metal structural members which support loads or resist stresses, other than those provided for by the two preceding paragraphs, shall have a protection of fireproofing as herein specified. The protection material shall be brick, concrete, terra cotta, or gypsum block. ~~Concrete shall be of the quality prescribed in Section 109;~~ terra cotta may be solid or hollow, and shall be porous or semi-porous, neither shells nor webs shall be less than $\frac{5}{8}$ inch thick; gypsum blocks shall be solid and of quality approved by the Building Inspector. Plaster shall not be considered a part of any required fireproofing for metal structural members except where specifically mentioned as such.

(4). All bricks or blocks used for fireproofing shall be set in Portland cement mortar, except that gypsum blocks may be set in gypsum mortar.

(5). **Interior Columns.**

(a). The protection shall cover the columns at all points to a thickness of not less than 3 inches and be continuous from the base to the top of the column. The extreme outer edges of lugs, brackets, and similar supporting metal may project to within 1 inch of the outer surface of the protection.

(b) If brick or blocks are used for fireproofing columns, they shall be accurately fitted, laid with broken joints, and all spaces between the outside layer and the metal solidly filled with masonry; or concrete filling may be used. No voids between the metal and the protecting casing shall be permitted.

(c) Galvanized steel wire not smaller than No. 12 gauge, shall be securely wrapped around block column coverings so that every block is crossed at least once by a wire. The wire shall not be wound spirally around the column, but each turn or band shall be a separate unit and shall be twisted tightly or otherwise securely bound. Other equivalent anchorage may be employed if approved by the Building Inspector. No block used for this purpose shall exceed 12 inches in vertical dimension.

(d) Columns located in damp places shall receive a coat of at least 1 inch of Portland cement mortar before application of the fireproofing.

(e) Columns made of steel or wrought iron pipe filled with concrete, shall be protected by at least $1\frac{1}{2}$ inches of fireproofing.

(f) Where the fireproofing of columns is exposed to damage from trucking or handling of merchandise, the fireproofing shall be jacketed on the outside for a height of not less than 3 feet from the floor with metal or other approved covering.

(6). **Protection of Steel Girders and Beams.**

(a) The protection of the webs and bottom flanges of girders, and all members of trusses shall have a thickness of not less than 2 inches at all points. The protection of the webs and bottom flanges of beams, lintels, and all other structural members shall be not less than $1\frac{1}{2}$ inches at any point.

(b) If hollow terra cotta tile be used for protection, the lower flanges of beams and similar members shall be encased either by lugs which form part of the skewbacks and extend around the flanges meeting at the middle; or by tile slabs held in position by dove-tailed lugs projecting from the skewbacks. In either case care shall be taken to insure that all joints be solidly filled with mortar.

(7). Concrete protection for all structural members shall be held in position by suitably designed interior steel anchors hooked securely around the flanges or angles of the members, at intervals not exceeding 8 inches apart; these anchors shall be not less than $\frac{1}{8}$ inch in thickness if flat or $\frac{1}{10}$ inch in diameter if of wire, and shall be located at a distance not less than $\frac{3}{4}$ inch, nor more than 1 inch from the outside surface. Pro-

vision shall be made to prevent displacement of anchors while concrete is being deposited. When the flange width of steel members exceeds 6 inches, the wire used for anchoring the concrete protection shall be not less than $\frac{1}{8}$ inch diameter.

(8). Steel angle or channel struts, or other structural framing not elsewhere provided for, which are used for support in any wall, partition, or other construction, shall be fireproofed as required in this section.

(9). Metal fronts on the exterior of buildings over one story high shall be backed up or filled in with masonry not less than 8 inches thick.

Section 102—Miscellaneous Fireproofing Provisions

(1). Defective or damaged fireproofing materials shall not be used. All fireproof construction injured or damaged after being erected shall be repaired to the satisfaction of the Building Inspector before any filling or finish is placed over same.

(2). No pipes, wires, cables or other material shall be incased within or embedded in the required fireproof protection of columns or other structural members.

(3). All metal lath and plaster ceilings shall be supported by hangers or clamps attached to the floor or roof construction in an approved manner. Such supports shall be of such section and weight as will support the wet plaster without deflecting more than 1-30 inch per foot of span.

(4). All studding for metal lath partitions or wall furring shall be made from steel stock weighing not less than 0.5 of a pound per lineal foot, shall be spaced not over 16 inches center to center and shall be securely fastened to the floor and ceiling construction.

(5). Metal lath shall be of galvanized steel weighing not less than 54 oz. per square yard. Wire lath shall be not less than No. 20 gauge, and sheet metal lath not less than No. 24 gauge. Metal lath shall be laced to the supporting furring or studs at intervals not exceeding 6 inches.

(6). After floors are constructed, no opening greater than 2 square feet shall be cut through them unless suitable metal framing or reinforcing is provided around the opening. After pipes or conduits are in place, all openings around them shall be filled in solidly with fireproofing material unless approved close fitting individual sleeves are provided as specified in Section 142.

Section 103—Protection of Metal Structural Members in Non-Fireproof Building

(1). Steel girders and steel or iron columns which support masonry walls, other than those facing upon a street, shall be protected by at least 2 inches of fireproofing of the same materials and applied in the manner specified in Section 41, or by 2 inches of metal lath and cement plaster; the latter being applied in two layers with an air space between them. All other iron or steel columns shall be protected by at least 1 inch of metal lath and cement plaster or its equivalent. The lath shall be of quality specified in Section 102, paragraph 5.

Section 104—Partitions in Fireproof Buildings

(1). In fireproof buildings, all partitions enclosing public halls or separating the spaces occupied by different tenants, and all other permanent partitions, shall be built not less than 4 inches thick, of solid or hollow brick, terra cotta, concrete, or gypsum blocks or tile; or not less than 3 inches thick of reinforced concrete or solid metal lath and cement plaster; or of such other incombustible materials and thickness as shall meet the requirements of the partition fire test as prescribed in Section 162, paragraph 4. The required thickness for block or tile partitions shall be exclu-

approval of the Building Inspector.

sive of plaster. All such partitions shall be securely fastened to the fireproof construction of the floor and ceiling. All bricks, blocks or tile shall be laid with broken joints.

(2). All partitions not enumerated above shall be of incombustible materials, except for woodwork permitted in this code.

(3). All partitions in fireproof buildings shall be independently supported at each floor level, and where lateral support is not sufficient they shall be stiffened by such steel reinforcement encased in the construction as the Building Inspector may require and approve.

(4). Structural steel members necessary for supporting a partition, or for framing doorways or other openings through it, shall be protected by at least 1 inch of fireproofing. Cement plaster, or cement-tempered plaster may be accepted for this purpose if properly keyed.

(5). Reinforced concrete for partitions shall be as required in Sections 109, 143, and 144. Terra cotta tile shall be porous or semi-porous in quality, and if hollow, shall have two cells in the thickness, with the thickness of shells inclusive of plaster key, not less than $\frac{3}{4}$ inch, and the thickness of webs not less than $\frac{5}{8}$ inch. The shells and webs of hollow gypsum or concrete blocks or tile shall be not less than $\frac{3}{4}$ inch. Gypsum shall be used only in dry locations. Metal lath and studding shall conform to the requirements of Section 102.

(6). All openings in public hallway partitions shall be protected by approved fire doors or fire windows. Approved fire doors may be permitted in a partition separating tenants in a building, but no glass shall be permitted in openings in such partitions.

(7). If a stair hallway be considered as a part of the stairway, and the latter is not separately enclosed as required by Section 80, then the enclosing partitions for the hallway shall be considered as the stairway shaft, and shall be built according to the requirements of Section 41.

(8). If the partition surrounding a public hallway be erected in accordance with the requirements for a fire exit partition, it may be considered as a horizontal exit for an occupancy equal to area of the hallway in square feet divided by three.

Fire exit partitions, Sec. 43.

Horizontal exits, Sec. 42, par. 2.

Section 105—Fire-resistive Partitions in Non-Fireproof Buildings

(1). In non-fireproof buildings of Classes B, C, D, and E, all partitions enclosing public hallways, or separating the spaces occupied by different tenants, shall either be built as required in Section 43, or they may be built of not less than 3-inch approved solid or hollow partitions blocks or tile, or by 3-inch hollow or 2-inch solid metal studding and lath with cement plaster, or by 2x4 inch wooden studding with metal and $\frac{3}{4}$ inch of cement or cement-tempered plaster on each side; or of any other materials and thickness as shall meet the requirements of the partition fire test as prescribed in Section 162, paragraph 4. Wooden studs shall be set with the 4-inch dimension at right angles to the plane of the wall.

(2). All such partitions shall be protected by fire doors and windows as specified in Section 43.

(3). Openings in such partitions shall be protected by fire doors and windows as specified in Section 43.

(4). The principles governing hallway partition construction as stated in Section 104, paragraphs 6 and 7, shall apply to the construction of like partitions in non-fireproof buildings, consistent with the requirements of Section 104 for such construction.

Classification of buildings, Sec. 8.

PART XX

REINFORCED CONCRETE CONSTRUCTION
GENERAL REQUIREMENTS

Section 106—Definition

(1). The term "reinforced concrete" in this Code shall mean an approved concrete mixture in which steel is embedded in such a manner as to resist the tensile stresses and to add rigidity and strength to concrete in compression.

Section 107—Approved for all Types of Buildings

(1). Reinforced concrete will be approved for all types of building construction, provided the design conforms with good engineering practice, and the working stresses do not exceed those herein specified. The construction shall meet the requirements of this Code in all respects, and in addition shall conform to such other rules as may be issued by the Building Inspector or State authorities having jurisdiction.

Section 108—Construction Plans and Specifications

(1). The plans and specifications required to be filed with the Building Inspector shall be accompanied by stress computation and descriptions showing the general arrangement of the entire construction in all important details, including the size, length, and points of bending of all reinforcement, the qualities, proportions, and methods of mixing the materials used in the concrete and the dead and live loads each floor is designed to carry

(2). All such plans and specifications shall be signed by the architect, engineer, contractor or person applying for the permit. In no case shall the construction deviate from the approved plans and specifications except by written consent of the Building Inspector.

SPECIFICATIONS FOR MATERIALS

Section 109—Quality of Concrete

(1). The concrete shall consist of a mixture of a plastic or viscous consistency of one part of cement to not more than six parts of aggregate fine and coarse, either in the proportion of one part of cement, two parts of sand and four parts of stone or gravel, or in such proportion as to produce a maximum density. Such concrete shall develop a crushing strength of at least 2000 lbs. per square inch at 28 days when made under laboratory conditions of manufacture; the materials and consistency being practically the same as that used in the field. Test specimens shall be removed from moulds as soon as well set and stored in damp sand until tested.

Weight of concrete, Sec. 55.

(2). Concrete in the proportion of one part of cement to four and one-half parts of aggregate, which may be desirable for special work such as columns, shall develop a crushing strength of not less than 2,400 pounds per square inch at 28 days, and the working stress of such concrete may be increased 20 per cent. over that permitted elsewhere in this Part.

(2). Each test shall consist of a set of at least three duplicate specimens in the shape of cylinders with a height of double the diameter; or cubes having a least dimension of 6 inches. Cubes shall be tested standing on bed and 75 per cent. of the resulting test strength shall be assumed as the strength of the standard cylinder specimen 8 inches in diameter and 16 inches high. The average of the three tests shall be taken as the result for record. The smallest dimension of the test piece should be at least four times the size of the coarsest particle of stone.

(4). In addition to these preliminary tests which are necessary for

the purpose of design, the Building Inspector may require additional tests to be made upon specimens cast during construction of the building. The test specimens shall be secured at such times and in such portions of the structure as the Building Inspector may direct. This test concrete may be taken from the barrows as the concrete is being wheeled to place or from the forms after it is deposited. The results of such tests shall be considered in conjunction with the test of workmanship described in Section 165.

General requirements for tests, Sec. 149.

Quality of cinder concrete, Sec. 155.

Section 110—Quality of Cement

(1). All cement used in reinforced concrete shall be Portland cement meeting the requirements of Section 109.

Section 111—Quality of Fine Aggregate

(1). Fine aggregate shall consist of sand, crushed stone, or gravel screenings, passing when dry a screen having $\frac{1}{4}$ inch diameter holes and not more than 6 per cent, passing a sieve having 100 meshes per lineal inch. It shall be clean and free from quicksand, vegetable loam, perishable organic matter, or other deleterious materials.

(2). Fine aggregate shall always be tested. It shall be of such quality that mortar composed of one part Portland cement and three parts fine aggregate by weight, when made into briquettes shall show a tensile strength at least equal to the strength of 1:3 mortar of the same consistency made with the same cement and standard Ottawa sand, and shall show a tensile strength of at least 180 lbs. per square inch at the age of 7 days. If the aggregate be of poorer quality, the proportion of cement should be increased to secure the desired strength.

Section 112—Quality of Coarse Aggregate

(1). Coarse aggregate shall consist of crushed stone or gravel which is retained on a screen having $\frac{1}{4}$ inch diameter holes, and shall be graded in size from small to large particles. The maximum size shall be such that all the aggregate will pass through a $1\frac{1}{4}$ inch diameter ring. The particles shall be clean, hard, durable, and free from all deleterious material.

Aggregates for fireproofing, Sec. 152.

Concrete for footings, Sec. 16.

(2). Gravel shall be free from clay or loam, except such as naturally adheres to the particles. If clay or loam is in such quantities that it cannot be readily removed by dipping in water or brushing lightly with the hand, the gravel shall be washed. When bank-run gravel is used, it should be screened from the sand and remixed in the proper proportion for fine and coarse aggregate.

Stone shall be equal in strength to the hardest sand or gravel bank stone.

Section 113—Quality of Reinforcement

(1). All steel used in reinforced concrete shall meet the requirements of the current Standard Specifications for Billet-Steel Concrete Reinforcement Bars of the American Society for Testing Materials. No reinforcement produced from re-rolled rails or second-hand materials shall be used in any structure without the written permission of the Building Inspector. If such reinforcement be permitted, it shall meet the requirements of the current Standard Specifications for Rail-Steel Concrete Reinforcement Bars of the American Society for Testing Materials. Cold drawn steel wire made from open hearth billets of the grade of rivet steel or from Bessemer billets, may be used in floor and roof slabs, column hooping, and reinforce-

ment for temperature and shrinkage stresses. It shall have an ultimate strength of not less than 85,000 lbs. per square inch and test specimens shall bend 180 degrees around their own diameter without fracture.

FACTORS CONTROLLING DESIGN

Section 114—Allowable Unit Working Stresses

(1). In the design of reinforced concrete structures when the concrete is mixed in the proportions of 1:2:4, and satisfies the strength requirements of Section 162, the following working stresses for concrete and steel shall be used:

	Lbs. per Sq. in.
Extreme fibre stress on concrete in compression.....	650
Concrete in direct compression.....	500
Shearing stress in concrete when diagonal tension is not resisted by steel	40
Shearing stress in concrete when web reinforcement is propor- tioned to resist two-thirds of the external vertical shear.....	120
Bond stress between concrete and deformed bars.....	80
Bond stress between concrete and plain reinforcing bars.....	100
Tensile stress in steel reinforcement.....	16,000

Bearing on a concrete surface having a total area at least three times the area of the loaded portion, may be taken at 37½ per cent of the ultimate strength of the concrete, when all other stresses are properly provided for.

Compressive stress in steel as specified in Sections 57 and 58, or in the ratio of the moduli of elasticity of steel to concrete.

In continuous beams the extreme fibre stress in concrete in compression may be increased 15 per cent. adjacent to the supports.

In proportioning the section of concrete for shearing stresses, the effective depth from center of compression area to center of steel shall be used.

Stresses in concrete mixed in the proportions of 1:1½:3 in accordance with Section 57 may be increased 20 per cent in excess of the above stresses.

Working stress on cinder concrete, Sec. 155, par. 5.

Section 115—General Assumptions

(1). As a basis for calculating the strength of beams and slabs, the following assumptions shall be made:

- (a) A plane section before bending remains plane after bending.
- (b) The modulus of elasticity of concrete in compression remains constant within limits of working stresses fixed in this Code.
- (c) The adhesion between concrete and reinforcement is perfect.
- (d) Concrete has no value in resistance to tension.
- (e) Initial stress in the reinforcement due to contraction or expansion in the concrete is negligible.
- (f) The ratio of the moduli of elasticity of 1:2:4 stone or gravel concrete and steel inflexure shall be taken as 1:15.
- (g) The ratio of the moduli of elasticity of 1:1½:3 stone or gravel concrete and steel inflexure shall be taken as 1:12.

The span length for beams and slabs shall be taken as the distance from center to center of supports, but need not be taken to exceed the clear span plus the over-all depth of beam or slab. Brackets shall not be considered as reducing the clear span in the sense here intended.

Weight of concrete, Sec. 55.

BENDING MOMENTS OF UNIFORMLY LOADED FLOOR AND ROOF SLABS

Section 116—Bending Moments of Slabs Supported on Two Sides

(1). The bending moments of slabs due to uniformly distributed loads shall be taken as not less than:

1/8 WL, at center when simply supported.

1/10 WL, at center and continuous support when supported at one end and continuous at the other.

1/12 WL, at center and intermediate supports when continuous over more than two supports.

W = Total distributed dead and live loads.

L = Length of span.

Section 117—Bending Moments of Slabs Supported on Four Sides

(1). The bending moments of uniformly loaded slabs supported on four sides and reinforced in both directions shall be taken as:

1/8 WL, at center in each direction when simply supported.

1/10 WL, at center and continuous support when continuous over one support.

1/12 WL, at both center and supports when continuous over two or more supports.

Section 118—Distribution of Loads

(1). The distribution of loads on square and rectangular slabs supported on four sides, shall be determined by the following formula:

$$r = \frac{l^4}{l^4 + b^4}$$

in which r = the proportion of the load supported by the transverse reinforcement.

l=length of slab.

b=breadth of slab.

If the length of the slab exceeds 1½ times its width, the transverse reinforcement shall be designed to carry the entire load.

BENDING MOMENTS OF UNIFORMLY LOADED BEAMS AND GIRDERS

Section 119—Term Beam Defined

(1). The term "beam" as used in this section shall be understood to include the term girder, unless specific distinction be made.

Section 120—Beams with Simple or Continuous Supports

(1). The bending moments of uniformly loaded beams shall be taken as:

1/8 WL, at center when simply supported.

1/10 WL, at center and over continuous support when supported at one end and continuous at the other.

1/12 WL, at both center and supports when continuous over more than two supports.

Section 121—Beams Supporting Rectangular Slabs

(1). Beams supporting rectangular slabs reinforced in both directions, shall be assumed to take the proportions of load as determined by the formula in Section 118.

(2). The bending moments of slabs, beams or girders which are continuous for two spans only, shall be taken as 1/8 WL over the central support and 1/10 WL near the middle of the span.

GENERAL DESIGN REQUIREMENTS FOR BEAM AND SLAB CONSTRUCTION**Section 122—Special Members**

(1). The bending moments for slabs or beams with spans of unusual length or due to other than uniformly distributed loads, shall be more exactly computed according to accepted theory.

Section 123—Continuous Floor Construction

(1). In continuous slabs, beams or girders, full provision shall be made for the negative bending moments over the supports by placing sufficient negative reinforcement near the top of the members to resist the stress. This reinforcement shall pass beyond the point of inflection in beams or girders and be anchored in the compression concrete of the member a sufficient distance to develop the full strength of the steel through bond stress. The critical section of continuous construction is over the support.

Section 124—Web Reinforcement in Beams

(1). Members of web reinforcement in beams shall be designed for diagonal tensile stresses, using the calculated vertical shearing stress as a measure of these tensile stresses. They shall not be spaced to exceed three-fourth of the depth of the beam in that portion where the web stresses exceed the allowable value of the concrete in shear. It shall be assumed that two-thirds of the external vertical shear is provided for by the steel in calculating the stresses in stirrups, diagonal web members, and bent up bars; and the remaining one-third of the shear shall be assumed as taken by the concrete, in accordance with Section 114.

(2). Web members such as stirrups, when not rigidly attached to the longitudinal steel at both top and bottom, shall be carried around and bent over the longitudinal members or otherwise sufficiently anchored in the compression concrete to develop the tensile stresses existing in them. Diagonal members shall be rigidly attached to the longitudinal steel on the tension side. Stirrups at the ends of continuous girders shall be inverted with the free ends anchored in the compression concrete at the bottom of the beam. The length of stirrups or diagonals embedded in compression concrete shall be sufficient to develop their entire tensile stresses by adhesion.

Section 125—T Beams

(1). Where adequate bond is provided at junction between slab and beam, and the two are cast at the same time as a unit, the slab may be considered as an integral part of the beam, provided its effective width shall not exceed on either side of the beam one-sixth of the span length of the beam nor be greater than four times the thickness of the slab on either side of the beam; the measurements being taken from line of intersection between slab and beam.

(2). In beams with T sections the width of the stem only shall be used in calculating longitudinal shear and diagonal tension. An effective bond shall be provided at the junction of the beam and slab when the principal slab reinforcement is parallel to the beam, by the use of transverse reinforcement extending over the beam and well into the slab.

(3). In the design of T beams acting as continuous beams, sufficient compression area shall be provided on the under side at the support, either by the use of properly designed brackets or by embedding additional compression steel in the concrete extending to the point of inflection.

Section 126—Minimum Thickness of Slabs

(1). The minimum thickness of concrete floor slabs shall be 4 inches, and for roof slabs $3\frac{1}{2}$ inches.

Section 127—Floor Finish

(1). Cement or concrete floor finish shall not be considered in calculating the strength of floor members unless it be laid at the same time they are cast.

Section 128—Composite Floors

(1). The design of composite floors consisting of rows of hard-burned terra cotta tile, concrete blocks, sheet steel, or other approved fire resistive material, separated by ribs or beams of reinforced stone or gravel concrete, shall conform to all the provisions of this Part so far as they are applicable. The ribs shall be at least $\frac{5}{8}$ inches wide. The tile or blocks shall be regarded only as fillers, and shall not be considered in the design except as dead load. If designed as a T-beam, the slab portion above the fillers shall be at least $2\frac{1}{2}$ inches thick, and shall consist of the same mixture used for the ribs, and shall be cast at the same time; under these conditions it may be considered in the design of the ribs. Tile or concrete block fillers shall be laid with Portland cement mortar joints, and shall be thoroughly wet before the concrete is poured. The protection for steel bars in bottom of ribs shall be the same as for other beams.

To resist expansion stresses, reinforcement bars not less than $\frac{1}{2}$ inch diameter, shall be placed in the concrete at right angles to the ribs and above the fillers, at intervals not exceeding 30 inches.

DESIGN OF COLUMNS AND WALLS

Section 129—Length of Columns

(1). The length of columns shall be taken as the maximum unsupported length.

The unsupported length of columns shall not exceed fifteen times the least side or diameter, and in no case shall the least side or diameter be less than 12 inches. The length shall include any corbel or knee brace attached to the column.

Section 130—Columns Without Hoops

(1). Axial compression in reinforced concrete columns without hoops, bands, or spirals, containing not less than $\frac{1}{2}$ per cent., nor more than 3 per cent. of vertical reinforcement, secured against lateral displacement by steel ties placed not farther apart than fifteen diameters of the vertical rods, nor more than 12 inches, shall not exceed 500 pounds per square inch on the effective area of the concrete, plus 6000 pounds per square inch on the vertical reinforcement. The percentage of reinforcement shall be calculated upon the effective area of the column, which is the area within the reinforcement. Steel ties shall be not less than $\frac{1}{4}$ inch in diameter or least dimension. At least four vertical bars shall be used in every reinforced column, and no bar shall have an area of less than $\frac{1}{4}$ square inch.

~~Strength test requirements for concrete and steel, Sees. 114 and 162.~~

Section 131—Columns With Hoops

(1). Axial compression in reinforced concrete columns with not less than 1 per cent. of hoops or spirals (that is, a volume of steel equal to 1 per cent. of the volume of concrete within the hoops or spirals for a unit length of column) spaced not farther apart than one-sixth of the diameter of enclosed column, but in no case more than 3 inches, with not less than one nor more than 4 per cent. of vertical reinforcement, shall not exceed 750 pounds per square inch on the effective area of the concrete, plus 9000 pounds per square inch on the vertical reinforcement. The hoops or spirals shall be uniformly spaced, and shall be rigidly attached to at least four vertical bars in each convolution.

Columns required to be settled before being built upon, Sec. 146, par. 2.

Section 132—Structural Steel and Concrete Columns

(1). Axial compression in structural steel columns thoroughly encased in concrete having a minimum thickness of 4 inches and reinforced with not less than 1 per cent. of steel (that is, a volume of steel equal to 1 per cent. of the volume of concrete within the hoops) equally divided between vertical reinforcement and hoops or spirals spaced not more than 12 inches apart, may be taken at 16,000 pounds per square inch on the net section of the structural steel, no allowance being made for the concrete casing. The hoops or spirals shall be placed not nearer than 1 inch from the structural steel, or nearer than $1\frac{1}{2}$ inches from the outer surface of the concrete. The ratio of length to least radius of gyration of the structural steel section shall not exceed 120.

Tests for structural steel, Sec. 54.

Working stresses for structural steel, Sec. 56.

Section 133—Columns Constructed with Special Concrete

(1). In reinforced concrete columns the compression on the concrete may be increased 20 per cent. when the fine and coarse aggregates are carefully selected, and the proportion of cement to total aggregates increased to one part of cement to not more than four and one-half parts of aggregate, fine and coarse, either in proportion of one part of cement, one and one-half parts of sand and three parts of stone or gravel, or in such proportions as will secure the maximum density. The unit stress on the vertical reinforcement in such columns shall not exceed twelve times the unit stress on the concrete.

Section 134—Columns Eccentrically Loaded

(1). Bending stresses in columns due to eccentric loads, shall be provided for by increasing the section of concrete or steel so that the total unit stress shall not exceed the allowable working stress in flexure.

Section 135—Steel Base Plates

(1). Suitable steel base plates or castings shall be provided at the bottom of columns to distribute the loads over the footings, and the vertical reinforcement bars shall bear squarely on these plates, or the reinforcing bars shall be carried down into an enlarged footing to distribute the load through bond stress.

Section 136—Walls

(1). Exterior and interior bearing ~~and non-bearing~~ walls of reinforced concrete shall be securely anchored to all intersecting walls, columns, and floors, and the allowable compressive stress shall not exceed 250 pounds per square inch. The thickness shall be not less than two-thirds that specified for brick walls, and in no case less than 8 inches. All such walls shall be reinforced with steel running both horizontally and vertically. The amount of reinforcement shall be not less than 1-5 of 1 per cent. of the cross-section of the wall, and shall be equally disposed near each face of the wall; except that in walls or partition 8 inches or less in thickness, the reinforcement may be placed as a single layer in the middle. Reinforcement shall not be spaced more than 18 inches apart. Additional reinforcement shall be placed around wall openings, and all vertical and horizontal reinforcement shall be wired or have other mechanical bond at intervals not exceeding 18 inches in either direction.

Reinforced concrete partitions, Secs. 143 and 144.

GENERAL PROVISIONS FOR DESIGN OF GIRDERLESS FLOORS OR
FLAT SLABS

137—Girderless Floors

(1). Girderless floors or flat slabs consisting of reinforced concrete slabs resting upon columns with flaring heads, with or without drop heads or column caps, and in which no beams or girders are used, except around openings in the floor or along walls, shall be designed in accordance with the bending moment coefficients and stresses specified in this Code. No empirical formulas based on the results of tests shall be permitted, but the design shall in general be based upon the principles of continuous or cantilever construction as herein indicated.

(2). The methods of analysis shall be as follows:

(a) The portion of the slab adjacent to the column shall be considered as a circular plate supported at the center forming the cantilever portion. The remainder of the slab shall be considered as a simply supported portion suspended from the cantilever plates. The cantilever portion shall be designed for a uniform load over its area equal to the live and dead load on that area plus a concentrated load on its perimeter equal to the floor load resting on the suspended portion of the slab. The radius of the cantilever plate shall be the average distance from the center of the column to the points of inflection of the slab.

(b) Or the slab may be considered as consisting of a series of continuous broad, flat, girders reinforced with bands of steel consisting of rods supported at the top of the slab over the columns and depressed to the bottom of the slab at the center of the span. These bands of reinforcement may be arranged to run in two directions directly from column center to column center or in four directions, the former bands being combined with reinforcement running diagonally from column to column.

Section 138—Columns for Girderless Floors

(1). The column capital shall have a diameter or least side at the top in no case less than $0.225 L$ where L is the length of side of the square equivalent to the area of the rectangle included between four adjacent columns. The thickness of the column capital at this diameter shall be not less than $1\frac{1}{4}$ inches. The slope of the column capital shall nowhere exceed an angle of 45 degrees with the vertical.

(2). A depressed head or "drop" may be cast above the column capital and the dimensions of this cap shall be not less than 0.4 of the side of the equivalent square panel.

(3). The point of inflection shall be assumed one-sixth times the square root of 3 times L from the center of the column.

(4). The width of bands shall be such as to properly cover the panel area, but shall not be wider than 0.4 times the side of the square panel. Where steel is provided in two directions only, the central portion of the panel shall be considered as a slab supported on four sides.

(5). Punching shear shall be calculated at the edge of the column shaft and shall not exceed 120 lbs., per sq. inch. In computing shearing stress for the purpose of determining resistance to diagonal tension, a point shall be taken at a distance out from the column capital equal to the effective depth of the slab.

(6). Working stresses and coefficients shall in general comply with Sections 56 and 114 to 122, inclusive, of this Code. In rectangular panels, the long dimension shall not be more than four thirds times the short dimension. Interior columns shall be capable of resisting the unbalanced bending moment produced by a panel with live load adjacent to a panel without live load. Floor slabs at walls shall be considered as simply supported on walls or wall beams. If the proportion of the slab adjacent to a

wall column is assumed as a cantilever, the wall column or pier shall be capable of resisting the unbalanced moment shall extend at least to the quarter point of the span, and if the bars have a greater diameter than $\frac{3}{4}$ inch, special attention shall be given to bond and anchorage.

REQUIREMENTS FOR REINFORCEMENT

Section 139—External and Internal Defects

(1). All reinforcement shall be free from excessive rust, scale, grease, paint or any coating which would tend to reduce or destroy the bond between the steel and the concrete. Bars shall also be free from injurious seams, slivers, flaws, and other mill defects. The weight of any lot of bars shall not vary more than 5 per cent. from the standard weight of the lot as given by manufacturers' handbooks.

Section 140—Placing and Spacing or Reinforcement

(1). All reinforcement shall be accurately located and mechanically secured against displacement during the placing of the concrete. Reinforcement bars for slabs shall not be spaced farther apart than two and one-half times the thickness of the slab. The spacing of parallel bars in beams shall be not less than three diameters from center to center, nor less than one inch. The clear spacing between two layers of bars shall be not less than one inch. In restrained or cantilever construction reinforcement shall extend beyond the supports into adjacent construction for full and effective anchorage, except that when this is not practicable, anchorage shall be obtained by other means acceptable to the Building Inspector. Special reinforcement shall be provided to resist concentrated loads. Slabs reinforced in one direction only, shall have shrinkage rods not less than $\frac{1}{4}$ inch in diameter placed above the reinforcement and spaced not over 2 feet apart. All reinforcement shall be assembled well in advance of the placing of the concrete, and shall be inspected and approved by the Building Inspector before concrete is deposited.

Section 141—Protection for Reinforcement

(1). Steel reinforcement shall have a minimum protection of concrete on all sides as follows:

In columns and girders, 2 inches; in beams and walls, $1\frac{1}{2}$ inches; and in floor slabs, 1 inch.

The steel in footings for walls and columns shall have a minimum protection of 4 inches of concrete.

Section 142—Splices in Reinforcement

(1). Splices in reinforcing bars shall be designed to transfer the calculated stress at the joint either by bond and shear through the concrete, or by bearing between the steel. Splices at points of maximum stress shall be avoided where possible. Lap splices of bars shall be of sufficient length to develop the required stress in the joint without exceeding the bond stress permitted. In columns where necessary to splice vertical bars having areas in excess of $1\frac{1}{4}$ sq. inches, it shall be done by cutting the bars squarely at the ends and enclosing them in a close-fitting pipe sleeve, or uniting them by a threaded splice or other mechanical connection that will transfer the load from one to the other without stressing the adjoining concrete excessively. The middle point of such splices shall be within one foot above the floor level. Splices in column hooping where necessary, shall be sufficient to develop the full strength of the hooping.

WORKMANSHIP FOR CONCRETE

Section 143—Mixing

(1). The separate ingredients of concrete shall be accurately measured, and thoroughly mixed in a manner to produce a homogeneous mass

of uniform color and of such a viscous consistency that it will flow to all parts of the forms without separation of the coarse aggregate from the mortar.

(2). Except when limited quantities are required, or when the conditions of the work make hand mixing preferable, mixing shall be done in a mechanical batch mixer from which a complete batch shall be discharged before another is received. All ingredients shall be mixed together for at least one minute, the mixer making at least 20 revolutions.

Section 144—Depositing

(1). Concrete shall be deposited, thoroughly tamped and worked to place before initial set begins, and shall then be kept free from shocks and disturbances of every kind until it has fully hardened. Retempering of concrete after its initial set shall be prohibited.

(2). When the work of placing concrete is suspended, all necessary grooves for joining future work shall be made before the concrete sets.

(3). Before depositing new concrete upon concrete already set, the contact surfaces shall be roughened, cleaned of all laitance and loose material, and then drenched with water and slushed with a grout consisting of one part Portland cement and not more than two parts fine aggregate immediately before placing the fresh concrete. If a water-tight joint is desired, or if granolithic is to be deposited on old concrete, it is necessary that a neat cement grout be used.

Section 145—Drying and Freezing

(1). When fresh concrete is exposed to rapid drying conditions, precautions shall be taken to keep it moist for a period of at least seven days after being deposited. Where practical this shall be done by a covering of wet sand, burlap or some other equally effective method. Thorough wetting twice a day is recommended.

Section 146—Joints

(1). Construction joints shall be avoided wherever practicable, but when they are necessary they shall be located at such sections as will least affect the structural strength and shall be made at right angles to the direction of principal compressive stress. In members of floor systems, joints shall be made within the middle third of the span where practicable. In columns, joints shall only be permitted at the bottom face of the lowest connecting floor members. Temperature changes and shrinkage during setting necessitate joints in independent walls at intervals of 50 to 80 feet when not otherwise provided for by effective reinforcement.

(2). Girders, beams, and slabs shall not be cast upon freshly formed columns until a period of 4 to 6 hours have elapsed to permit settlement.

Section 147—Construction of Forms

(1). Forms shall be substantial and unyielding, and care shall be exercised to make them as nearly water-tight as practicable.

(2). Care shall be taken to insure that all debris is removed from forms, and that they are thoroughly greased or wetted before concrete is deposited in them. Beam forms shall be so designed that at least one side may be removed without disturbing the bottom portion of the forms and its supports; and column forms, so that they may be removed without disturbing beam and slab forms. Cleanout holes shall be provided in the bottom of column forms where necessary to insure the removal of wood chips or other debris.

Section 148—Removal of Forms

(1). The time for the removal of forms shall always be subject to approval by the Building Inspector.

Schedule.

Bottom of slabs, spans of 6 feet.....	4 days
plus 1 day extra for each additional foot of span.	
Bottom of beams and girders of ordinary length.....	14 days
Beams of span of 20 feet.....	21 days
Sides of lintels, girders and beams.....	3 days
Thin walls	3 days
Columns	3 days

(2). Girders of 25-foot span or over shall be considered as special cases and shall be subject to the inspection of the Building Inspector before removal of the supports .

(3). Composite floors, same as for ordinary beams.

(4). All reinforced concrete shall be carefully inspected to insure its soundness and reliability before main supports are removed.

(5). No loads shall be placed upon a reinforced concrete floor before the removal of the form supports which would in any way tend to overstress such supports or those below.

Section 149—General Requirements for Tests

(1). All tests upon reinforced concrete materials or construction, shall be made in accordance with the requirements of Section 162.

A set of plans shall be on file at the building upon which the Building Inspector shall mark in ink the progress of the work, and state the time and dates on which concrete for each portion of the structure was deposited, and the Building Inspector shall indicate thereon the date upon which the forms may be removed. Record shall also be made of the date upon which forms were actually removed.

PART XXI

REINFORCED CONCRETE FOR FIREPROOFING

Section 150—Approved Construction

(1). Concrete is approved for all fire-resistive construction, also for the protection of steel structural members, or for any other fire-proofing purposes in any building.

(2). Any system of reinforced concrete construction may be approved for the construction of floor or roof panels, or partitions in skeleton frame or any other type of fire-resistive building, provided that the unit stresses in the materials do not exceed those specified in this Code as permissible for use in such design and that the concrete and the construction conform to the various other requirements herein specified for such use, including the fire test.

Section 150—Mixture

(1). Concrete for fireproofing purposes shall consist of a mixture of viscous consistency of one part Portland cement to not more than seven parts of fine and coarse aggregate by volume. The aggregate shall be mixed in the ratio of two parts of fine to not more than five parts of coarse, or in such proportions as will give the densest mixture.

Section 152—Aggregate

(1). Fine aggregates shall be of quality described in Section 111.

Coarse aggregates shall consist of gravel, crushed stone, hard burned brick, terra cotta, slag, or steam boiler cinders, and shall be clean, hard, and free from deleterious material. All aggregates shall be sized to pass a 1 inch screen and be retained upon a $\frac{1}{4}$ inch screen, and shall be reasonably dry when screened.

Section 153—Manipulation

(1). Concrete for fireproofing shall be mixed, deposited, and protected in accordance with the requirements of Sections 140 to 149 inclusive, of this Code .

Section 164—Reinforcement

(1). The steel reinforcement in concrete used for fire-proofing, shall be of quality required by Section 113 and the installation shall be in accordance with the specifications of Section 141. The longitudinal members in mesh reinforcement shall not be spaced more than 4 inches center to center, and the least dimension of mesh opening shall be 2 inches. Mesh metal fabrics of all kinds shall have a side lap of not less than 3 inches.

(2). All reinforcement essential to secure the required strength of arches or slabs, shall be fully embedded in the concrete, and shall have a protection of at least 1 inch of concrete on the under side.

(3). Exposed metal centering or exposed metal of any kind shall not be considered a factor in the strength of any part of any concrete construction subject to fire; and a plaster finish applied over the metal shall not be accepted as sufficient protection.

Section 155—Cinder Concrete

(1). Cinder concrete may be used constructively as fire-proofing, only for floors and roofs between steel beams, and for interior non-bearing walls or partitions.

(2). Cinders shall be composed of hard, well burned, vitreous clinker, free from sulphides, fine ashes and foreign matter. The use of gas-house, or locomotive cinders, or stove or heating furnace ashes, is prohibited.

(3). In the selection of cinders for concrete, care shall be exercised to insure that they carry only a small percentage of unburned coal or coke. The amount shall not exceed 15 per cent.

(4). Cinder concrete in the proportions of 1:2:5 to qualify for use for fireproofing, except when used as fill above the floor arch proper, shall develop an average crushing strength of not less than 800 pounds per sq. inch at 28 days, when tested in accordance with the method of test prescribed for stone concrete in Sections 162 and 163.

(5). The allowable extreme fibre stress in compression in cinder concrete slabs between steel beams shall not exceed 300 pounds per sq. inch. The ratio of the moduli of elasticity of 1:2:5 cinder concrete and steel shall be taken as 1 to 30.

Weight of cinder concrete and fill, Sec. 55.

Section 156—Design Factors for Special Concrete

(1). The allowable working stresses and moduli of elasticity for concrete composed of aggregates other than stone, gravel, or cinders, shall be determined by the Building Inspector from results of actual tests.

Section 157—Floor Systems Approved on Design

(1). Segmental concrete arches or flat slabs shall be approved for fireproofing if designed and constructed in accordance with the requirements of Parts XX and XXI insofar as they are applicable; but the permissible stresses for cinder concrete shall be taken as specified in Section 155.

(2). The span of concrete arches or slabs for fire-proofing, shall be taken as the distance center to center of the supporting steel beams, and shall not exceed 8 feet unless the coarse aggregate in the concrete be either stone or gravel, in which case the span shall be limited by the design.

(3). The minimum thickness of arches or slabs of cinder concrete

for floor and roof construction, shall be $3\frac{1}{2}$ inches, and in no case less than one eighteenth of the span length between supporting beams.

Floor systems approved by test, Sec. 162.

Section 158—Concrete for Principal Bearing Members

(1). Except by written permit of the Building Inspector, the coarse aggregate in all concrete used in the construction of bearing walls, columns, piers, or girders, shall be stone or gravel.

Section 159—Tie Rods

(1). Segmental arches shall have a rise of not less than $\frac{3}{4}$ inch per foot of span, and steel tie rods of proper size, spacing, and location to resist the thrust shall be used. The rods shall be protected as required in Section 100, paragraph 2.

(2). In flat arches, if tie rods are omitted, the reinforcement shall be continuous, or the ends of the bars shall be hooked over the beams or otherwise securely fastened to them at intervals not exceeding 3 feet.

Section 160—Concrete Fill

(1). Concrete for fill shall consist of one part cement and not more than ten parts of aggregate. Aggregates shall be as specified in Section 111. All concrete fill shall be well mixed, thoroughly wet, tamped to place, and brought to a level at the required height. See Section 99, paragraph 2.

Section 161—Protection for Steel Structural Members

(1). Concrete used as fireproofing upon structural steel members shall have the quality, thickness, and be anchored as specified in Section 101.

PART XXII

FIRE TESTS OF CONSTRUCTION

Section 162—Specifications for Fire Tests

(1). None but approved materials or methods of construction shall be used in the erection of fireproof buildings.

(2). Fireproof construction and protective devices to qualify for use under test, shall have the approval of the National Board of Fire Underwriters or meet the requirements of the following specifications to the satisfaction of the Building Inspector and the Chief of the Fire Department.

(3). **Fire Test for Floors.** The fire test for floors shall be made on at least one full size span, and shall be continuous for four hours at an average temperature of 1700 degrees F. In this and all other respects the floor to be tested shall meet the requirements of the current specifications of the Standard Test for Fireproof Floor Construction prescribed by the American Society for Testing Materials; or the specifications for such test employed at the Laboratories of the National Board of Fire Underwriters.

(4). **Fire Test for Partitions.** The fire test for partitions other than those used for shaft enclosures, shall be continuous for two hours, the temperature rising to 1700 degrees F. in one-half hour, and averaging 1700 degrees F. for the balance of the test. In this and all other respects the partition to be tested shall meet the requirements of the current specifications of the Standard Test for fire proof Partition Construction prescribed by the American Society for Testing Materials, or the specifications for such test employed at the Laboratories of the National Board of Fire Underwriters.

(5). **Fire Test for Stair and Elevator Shaft Partitions.** The fire test for partitions used to enclose stair, elevator and other large shafts shall be continuous for three hours with an average temperature of 1700 degrees F., for the last two and a half hours of the test, and shall in all other respects conform to the requirements for fire test for partitions given in paragraph 4 of this section.

(6). **Fire Test for Doors and Shutters.** The size of test sample shall conform to the dimensions required for the maximum size of wall opening for which the device is designed up to and including 5 feet by 7 feet, and shall be mounted and hung in every respect as for ordinary service. It shall be subjected to a continuous fire upon one side for at least one hour, the temperature increasing to 1800 degrees F. within 30 minutes, and then rising gradually to a final temperature of 2000 degrees at the end of the hour. Immediately after the expiration of the fire test, while the door is still red hot it shall be subjected to a stream of water from a $\frac{7}{8}$ inch nozzle 20 feet distant from the door and under a pressure of 60 pounds per square inch at the nozzle. The stream shall be kept moving over the test sample for one minute.

A door to successfully pass this test shall not develop serious structural weakness; shall prevent the development of flame on the unexposed side of the door which extend more than a few inches from the door surface; the heat transmitted through or around the door shall not be sufficient to ignite burlap or similar combustible material placed 36 inches back from the door in a room surrounding the unexposed side of the door.

(7). **Fire Test for Windows.** The size of the test sample and the character of the test shall be the same as that prescribed for doors, except that the temperature shall rise gradually throughout the test to a maximum of 1500 degrees F. at the end. The application of water shall be the same as for doors. A test to be successful shall meet the requirements specified for doors, as to structural weakness and passage of flame, but no restriction shall be made as to the amount of heat transmitted through the window; furthermore small portions of glass dislodged by application of the stream of water shall not be considered as structural weakness. The size of wired glass panel in either window or door shall not exceed 720 square inches.

(8). **Fire Test for Approved Fire-resisting Roofing.** The roofing shall at least withstand the attack of burning fire brands for 5 minutes with a wind pressure of 5 miles per hour, without ignition of a clear dry white pine decking beneath it; and shall not crack and expose the decking, nor slip badly, nor convey or communicate fire badly, nor produce a serious flying-brand hazard when thus exposed. The test shall be made with the sample at the maximum angle of inclination advocated in practice. The brands shall consist of at least ten strips of seasoned hard maple 2 inches square and 3 feet long, formed into a frame or grid with a $1\frac{3}{4}$ inch space between them. The complete grid shall be thoroughly ignited and burning before application to the roof sample, which latter shall extend on all sides at least 18 inches beyond the edges of the grid.

Definition of approved roofing, Sec. 5, par. 7.

Requirements for roofing, Sec. 70.

(9). The fire resisting properties of any material or construction other than those already described in this section shall be determined by such tests as meet the approval of the Building Inspector.

Strength tests for materials, Sec. 45.

PART XXIII

STRENGTH TEST FOR FLOOR CONSTRUCTION

Section 163—Test of Sample Floor Panel

(1). Any system of fireproof floor construction intended for use between steel beams which is not susceptible of analysis and computation

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according to the rules of design, may receive approval for use for spans not exceeding 8 feet, on the basis of an ultimate load test as follows:

(2). The test shall be under the direction of the Building Inspector and shall be made upon a section of flooring not less than 4 feet wide, and of a span corresponding to the proposed construction. The test load shall be applied at points or loading areas located at the third points of the span. Each loading area shall consist of a zone of the slab surface not exceeding 1 foot in width, and of a length corresponding to the width of the test slab. Rigidity of the steel framework may be secured in any manner acceptable to the Building Inspector, but in all cases one end of the test panel shall be constructed to reproduce the conditions of an outside or end panel in a building.

A loose sand bed not over one inch thick may be provided between the floor and the load. Approved methods shall be used for applying the test load and measuring the deformations. The load shall be applied gradually, and a complete record of loads and deformations shall be kept throughout the test. The allowable working load shall be one-sixth the total load causing failure, thus providing for a factor of safety of approximately eight on the basis of a uniformly distributed load.

(3). The Building Inspector shall keep record of all details of test construction, and approved constructions shall thereafter be installed in every respect in accordance with said record.

(4). The application of a test load to a segmental arch may vary from the method given in paragraph 2 if necessary, but any change shall be approved by the Building Inspector, and care shall be taken to avoid possibility of arching in the load.

(5). If for reasons stated in paragraph 1 a floor panel composed of cinder concrete, or concrete made from other fireproofing materials, is entitled to a test for approval; or if the methods or results of calculation for such a floor system are unsatisfactory to the Building Inspector, he may require a confirmation test. In either case the test shall be applied in the manner stated in paragraph 2 except that if the system is installed in practice with both ends of the floor panel freely supported, it shall be so tested; if installed in practice with both ends of the reinforcement securely anchored to the supporting beams, it shall be so tested. In each case an adjoining span may be built at one end, of the same length and thickness as the test span. If the reinforcement consists of wire mesh or similar material installed by laying the mesh continuously over the supporting beams, it shall be considered as a condition affording only partial restraint, and the test construction shall be installed as follows: One end of the test section shall be freely supported on the steel beam, and the other end made continuous by installing a span equal to the test span in length and thickness, and embedding the reinforcement therein in the usual manner.

The test construction shall be 30 days old on the day of the test.

Section 164—Test of Systems of Construction

(1). When a construction engineer, contractor, or builder proposes new methods or principles in combining concrete, steel or other structural materials, not provided for by this Code; or designs a construction in which the stresses are indeterminate, he shall furnish for record with the Building Inspector, plans and specifications giving in detail the construction and calculations used in his design. He shall also prepare a sample portion of the construction and submit it to an ultimate load test in a manner satisfactory to the Building Inspector; or the Building Inspector may accept satisfactory evidence that such test has been made upon the particular system proposed. Such evidence shall comprise full details of a test and the results, and shall show the deflections and other effects on the construction at all steps during the test. If the test shows that the

construction, based on specifications submitted, has a factor of safety of four on total dead and live load, and that the design, stresses, and coefficients specified by this Code are not exceeded, and it otherwise meets the approval of the Building Inspector, he shall issue regulations under which such construction may be used. No such regulations, however, shall have the effect of altering the working stresses and the requirements for fireproofing specified in this Code.

Section 165—Test of Workmanship for Floor Construction

(1). Whenever the Building Inspector has doubt as to quality of materials or workmanship in any building, he may require the owner or contractor at his own expense to make such tests as will establish the safety of the construction before certificate of occupancy is issued.

Certificate of occupancy, Sec. 6.

(2). The test shall be under the direction of the Building Inspector, and shall show that the construction will safely sustain a load equal to twice the live load for which it was designed, for a period of 24 hours without injury or permanent deformation. In the test of a floor arch the load shall be applied to a typical arch of average span between beams. If less than a whole arch between girders is tested, the test section shall be cut apart or isolated from the rest of the arch before applying the load; such test section shall have a width of at least 4 feet measuring parallel to the beams.

(3). The load shall consist of such materials and shall be so placed as to form a uniformly distributed load over the entire area to be tested without arching effect. In case sand or similar material is used for loading, it shall be loose in bottomless bins, and not in sacks or packages of any kind. A complete record of loads and deformations shall be kept throughout the test.

(4). At least 30 days shall have elapsed after removal of forms from concrete flooring before a test load is applied.

(5). If the portion tested should fail to meet the requirements of this test, the Building Inspector may still approve the structure for use, and if necessary tests shall be repeated on different portions to determine the critical load. The detail records of this test, and the results of the tests upon the samples of concrete used in the construction, shall be taken into consideration by the Building Inspector in determining the working load to be permitted. However, it shall be specifically understood that no sub-standard construction shall be accepted by the Building Inspector, if in his judgment it is sufficiently defective to be unsafe for the purpose intended.

Test of sample floor panel, Sec. 163.

Strength tests for materials, Sec. 45.

PART XXIV

Begin here

CHIMNEYS, FLUES AND HEATING APPARATUS

Section 166—Chimneys, Smoke Flues, Gas Flues and Fireplaces

(1). All chimneys hereafter erected shall be of brick or stone laid in Portland cement mortar without addition of lime, reinforced concrete or other approved incombustible material, extending at least 3 feet above the point of contact with a flat roof or 2 feet above the ridge of a pitch roof, and shall be properly capped with terra cotta, stone, cast iron, or other approved incombustible weatherproof material.

(2). The brickwork or reinforced concrete of the smoke flues of all boilers, furnaces, baker's ovens, large cooking ranges, large laundry stoves,

and all flues used for a similar purpose shall be at least 8 inches in thickness. Walls of smoke flues used exclusively for ordinary stoves or open fireplaces shall be not less than 4 inches thick. Brick set on edge shall not be permitted in chimney construction.

(3). Where two or more smoke flues are contained in the same chimney, the walls between the several flues shall be not less than 4 inches thick. The walls of stone smoke flues shall be 4 inches thicker than required for brick or reinforced concrete. No smoke flue shall have smoke pipe connections in more than one story of a building.

(4). Every smoke flue contained in a chimney hereafter erected shall have an area of at least 64 square inches and, unless required to be lined with fire brick, shall be lined with hard burned terra cotta or fire clay flue lining made smooth on the inside. The flue lining shall start from the bottom of the flue, or from the throat of the fireplace if the flue starts from a fireplace, and shall be carried up continuously the entire height of the flue. If the thickness of the masonry surrounding the throat be less than 8 inches in any part, the lining shall start at bottom of the lintel. The ends of the sections of all such lining tile shall be laid in cement mortar and the tile shall be built in as the flues are carried up.

No parging mortar nor plaster shall be used on the inside of any fireplace, chimney, or flue.

(5). In every building, where one or more smoke flues start from the cellar or lowest story, at least one such smoke flue shall have an internal cross-sectional area of at least 96 square inches and shall start at least 3 feet below the ceiling.

(6). In no case shall a chimney be corbeled more than 8 inches from the wall, and such corbeling shall consist of at least five courses of brick. Piers which support chimneys shall start from the foundation on the same line with the chimney breast. They shall be not less than 12 inches on the face and shall be properly bonded into the walls. No chimney shall rest upon, nor be carried by woodwork. No combustible furring or sheathing shall be placed against any smoke flue or chimney breast.

(7). The walls of flues used only for gas burning appliances shall be of brick or concrete at least 4 inches thick and lined as required in paragraph 4 of this section. Where two or more such flues are contained in the same chimney, the walls between the several flues shall be not less than two thicknesses of the tile lining with joints broken, except that at least every third partition shall be not less than 4 inches thick of brick or its equivalent, and bonded into the walls. Not more than one appliance or utensil in which gas is used as fuel shall be connected to a single flue, nor shall any such appliance or utensil be connected to any flue to which a smoke pipe is connected.

(8). The smoke flue of every high pressure steam boiler and every appliance producing a corresponding temperature in the smoke flue shall, if built of brick, stone, reinforced concrete or other approved masonry, be lined on all sides with not less than 4 inches of fire brick laid in fire mortar for a distance of at least 25 feet from the point where the smoke connection of the boiler enters the flue.

(9). Interior vertical smoke stacks or flues for steam boilers or other furnaces, and similar heating devices producing a corresponding temperature, may be of metal not less than No. 10 U. S. gauge, properly riveted, jointed, and braced at intervals of at least 20 feet. Such stacks shall either be enclosed by approved masonry walls not less than 8 inches thick with an air space of at least 4 inches between lining and wall; or if such stacks or flues are not enclosed with masonry they shall have a clearance from all combustible material of not less than one-half the diameter of the stack, but not less than 24 inches, unless the combustible material be properly guarded by loose fitting metal shields, in which case the distance shall be not less than 12 inches. Where such a stack passes through

a wooden framed roof, it shall be guarded by a galvanized iron ventilating thimble extending from at least 9 inches below the underside of the ceiling or roof beams to at least 9 inches above the roof, and the ventilating thimble shall have a clearance of not less than 18 inches, except that for stacks for low grade furnaces such as hot air, hot water, and low pressure steam heating furnaces, coffee roasting ovens, candy furnaces, etc., the clearance may be reduced to 12 inches. Metal smoke stacks shall not be permitted to pass through floors. Smoke flues shall not be permitted inside of vent flues for ranges.

Protection for vent flues and ducts, Sec. 172.

(10). Exterior metal smoke flues for boilers, large cooking ranges, and similar heating devices, shall be of approved construction and supported on approved masonry foundations, and shall have a clearance of at least 4 inches from the outside wall. Such flues having an area not exceeding 255 square inches shall be constructed of not less than No. 16 U. S. gauge metal; if the area exceeds 255 square inches the thickness of the metal shall be not less than No. 10 U. S. gauge.

(11). The smoke flue of every smelting furnace and of every other similar device which heats the flue to an extremely high temperature, shall be built with double walls of thickness suitable for the temperature. There shall be an air space between the walls, and the inside wall shall be of fire-brick not less than 4 inches thick.

(12). Chimneys of cupalo-furnaces, blast-furnaces, and similar devices, shall extend at least 10 feet above the highest point of any roof within a radius of 50 feet, and no woodwork shall be within 3 feet of any part of any such device or its chimney.

(13). When a building or structure extends more than 10 feet above the roof of an adjoining building or structure, the owner of the higher building, if requested in writing during its construction by the owner of the adjoining building or structure, shall at his own expense extend the adjoining flues of such adjoining building to the same height as the chimneys of his building, or shall supply sufficient flues connecting such adjoining flues with the chimneys of his building.

(14). All fireplaces and chimney breasts where mantels are placed, whether intended for ordinary fireplace use or not, shall have trimmer arches or other approved fireproof construction supporting hearths. The arches and hearths shall be at least 20 inches in width measured from the face of the chimney breast. The arches shall be of brick, stone, terra cotta or reinforced concrete of approved thickness. The length of the trimmer arch and the length of the hearth shall be not less than the width of the chimney breast. The hearth shall be of brick, stone, tile or other approved fireproof material. False fireplaces shall only be permitted against unfurred masonry walls.

(15). No coal burning heater shall be placed in a fireplace which does not conform to the foregoing requirements and have an incombustible mantel. No wood mantel or other woodwork shall be placed within 8 inches of the side nor within 12 inches of the top of any open fireplace. No combustible summer piece or fireboard shall be used in connection with any open fireplace. The firebacks of all fireplaces shall be of solid masonry not less than 8 inches thick.

(16). When a grate is set in a fireplace, a lining of fire-brick at least 2 inches in thickness shall be added to the fire-back, or soapstone, tile or cast iron may be used, if solidly backed with brick or concrete.

All flue-holes when not in use shall be closed with tight-fitting metal covers.

Protection of woodwork around chimneys, Sec. 67.

Section 167—Smoke Pipes

(1). No smoke pipe shall pass through any floor, nor through a non-

fireproof roof. Smoke pipes for large cooking ranges, hot air furnaces, low pressure steam or hot water boilers shall be not less than 18 inches below any wood lath and plaster or other combustible ceiling, unless at least the upper half of such smoke pipe is properly protected by 1 inch or more of asbestos covering or its equivalent, or by a metal casing spaced 2 inches from the upper half of the pipe. If so protected smoke pipes shall be not less than 9 inches from any wood lath and plaster construction, woodwork or other combustible material. Smoke pipes from ordinary stoves shall be not less than 9 inches from any exposed woodwork.

(2). Where a smoke pipe passes through a wood lath and plaster or other combustible partition or wall, a section of the partition or wall shall be removed and the smoke pipe so placed that no part of it shall be nearer than 12 inches to any remaining combustible part of the partition. The section of the partition or wall so removed shall be replaced by approved fireproof material only, and an air space of at least 2 inches shall be preserved on all sides of the smoke pipe.

Section 168—Heating Furnaces and Appliances

(1). High pressure steam boilers, bakery ovens or furnaces in which fires are maintained producing a high degree of heat, shall rest on the ground, a trimmer arch, or a fireproof floor constructed in accordance with Section 100.

(2). Low pressure heating boilers, coffee roasters, fire-heated candy kettles, laundry stoves, coal ranges without legs, and similar appliances where hot fires are used, shall rest upon fireproof foundations as above described. However, the Building Inspector's written permission may allow them to be placed upon wooden floors if the floors are protected by sheet metal or a $\frac{1}{8}$ inch layer of asbestos building lumber, covered with not less than 4 inches of masonry set in cement mortar. Such masonry shall consist of one course of 4 inch hollow terra cotta, or of two courses of brick or terra cotta, at least one of which shall be hollow and be laid to preserve a free circulation of air throughout the whole course. Concrete may be substituted for a course of solid brick if desired. The masonry work shall be covered by sheet metal of not less than No. 26 gauge, so arranged as not to obstruct the ventilating passages beneath. Such hearths shall extend at least 12 inches on the sides, back, and front of the furnace, range or similar heating appliance; if solid fuel is used, the front extension shall be at least 24 inches.

All stoves or ranges with legs shall be set on incombustible material which shall extend at least 24 inches in front when solid fuel is used.

(3). Any woodwork or wooden lath and plaster partition within 4 feet of the sides or back, or 6 feet from the front of any such boiler, furnace, or heating appliance, shall be covered with metal shields or other approved incombustible material to a height of at least 4 feet above the floor. This covering shall extend the full length of the boiler, furnace, or heating appliance, and to at least 5 feet in front of it. Such metal shields shall be so attached as to preserve an air space behind them. In no case shall such combustible construction be permitted within 2 feet of the sides or back of the heating appliance, or 5 feet in front of same.

(4). Heating boilers shall be encased on sides and top by incombustible protective covering not less than $1\frac{1}{2}$ inches thick, and the overhead clearance of such covered boilers and hot air furnaces shall be not less than 15 inches. Any woodwork within 2 feet of the top of such boilers or furnace shall be protected by a loose fitting metal shield, but such shields shall not be placed so as to form concealed spaces.

Sprinklers over boilers, Sec. 182, par. 1 (e).

Section 169—Stoves and Ranges

(1). No kitchen range or stove in any building shall be placed less than 3 feet from any woodwork or wooden lath and plaster partition,

unless the woodwork or partition is properly protected by metal shields, in which case the distance shall be not less than 18 inches. Metal shields shall be so attached as to preserve an air space behind them.

(2). Hotel and restaurant ranges shall be provided with a metal hood placed at least 9 inches below any wooden lath and plaster or wooden ceiling, and have an individual pipe outlet connected with a flue in accordance with the requirements of Section 172. The pipe shall be protected by at least 1 inch of asbestos covering, or its equivalent.

(3). No furnace, boiler, range or other heating appliance shall be placed against a wall furred with wood.

Section 170—Hot Air Pipes and Registers

(1). All stone or brick hot air flues shall be lined with tin or other suitable sheet metal or burnt clay pipe.

(2). Horizontal hot air furnace pipes shall be placed at least 6 inches below wooden floor beams or wooden lath and plaster ceiling; if the floor beams or ceiling are protected by metal lath and plaster, or if the woodwork be covered with loose fitting tin, or the pipe be covered with at least $\frac{1}{2}$ inch of corrugated asbestos, the distance from the woodwork may be reduced to not less than 3 inches.

(3). Cold air ducts for hot air furnaces shall be made of incombustible material.

(4). Hot air pipes where passing through combustible partitions or floors, must be doubled tin pipes with at least 1 inch air space between them.

No hot air pipe shall be placed in a wooden stud partition or any wooden enclosure unless it be at least 8 feet horizontal distance from the furnace. Hot air pipes contained in combustible partitions shall be placed inside another pipe arranged to maintain $\frac{1}{2}$ inch air space between the two on all sides, or be securely covered with $\frac{1}{2}$ inch of corrugated asbestos. Neither the outer pipe nor the covering shall be within 1 inch of wooden studding, and no wooden lath shall be used to cover the portion of the partition in which the hot air pipe is located. Hot air pipes in closets shall be double, with a space of at least 1 inch between them on all sides. The air space between pipes shall be open at bottom and closed at top.

(5). Every hot air furnace shall have at least one register without valve or louvres.

(6). A register located over a brick furnace shall be supported by a brick shaft built up from the cover of the hot-air chamber said shaft shall be lined with a metal pipe, and no woodwork shall be within 2 inches of the outer face of the shaft.

A register box placed in the floor over a portable furnace shall have an open space around it of not less than 4 inches on all sides, and be supported by an incombustible border.

Hot air registers placed in any woodwork or combustible floors shall be surrounded with borders of incombustible material, not less than 2 inches wide, securely set in place.

The register boxes shall be of metal, and be double; the distance between the two shall be not less than 1 inch; or they may be single, if covered with asbestos not less than $\frac{1}{4}$ inch in thickness, and if all woodwork within 2 inches be covered with metal.

Section 171—Steam and Hot Water Pipes

(1). No steam or hot water pipe shall be within 1 inch of any woodwork. Every steam or hot water pipe passing through combustible floors or ceilings, or wooden lath and plaster partitions, shall be protected by a metal tube 1 inch larger in diameter than the pipe and be provided with a close-fitting metal cap on each side of the floor or partition. All wooden boxes, or casings enclosing steam or hot water heating pipes, or wooden

covers to recesses in walls in which steam or hot water heating pipes are placed, shall be lined with metal, and the pipes shall be kept at least 1 inch away from the walls of the box. Steam and hot water pipe coverings shall be of incombustible material.

Section 172—Vent Flues and Ducts

(1). Vent flues or ducts for the removal of foul air in which the temperature of the air cannot exceed that of the room, may in non-fireproof buildings, be constructed of sheet metal or other incombustible material. When used in connection with an exhaust fan, such duct shall not be placed nearer than 1 inch to any woodwork. All such ducts shall open to the outside of the buildings.

(2). All openings into such vents or ducts shall be protected by automatic or self-closing fire doors, or by automatic closing metal louvres or dampers.

(3). Vent flues and ducts connected with hoods over restaurant ranges shall be constructed in accordance with the requirements for smoke flues, Section 166, and for smoke pipes, Section 167, and shall be used for no other purpose.

(4). All ducts from blower heating and ventilating systems which pass through stories shall be made of or protected throughout by approved fire-resisting material not less than 3 inches thick if of brick, block, or tile; or 2½ inches of solid metal lath and cement plaster. Where such ducts serve more than one story, automatic dampers shall be provided on all outlets opening directly from such ducts and at all connections with branch ducts.

Vent shafts in fireproof buildings, Secs. 80 and 82.

Section 173—Dry Rooms

(1). No combustible materials shall be permitted in the construction of any dry room in which a temperature of 125 degrees F. or over may exist. If a temperature under 125 degrees F. is to be used, the dry room may be constructed of wood, but shall be lined throughout with ½ inch asbestos or ½ inch plaster board and covered with sheet metal; or the covering may consist of metal lath or plaster board, plastered to a total thickness of at least ¾ inch. Cement plaster or cement-tempered plaster shall be used.

PART XXV

EXISTING BUILDINGS RAISED, ALTERED, REPAIRED OR MOVED

Section 174—Buildings Raised, Altered, Repaired or Moved

(1). Within the fire limits every existing building having a combustible roof, if raised to produce an additional story, shall be provided with an incombustible roof.

(2). No building within the fire limits having masonry walls shall be enlarged or built upon unless the addition to the exterior walls be of approved incombustible materials.

(3). No existing building shall be altered to exceed the limits of height or area provided by this Code for new buildings of the same class as that to which the additions are made.

(4). No existing frame building shall be raised to a height exceeding 30 feet, except that dwellings occupied by not more than one family, may be raised to 35 feet. Buildings so raised shall comply with paragraph 1 and all the requirements of this Code relating to frame buildings.

(5). Within the fire limits no frame building more than two stories in height shall be altered to be used as a factory, warehouse or stable.

(6). No frame building within the fire limits shall be increased in area by frame additions, except that frame extensions to be used exclusively for toilet purposes may be permitted, but any such extension shall have an approved roof covering.

(7). Any frame building which may hereafter have the first story converted into a store, shall have the walls, partitions and ceiling of such first story covered with metal lath or $\frac{1}{2}$ inch fibre plaster board and plastered to a total thickness of at least $\frac{3}{4}$ inch; or the plaster board may be covered with sheet metal. Fire stops shall also be provided at the line of the ceiling to cut off all connection to stories above through hollow stud partitions or side walls.

(8). Any existing frame building within the fire limits, which may hereafter be damaged by fire, decay or otherwise to an amount greater than 25% of its value exclusive of the foundation, shall not be repaired or rebuilt, but shall be immediately removed.

In case the owner of the damaged building shall be dissatisfied with the decision of the Building Inspector that such building is damaged to a greater extent than 25% of its value exclusive of the foundation, the amount and extent of such damage shall be determined upon an examination of the building by three competent persons, one of whom shall be appointed by the Building Inspector, another shall be appointed by the owner of the building and the third shall be appointed by the.....

.....Board of Fire Underwriters; a decision of a majority of these surveyors reduced to writing and sworn to, shall be conclusive, and such building shall in no manner be repaired or rebuilt until after such decision shall have been rendered.

(9). No frame building shall be moved from without to within the fire limits.

(10) No building shall be moved until a permit has been obtained from the Building Inspector and he shall not issue such permit unless said building is to be removed from the Fire District within the city limits of Miami. Detail plans of the new location and streets to be used for moving of building shall be filed with the Building Inspector. Sufficient bond shall be given to insure the city against any damages that might be brought about by the removal of the house before permission is given to remove any building.

PART XXVI

FRAME BUILDINGS

Section 175—Permissible Wooden Buildings or Structures Within Fire Limits

(1). No frame building or structure shall be erected within the fire limits except the following; and all roofs placed upon such buildings or structures shall have approved covering:

(a) Temporary one story frame buildings for use of builders, and temporary stands, platforms, booths and tents for which permits shall be obtained from the Building Inspector. Such frame structures for use of builders in connection with the erection of a new building shall be removed as soon as the building is completed; other temporary frame structures shall be removed as soon as they have ceased to serve the original purpose for which they were permitted;

(b) One story sheds open on the long side, not over 15 feet high, with sides covered with incombustible material, and with an area not exceeding 500 square feet. A wooden fence shall not be used to form the back or side of such sheds;

(c) Wooden fences not over 10 feet high;

(d) Piazzas or balconies not exceeding 10 feet in width, nor extending more than 3 feet above the second-story floor beams. No such structure shall extend beyond the lot line, or be joined to any similar structure of another building;

- (e) Bay windows when covered with incombustible material, and as limited by Section 91, paragraph 4.
- (f) Small outhouses not exceeding 150 square feet in area and 8 feet in height;
- (g) ~~Ice houses not exceeding 15 feet in height nor more than 300 square feet in area.~~ Wooden sheds, ~~ice houses~~, or outhouses shall not be located within 5 feet of any lot line, nor less than 30 feet from any other building over one story high.
- (h) Signs as provided by Section 227.

amended Section 176—Frame Buildings Outside of Fire Limits

(1). No frame building shall exceed two stories or 30 feet in height, except that dwellings occupied by not more than two families may have two and one-half stories, provided they do not exceed 30 feet in height or 3000 square feet in area. The attic in a two-and-a-half story house may be used for sleeping rooms, but not for living purposes. No family shall be domiciled above the second story. Dwellings occupied by not more than one family may be three stories or 35 feet high. Towers, turrets or minarets on such buildings may exceed the foregoing limit 10 feet, provided the greatest horizontal dimension of such structures does not exceed 15 feet; except also that a church spire may be constructed of wood to a height not exceeding 75 feet from the ground, but such spire shall not be placed nearer any other building or structure than the equivalent of its height measured from its masonry support to the pinnacle.

(2). All frame buildings or structures, shall have approved roof coverings.

Requirements for roof coverings, Sec. 70.

Buildings classed as frame, Sec. 8, par. 2.

(3). No frame building erected for any occupancy other than buildings of Class F, shall cover a ground area exceeding 5000 square feet, except as restricted in paragraph 5.

(4). Except also that a frame building equipped with an approved system of automatic sprinklers, may have an increase in area of 66 2/3 per cent, or 8333 square feet.

(5). Frame buildings of Class F, and frame buildings of other classes having an area exceeding 5000 square feet without sprinklers, shall not be placed within 35 feet of any side or rear lot line; and if the area exceeds 7500 square feet, the distance from a side or rear lot line shall be not less than 100 feet.

(6). The combined area of frame buildings, sheds and outhouses located on any lot shall not exceed 80 per cent. of the lot area.

(7). In no case shall a frame building with wooden siding be erected or altered, to extend within 5 feet of the side or rear lot line, nor within 10 feet of another building, unless the space between the studs on such side be filled solidly with not less than 2½ inches of brickwork or other equivalent incombustible material, and the entire exposed side be covered with at least a ¼ inch layer of asbestos board, or ⅜ inch of plaster board back of the wooden siding. When such walls are thus filled and covered, their distance from side or rear lot line may be reduced to 3 feet; or to 5 feet from another building. If the adjacent walls of two buildings have no openings, and are filled and covered as above specified, there need be no limitation as to distance between them.

Alterations in existing frame buildings, Sec. 174.

(8). Floor beams and rafters in frame buildings shall be not less than 2 inches in thickness. All frame or wood buildings exceeding 15 feet in height shall have their sills secured to the foundations in an approved manner and be erected with sills, posts, girts and plates of suitable size and materials with proper mortise and tenon framing and braced with

studs at all angles, but this shall not prohibit the use of balloon framing with proper sills and ribbon strip not less than $1\frac{1}{4}$ by 5 inches where diagonal sheathing is used, and provided that the outside walls are fire stopped at each floor level.

Quality of timber, Sec. 53.

Timber stresses, Sec. 57.

Section 177—Foundations for Frame Buildings

(1). The foundation walls of frame buildings or structures exceeding 15 feet in height shall rest on footings of stone or concrete not less than 8 inches in thickness. All footings shall extend at least $4\frac{1}{2}$ inches outward from each side of the bottom of the foundation walls which rest upon them.

(2). The bottom of footings for frame buildings shall rest upon solid ground at a depth at least equal to the frost line below the surface, unless solid rock occurs above this point; or upon piles or ranging timbers of wood where necessary. The foundation walls of frame structures exceeding 15 feet in height, if of stone, shall be not less than 16 inches thick, and if of brick or concrete, not less than 12 inches to the grade and 8 inches thick to the under side of the sill. If the foundation and first story walls are constructed of brick or concrete, the foundation walls shall be not less than 12 inches thick to the first tier of beams and 8 inches thick from the first to the second tier of beams, or if these walls are constructed of stone, they shall be not less than 18 inches for the foundation walls and 16 inches for the first story wall.

Piles under frame building, Sec. 17, par. 6.

(3). Foundation walls of hollow building blocks shall be not less than 12 inches thick in any part, and shall be constructed as specified in Section 15, paragraph 4.

(4). For one story structures not used for dwellings, the thickness and depth of the foundation walls may be modified at the discretion of the Building Inspector.

(5). Footings and foundation walls shall be laid in cement mortar.

(6). In all frame buildings which are to be lathed and plastered or otherwise sheathed on the inside, all stud walls and all partitions which rest directly over each other, shall be completely fire-stopped with brick work or other suitable incombustible material at each floor level. The spaces between the ends of floor joists which rest upon masonry foundation walls or upon wall girts, shall be filled solidly with fire-stopping material to the full depth of the joists, and the spaces between the studs shall be filled in the same manner to a height of 6 inches above the floor level. Partitions which rest over each other shall be fire-stopped as required in Section 87, paragraph 3. The fire-stopping shall be arranged to cut off all concealed draft openings, and form an effectual horizontal fire barrier between stories.

Section 178—Cellar Ceiling in Frame Buildings

(1). The ceiling over the cellar or lowest floor in every frame building more than one story in height, except dwellings, shall be covered with metal lath and at least a $\frac{3}{4}$ inch coat of cement or cement-tempered plaster; or by a $\frac{1}{2}$ inch layer of plaster board covered with a $\frac{3}{4}$ inch coat of plaster or with a layer of sheet metal.

Cellar ceilings in non-fireproof buildings, Sec. 89, par. 5.

Section 179—Chimneys

(1). All chimneys in frame buildings shall conform to the requirements for chimneys in Section 166.

PART XXVII

STANDPIPE REQUIREMENTS

Section 180—Standpipes for Fire Department Use

(1). In existing buildings not already provided with a 4 inch or larger standpipe, and in buildings hereafter erected, there shall be provided:

For buildings in excess of 4 stories or 55 feet in height and not within 75 feet of exposing buildings, a standpipe not less than 4 inches in diameter;

For other buildings in excess of four stories or 55 feet in height, a standpipe not less than 5 inches in diameter;

For buildings in excess of six stories or 75 feet in height, a standpipe not less than 6 inches in diameter.

(2). Standpipes shall be located within fireproof stairway inclosures. Provided that, where existing buildings do not have such inclosures, the standpipes shall be as near stairway as possible, or shall be on the outside of, embedded within or immediately inside an exterior wall and within 1 foot of a fire escape, fire tower, or outside exit stairway.

(3). One standpipe shall be provided for each separate fire area exceeding 2500 square feet area, with at least one standpipe within 75 feet of every exterior wall in the building.

(4). Where more than one standpipe is required in a building they shall be connected at their bases by pipes of size equal to that of the largest standpipe, so that water from any source will supply all the standpipes.

(5). Standpipes shall extend from the cellar to and through the roof, with a 2½-inch hose connection and gate valve not over 5 feet above floor level in each story, including cellar, and two 2½-inch hose connections, with gate valve for each, on the roof; roof connections to have a controlling gate valve under the roof and arranged to be operated both from above and below the roof, with ¾-inch drain pipe and valve to prevent freezing.

(6). Where standpipes are located inside of building, hose sufficient to reach to all parts of the fire section, but not in excess of 100 feet, shall be attached to each outlet, with hose for roof-hydrant either in hose house on roof or on rack in top story near roof scuttle. Hose shall be not less than 2½ inches in diameter, and provided with stand couplings in use by the local fire department.

(7). Hose to be approved linen in 50-foot lengths, made under specifications recommended by the National Board of Fire Underwriters.

(8). Each line of hose shall be provided with washers at both ends, and be fitted with smooth-bore brass play pipe or nozzle at least 12 inches long, with discharge outlet 1½ inches in diameter. One spanner to be located at each hose connection.

(9). Standpipes shall be wrought iron or steel, galvanized, and, together with fittings and connections, shall be of such strength as to safely withstand at least 300 pounds water pressure to the square inch when ready for service, without leaking at joints, valves or fittings; such test to be made by the Chief of the Fire Department.

(10). Standpipes shall be connected to a Siamese steamer connection outside of the building by a pipe of diameter equal to that of the largest standpipe supplied. Such connection shall be made on each street front, except that corner buildings having one street frontage of less than 50 feet may have only one connection. Siamese shall be about one foot above the curb level, and shall be provided with check valves, and substantial caps to protect thread on the connection; the thread shall be uniform with that used by the local fire department. A suitable iron plate with raised letters shall be provided, reading: "To Stand-pipe."

Just inside of the building, in a horizontal section, shall be placed a

straight-way check valve. A drip pipe, with valve to same, shall be placed between said check valve and Siamese connection to properly drain this section to prevent freezing.

(11). Fire pumps, permanently connected to the stand-pipe system, shall be provided for buildings eight stories or more in height and in any building in excess of 10,000 square feet area, with capacities as follows:

One 4- or 5-inch standpipe, pump capacity not less than 500 gallons a minute;

One 6-inch standpipe or two inter-connected 5-inch standpipes, pump capacity not less than 750 gallons a minute;

Two 6-inch standpipes, pump capacity not less than 1000 gallons a minute.

Pump to have an adequate source of power and be supplied from street main or from well or cistern containing at least one hour's full supply; suction piping to be well installed.

Section 181—Standpipes for Private Protection

(1). In existing and new buildings three stories and higher, except as given below, there shall be provided a standpipe not less than 2 inches in diameter, with water supply constantly maintained or furnished automatically with the opening of a hose valve.

Exceptions: Buildings equipped with inside standpipe for fire department use (See Section 180) and having also 1½ inch connection with hose attached, and automatic water supply, all as provided in paragraphs 2, 3, and 4 of this section;

Dwellings;

Churches;

Other buildings having maximum undivided fire section of less than 2500 square feet area and provided with at least one 2½ gallon approved chemical extinguisher to each fire section;

Sprinklered buildings where the requirements of this section are met by connecting hose to sprinkler riser.

(2). Supply shall be from one of the following sources:

Street main, where pressure is sufficient to maintain not less than 25 pounds at hose outlet in top story;

Gravity tank of 2500 gallons capacity, with bottom 25 feet above outlet in top story;

Pressure tank of 3750 gallons capacity, located in top story or on roof;

Automatic pump of at least 250 gallons a minute capacity.

Provided that, if standpipe is intended also for fire department use (see Section 180), tank or pump capacity shall be at least double that given above.

(3). Where a standpipe is connected to fire pump or provided with Siamese connection, a straight-way check valve shall be provided in connecting pipe to tank, and tank filled by a separate pipe, and where the water in such tank is also used for house supply, the house supply pipe shall extend above the bottom of the tank to such a height as will reserve for fire purposes not less than the quantities required in paragraph 2.

(4). Standpipes shall extend from the cellar to the roof, with a 1½ inch hose connection and gate valve not over 5 feet above floor level, in each story, including cellar and roof.

Hose sufficient to reach to all parts of the fire section, but not in excess of 100 feet, shall be attached to each outlet; hose for roof outlet may be placed on rack in top floor near the scuttle leading to the roof. Hose shall be 1½ inches in diameter, and provided with nozzle having ½ inch discharge outlet.

(5). Standpipes and hose shall comply with the requirements of Section 180; paragraphs 3, 4, 7 and 9 except that 150 pounds test pressure will be required.

PART XXIX

SPRINKLER REQUIREMENTS

Section 182—Sprinklers

(1). In all new or existing buildings, an approved automatic sprinkler system, so constructed as to protect every square foot of floor area, shall be provided as follows:

(a) In every cellar, basement or sub-basement, including spaces under sidewalks, used for the manufacture, sale or storage of combustible goods or merchandise.

Exceptions: Class A, B, C and D buildings and office buildings, except such portions of cellars, basements and sub-basements as are used for storage purposes or as workshops.

All buildings outside the fire limits and with basement section of less than 2500 square feet area.

Classification of buildings, Sec. 8.

(b) Throughout all buildings having maximum fire area in excess of those permitted in Section 35;

(c) Throughout all buildings of Class E and F, where the height exceeds 5 stories, except that in office buildings such system shall be required only in sample, shipping, storage or stock rooms which exceed 1000 square feet area and contain combustible goods or supplies not stored in enclosed fire-resisting shelving.

(d) Throughout Class E and F buildings over 2 stories high, used for the manufacture, sale or storage of combustible goods or merchandise, if within 50 feet of other buildings having wall openings not protected as given in Section 78, or if in non-fireproof buildings.

(e) Over all heating furnaces or boilers in Class A, B, C and D buildings unless in fireproof rooms, except dwellings.

Sprinklers in communicating stores, etc., Sec. 26, par. 3.

(2). Sprinkler heads shall be a kind approved by the Underwriters' Laboratories, Inc., of Chicago, or by the Associated Factory Mutual Laboratories, of Boston.

(3). Sprinkler heads shall be so placed as to thoroughly protect all parts of the area in which they are installed, including spaces under stairs, inside elevator wells, in belt, cable, pipe, gear and pulley boxes, inside small enclosures, such as drying and heating boxes, tenter and dry room enclosures, chutes, conveyor trunks, and all cupboards and closets unless they have tops entirely open and are so located that sprinklers can properly spray therein. Each sprinkler head to protect not in excess of 100 square feet area.

(4). The size of riser serving any one floor or one fire area shall not be less than the following, and the number of sprinklers on a given size pipe on one floor of one fire area shall not exceed the following:

Size of Pipe.	Maximum No. of Sprinklers Allowed.
$\frac{3}{4}$ inch	1 sprinkler
1	2 sprinklers
$1\frac{1}{4}$	3 "
$1\frac{1}{2}$	5 "
2	10 "
$2\frac{1}{2}$	20 "
3	36 "
$3\frac{1}{2}$	55 "
4	80 "
5	140 "
6	200 "

(5). Each system shall be provided with an outside screw and yoke gate valve so located as to be readily accessible and to control all sources of water supply, except that from steamer connections. Drain pipes shall be provided, and the system so installed as to drain all parts.

(6). A dry pipe system shall be used only when a wet pipe system is impracticable, as in buildings which have no heating facilities.

(7). Two independent water supplies shall be provided, at least one of which shall be automatic. Provided that, where sprinklers are required only in cellars, basements, and first stories, a connection to street main will be deemed sufficient.

(8). Pressure tanks, if used, shall have a total capacity of not less than 4500 gallons (3000 gallons of water), and in any event the tank or tanks shall contain sufficient water supply 12½ per cent. of the greatest number of sprinklers within a fire area on any one floor for 20 minutes with an average discharge of 20 gallons per minute per sprinkler.

(9). Gravity tanks, if used, shall contain an available quantity of water sufficient to supply 25 per cent. of the greatest number of sprinklers in a fire area on any floor to which it gives protection, for 20 minutes with an average discharge per sprinkler of 20 gallons per minute, but tank shall be not less than 5000 gallons available capacity.

Elevation of bottom of tank above the highest line of sprinklers on the system which it supplies shall be not less than 20 feet.

Requirements for tanks, Sec. 74.

(10). Fire pumps, if used, shall be of not less than 500 gallons capacity per minute, and sufficient to supply 50 per cent. of the number of sprinklers within a fire area on any floor with an average discharge per sprinkler of 20 gallons a minute. Pump to have an adequate source of power and be supplied from street main or from well or cistern containing one hour's full supply for the number of sprinklers judged liable to be open by fire at any one time; suction piping to be well installed.

(11). The system shall be connected to a Siamese steamer connection outside of the building by a pipe of diameter equal to that of the largest standpipe supplied. Such connection shall be made on each street front, except that corner buildings having one street frontage of less than 50 feet may have only one connection. Siamese shall be about 1 foot above the curb level and shall be provided with check valves, and substantial caps to protect thread on the connection; the thread shall be uniform with that used by the local fire department. A suitable iron plate with raised letters shall be provided, reading: "To Basement Sprinkler" or "To Cellar Sprinkler," where only these are installed, or "To Automatic Sprinkler" where entire building is equipped.

(12). Just inside of the building, in a horizontal section, shall be placed a straightway check valve. A drip pipe, with valve to same, shall be placed between said check valve and Siamese connection to properly drain this section to prevent freezing.

(13). Piping shall be wrought iron or steel, galvanized, and, together with fittings and connections, shall be of such strength as to safely withstand at least 150 pounds water pressure to the square inch for 2 hours when ready for service, without leaking at joints, valves, or fittings; such test to be made by the Chief of the Fire Department.

(14). All such sprinkler equipments shall be in accordance with the regulations of, and plans shall meet the approval of the Chief of the Fire Department.

PART XXIX

CONSTRUCTION AND EQUIPMENT OF THEATRES

Section 183—Buildings Covered

(1). Every theatre or opera house or other building or parts of building designed or used for theatrical or operatic purposes, or motion

picture shows, for the accommodation of a total of more than 300 persons on all tiers, shall be built to comply with the requirements of this Code.

Definition of theatre, Sec. 5, par. 68.

(2). **Alterations.** No building which at the time of the passage of this Code is not in actual use for the purpose indicated in paragraph 1, shall be altered or added to for the purpose of converting the same into a theatre, opera house, or for use by a motion picture show, unless when altered or added to, it conforms to the requirements of this Code.

(3). **Approvals Required.** No building described in par. 1 shall be opened to the public until the Building Inspector shall have approved the same in writing in conformity with Section 6 of this Code, nor until the Chief of the Fire Department shall have certified in writing that all appliances for the extinguishing of fire conform to the requirements of Section 182 of this Code, and to the special requirements of the Fire Department, and are in a complete and satisfactory working condition.

(4). **Fireproof Building Over Auditorium.** Nothing herein contained shall prevent the construction of a thoroughly fireproof building above a fireproof theatre, provided no part of such fireproof building shall be placed above that portion of any such building which is known as the stage section. The portion containing the theatre, including all passages, lobbies and other accessories connecting therewith, shall be cut off vertically from such fireproof building by unpierced fire walls of solid masonry not less than 12 inches thick, and horizontally by unpierced fireproof floors of strength to safely sustain a live load of 150 lbs. per sq. ft, on every superficial foot.

(5). **Roof Garden.** A roof garden or open air auditorium (but no other place of public amusement) may be constructed above a fireproof building used for theatrical purposes built in conformity with the requirements of this Code. Such roof garden or open air auditorium shall have not less than 60 per cent. of its total floor area open to the sky without a roof, except that a cover of glass and metal skylight construction may be provided, and no part of its seating floor, or space upon which seats might be placed, shall be at greater height than 90 feet above the curb level at the main entrance to the building. The total capacity of such roof garden or open air auditorium shall not exceed 750 persons. The construction of such roof garden or open air auditorium shall be fireproof and shall conform in every way to the requirements of this Code.

(6). The size of entrances and exits, corridors and stairways shall be 50 per cent. greater than the corresponding requirements for theatres where the orchestra floor is at, or about the street level. If an audience is to be assembled in the theatre, at the same time as in the open air auditorium or roof garden constructed above the same, then the provisions for such entrance and exit herewith required for the latter shall be entirely distinct from and in addition to the provisions for exits and entrances, corridors and stairways required for the structure below.

(7). If any structure is built over the ceiling or roof of any building used for a theatre, the girders, trusses or other metal members supporting said structure shall be protected against fire by at least 3 inches of fireproof material with special provision to reinforce or support it.

(8). **Occupancy Restricted.** No portion of any building erected or altered used or intended to be used for a theatre, shall be occupied or used for any business dealing in any article or material dangerous to life in the opinion of the Building Inspector.

The before-mentioned restrictions relate not only to that portion of the building which contains the auditorium and the stage, but apply also to the entire structure in conjunction therewith.

(9). **Workshops and Property Storerooms.** No workshop, storage or general property room shall be allowed in or under the auditorium, above

the stage or under the same, or in any of the fly galleries; but such rooms or shops may be located in the rear of, or at the side of the stage, and in such cases they shall be separated from the stage vertically and horizontally by a brick or concrete wall not less than 12 inches in thickness or other equally efficient cut-off, and the openings leading into said portion shall have self-closing fire doors on one side of the wall and automatic fire doors on the other side of the wall.

(10). No sleeping accommodations shall be allowed in any part of the building communicating with the auditorium or stage.

(11). **Separation of Vestibule from Auditorium.** Interior fireproof walls or partitions shall separate the auditorium from the entrance vestibule, and from any communicating room or rooms over or under the same, also from any lobbies, corridors, refreshment or other rooms forming part of the theatre; the openings in all such walls shall be protected by approved fire doors or fire windows. The doors shall be self-closing, and the windows shall be stationary.

(12). **Floors.** All floor surfaces shall be of concrete or other incombustible material, and no wooden boards or sleepers shall be used as a covering for floors, seat platforms, aisles, steps, landings, passages or stairs.

(13). **Trim.** No combustible doors or trim shall be used in the auditorium, and none of the walls or ceiling shall be covered with wooden sheathing, wainscoting, or other combustible material, but this shall not preclude the construction of a wooden sounding board over orchestra pit when the same extends back of and below the overhang of the stage, provided the said wooden sheathing be properly fire stopped by a 12-inch brick wall back of same, and also have a proper fireproof construction directly under the overhang of the stage extending from the brick wall to the apron of stage.

(14). **Seats.** All seats in the auditorium except those contained in boxes accommodating not more than 12 persons shall be firmly secured to the floor, and shall be placed not less than 32 inches from back to back, measured horizontally. If benches without arms between seats are used, their capacity shall be figured on the basis of one person to each 18 inches in width.

(15). No seat in any gallery shall have more than four seats intervening between it and an aisle, or more than ten seats in a row between any two aisles.

(16). **Gallery Platforms.** No platforms in galleries formed to receive the seats, shall be more than 21 inches in height of riser nor less than 32 inches in width of platform. No such platform shall be nearer than 8 feet from the ceiling.

(17). **Tunnels or Cross Aisles.** There shall be no more than 11 feet rise, measured vertically, in any aisle in any gallery without direct exit by tunnel or otherwise to a corridor or passage with a free opening to the gallery stairs or other direct discharge to the street. At such elevation of 11 feet or less, an intervening or cross aisle leading directly to an exit may be substituted for the tunnel. No such tunnel or cross aisle shall be less than 4 feet wide in the clear.

(18). **Aisles—Width of.** Aisles shall be not less than 3 feet wide at the beginning, and all aisles shall be increased in width toward the exits 3 inches for every 10 feet of length.

(19). The Building Inspector shall determine the number of persons which every such building may accommodate. This determination shall be based on the actual number of seats, exclusive of required isles, passage-ways and lobbies. No more than the number so determined and certified by the Building Inspector shall be allowed in such structure at any one time.

(20). **Steps in Aisles.** Steps in aisles shall be the full width of the aisle. No risers shall be more than 9 inches in height, and no tread shall be less than 10 inches in width, and whenever the rise of seat platforms is

4 inches or less, the floor of the aisles shall be made as a gradient. Where steps are placed in passages they shall be grouped together and shall be clearly lighted. No stool, seat, or other obstruction shall be placed in any aisle.

(21). **Floors at Exits.** In the auditorium there shall be no step within 4 feet of the front of an exit or entrance doorway, nor within one foot of the side thereof.

(22). **Passages.** The width of passages and hallways shall be computed in the same manner as that hereinafter provided for stairways, but no passage may be less than 5 feet in width.

(23). All passages, hallways, and stairways leading from any balcony or gallery in any direction shall permit of free passage to an exit, without returning.

(24). The aggregate capacity of the foyers, lobbies, hallways, passages, and rooms for the use of the audience, not including aisle space, shall on each tier be sufficient to contain the entire number to be accommodated on said tier, in the ratio of 150 superficial square feet of floor for every hundred persons.

(25). **Calculation of Exits.** The combined width of entrances and exits for each tier, likewise their stairways, shall provide one foot of width for each 20 persons to be accommodated in that tier.

NOTE—The following explanation may be of interest with relation to entrance and exit calculations:

A large number of actual counts made by reliable authorities (see paper entitled "A Terminal Station", presented by Messrs. J. Vipond Davies and J. Hollis Wells before the American Institute of Architects at Washington, D. C., December, 1909) show that with freely moving crowds going in one direction, an average of thirteen (13) people per foot of width per minute will pass down a stairway. This figure was accordingly selected as the basis for estimating the combined width of entrance and exit stairs, allowing a period of 2 minutes in which to empty each tier.

Considering the probability of unfavorable conditions due to a panic or other causes, the width of entrance and exit stairs is figured on the assumption that two-thirds of the audience may pass out at either side of the auditorium.

The calculation under the above conditions for determining the necessary total width for entrance and exit stairways, for any specified number of people such as 500, would have this form:

$$\frac{2/3 \times 500}{2 \times 13} \times 2, \text{ or in reduced form } 500 \div 19.5$$

For further simplification, the derived number is assumed as 20 instead of the actual 19.5. This will give stairs but slightly narrower than those which would be obtained by applying the formula in detail, and makes the calculation extremely simple.

It is further specified that the width of the entrance stairways shall be at least 50 per cent. of the total stairway capacity provided by this calculation.

To encourage the audience to divide and thus offset in part at least the instinctive tendency to escape by way of the most familiar entrance, the aggregate width of exit doorways opening from each gallery shall be at least 60 per cent. wider than the exit stairways to which they lead; persons after reaching the exit stairways and balconies are comparatively safe when they have passed beyond the exit doorways opening from any tier under consideration.

Attention is also called to the minimum requirements for both stairways and doorways which must always obtain.

(26). The width of entrance stairways shall be at least 50 per cent.

of the combined width of the entrance and exit stairways, and the aggregate width of emergency exit doorways opening from each gallery shall be 60 per cent. more than the stairways to which they lead.

(27). **Entrances.** A common place of entrance may serve for the orchestra floor of the auditorium and the first gallery, provided such entrance and the passages leading thereto are of the width required for the aggregate capacity of these two tiers.

(28). Separate places of entrance shall be provided for each gallery above the first.

(29). Where the number accommodated in the gallery exceeds two hundred, there shall be at least two separate and distinct entrances.

Section 184—Entrances on Street Fronts

(1). Every building used for the purposes designated in Section 183 shall have at least the front or one side wall bordering on a street and not less than one-half of the openings required for entrance of the audience to the auditorium shall be provided in such wall or walls.

(2). Entrances opening directly on a street shall not be on a higher level from the sidewalk than four steps of $7\frac{3}{4}$ inch rise.

(3). Where any entrance does not open directly on a street, corridor, or passage connecting with the street, it shall be constructed of continuous walls of brick or other fireproof material equally efficient. The roof construction of these corridors shall be fireproof and of strength sufficient to safely sustain a live load of 150 pounds per square foot of area. The height of such corridors shall be not less than 10 feet. No doors or windows shall be permitted in the side walls or roof.

Section 185—Emergency Exits

(1). From the auditorium at least two emergency exits remote from each other leading into open courts or streets shall be provided in each side wall of the auditorium on all tiers. Each exit shall be provided with approved fire doors.

Entrances in courts, Sec. 200.

Section 186—Entrance and Exit Doorways

(1). The minimum width of doorways shall be 5 feet in the clear, except emergency exit doorways, which may be 44 inches.

(2). All entrance and exit doors shall open outward, and be hung in such manner as not to obstruct any part of the required width of a doorway, passage or stairway. The fastenings of these doors shall be such as can readily be opened from the inside at all times without the use of keys or any special knowledge or effort. The use of draw bolts is prohibited. All such doorways shall be entirely unobstructed.

Section 187—Marking Exits

(1). Every entrance and exit doorway opening from the auditorium shall have over the same on the auditorium side the word EXIT inscribed in legible letters not less than 6 inches high, or an illuminated sign with letters of the same height. Auditorium entrances and exits shall be numbered with figures not less than 6 inches high.

(2). No mirrors shall be so placed as to give the appearance of doorway, exit or passage. There shall be no false doors or windows.

Section 188—Diagram of Exits

(1). There shall be legibly printed on the program of each performance a separate diagram or plan of every tier. Each such diagram shall occupy a space not less than 15 square inches and shall show distinctly the entrances and exits from each tier and where they lead.

Section 189—Stair Landings

(1). When stairs turn at an angle or return directly on themselves, a landing without steps, of the full width of both flights, shall be provided. The outer line of landings shall be curved to a radius of not less than 2 feet; this provision, however, shall not apply to emergency exit stairs on outside of buildings. When two side stairways connect with one main stairway, the width of the main stairway shall be at least equal to the aggregate width of the side stairways. No stairway shall ascend to a greater height than 12 feet without a level landing, and the length and width of such landing shall be not less than the width of the stairs; no run of stairs shall consist of less than six risers between platforms.

Section 190—Stair Rails

(1). All stairways shall have on both sides strong hand rails. Where stairways are built between walls, rails shall be firmly secured to the walls about 3 inches distant therefrom. All rails shall be about 3 feet above the treads. This provision shall also apply to all steps in side aisles of galleries. The width of all stairs shall be measured between hand rails. All stairways and landings between stories, when 7 feet and over in width, shall be provided with a center hand rail of metal, not less than 2 inches in diameter, placed at a height of about 3 feet above the treads and landings. Such rails shall be supported on metal standards securely bolted to the treads or risers of the stairs. At the head of the stairway at each story, a newel post shall be provided at least 6 feet in height, to which the rail shall be secured.

Section 191—Entrance Stairways

- (1). No entrance stairway to any tier in the auditorium shall be less than 5 feet wide.
- (2). Entrance stairways and passages for the dressing rooms shall be at least 36 inches wide and extend independently to the street or court. No stairs in the stage section shall be less than 30 inches wide.
- (3). No door shall open immediately upon a flight of stairs, but a landing at least the width of the door, shall be provided between such stairs and such door.

Section 192—Stairway Enclosures

(1). All entrance stairways for the use of the audience (excepting those leading to the first gallery only, which may be open on one side) shall be enclosed with walls of brick or other fireproof materials in the stories through which they pass. There shall be no communication from any portion of the building above the street or court grade to any of said stairway enclosures except from the tier for which the stairway is exclusively intended. No stairway from a gallery shall communicate with the basement or cellar.

Section 193—Emergency Exit Stairways and Balconies

(1). Emergency exit stairways from each gallery shall be placed in smoke-proof towers, or an approved form of open air stairway may be used. The minimum width of emergency exit stairways shall be 4 feet, except that their width may be reduced 15 per cent. if located in a smoke-proof tower having no openings except to an outside balcony and to court grade. The stairways for the emergency exits from each tier shall extend to the court or street grade independently of the stairways or exits from other tiers. Outside balconies shall be at least as wide as the stairways which they serve, but in no case less than 6 feet. No riser shall be nearer than one foot to the door opening.

Section 194—Construction of Balconies and Stairways for Emergency Exits

(1). All emergency exit balconies and stairways shall be constructed of steel or of other forms of incombustible construction approved by the Building Inspector. Risers, treads, platforms and balconies must be solid, without slats, and the construction shall be of strength sufficient to sustain safely a live load of 100 pounds per square foot with a safety factor of 4. Exterior stairways and balconies of steel construction, shall be designed in conformity with the requirements of paragraph 2, Section 41. Sheet metal or other suitable solid material shall be provided to a height of not less than 4 feet on the outer side of all such open air stairways, balconies and platforms, and they shall be covered with a metal hood or awning constructed in a manner approved by the Building Inspector. There shall be no openings in any theatre wall between the outside balconies or stairways and their covers, except the required exits from the tier served by said stairways and balconies. No person of the audience shall be obliged to pass alongside of more than one exit doorway after reaching an outside balcony to get to the ground. All exit stairways and balconies shall be kept free of obstruction of every kind.

Section 195—Treads and Risers

(1). All stairs shall have treads of uniform width, and risers of uniform height in each flight. The risers shall not exceed $7\frac{3}{4}$ inches in height nor shall the treads, exclusive of nosing, be less than $9\frac{1}{2}$ inches wide. No circular stairs shall be permitted, and no winders shall be introduced in any stairs which may be used for exit purposes.

Section 196—Exits from Stage Section

(1). At least two independent exterior exits with direct outlet at court or street grade shall be provided from the stage level for the service of the stage and floors below same. These exits shall be at opposite sides of the stage and may serve also as entrances. Each tier of dressing rooms shall have an independent emergency leading directly to an open air stairway, or to a court or street. No ladder fire escapes shall be permitted. The fly galleries shall be provided with adequate means of exit. All exits from the stage section shall be independent of the exits for the audience above the court or street grade. Stairways, if any, leading down from stage level shall be enclosed and protected by fireproof doors.

Section 197—Emergency Courts

(1). There shall be reserved for emergency exit purposes an open court or space on the side or sides of the building as follows:

(a) In the case of a plot with streets on front, rear, and both sides, or in the case of a double corner plot where both sides of the theatre border on streets, no courts will be required. On a double corner, single corner, or inside plot when one side only of the building borders on a street, one court will be required located on the opposite side. On an inside plot where only the building front borders on the street, courts shall be provided on both sides.

(b) In buildings used for motion picture shows and having no stage, the exits and courts above required may be replaced by equivalent exits and courts at the rear if consistent with the adequate distribution of the entire entrance and exit facilities.

(2). The minimum width of open courts shall be 8 feet when the total capacity is 750 or less; 10 feet when the capacity is between 750 and 1000; and when the capacity exceeds 1000 people the width of the courts

shall be increased one foot for each additional 500 people or fraction thereof in excess of 1000.

Section 198—Court Length

(1). Said open court or courts shall extend at least from the line of the proscenium wall the length of the auditorium to the wall separating the same from the entrance lobby or vestibule. This entire court area shall be open to the sky, except that emergency exit stairways and smoke-proof towers may occupy part of the court space if the required width of exit passageways is not obstructed.

Section 199—Court Corridors

(1). Where said emergency courts do not open directly on a street a separate and distinct corridor or passage shall continue directly to the street, around the building or through such structure as may be or may have been built on the street, but no such passageway shall pass under any portion of the auditorium or stage. Said corridors or passages shall be constructed fireproof all the way to the street in same manner as provided for the construction of corridors for entrances, in Section 184, paragraph 3. The corridor or passage leading from the court to the street shall be at least as wide as the court, and there shall be no projections into the passage. The outer openings may be provided with doors or gates opening outward. During the performance these doors or gates shall be kept open; at other times they may be closed and fastened by movable bolts.

Section 200—Entrances in Courts

(1). If entrances open on emergency courts or corridors the said courts or corridors shall be increased in width an amount at least equal to the width of the entrances which they serve.

Entrance vestibules to stage section, Sec. 209.

Section 196—Courts and Corridors Kept Clear

(1). The courts and corridors or passages shall not be used for storage purposes, nor for any purpose whatsoever except for exit and entrance, and must be kept free and clear during performances.

Section 202—Gradients

(1). All courts and corridors at points of street entrance or exit shall be flush with sidewalk. To overcome any difference of level in and between courts, corridors, lobbies, passages and aisles on the ground floor, gradients shall be employed of not over one foot in 10 feet, except that runs of not more than 10 feet in length may be one in eight.

Section 203—Proscenium Wall

(1). A fire wall built of brick or concrete not less than 12 inches thick in any portion shall separate the auditorium from the stage and shall extend at least 4 feet above the stage roof, or the auditorium roof if the latter be higher. Any windows in the structure above the auditorium which face over roof of stage section when within 100 ft. of stage roof must be protected with fire shutters or fire windows. Above the proscenium opening there shall be a girder or other support of sufficient strength to safely carry the load. If a girder be used it shall be protected against fire by at least 4 inches of fireproof material with special provision to reinforce or support it.

Section 204—Proscenium Curtain

(1). The proscenium opening shall be provided with a rigid fireproof curtain, built in conformity with the following specifications, or their equivalent in efficiency when approved by the Building Inspector.

(2). The curtain shall have a rigid, rivet-jointed, steel framework. The front or audience side of the frame shall be covered with sheet steel of a thickness not less than No 20 U. S. gauge. The back shall be covered with vitrified cellular asbestos boards at least 1 inch thick, or other material equally fire resisting. Both coverings shall be securely attached to the framework and the joints properly sealed. The curtain shall be designed to resist a wind pressure of 10 pounds per square foot of surface without flexure sufficient to interfere with its closing.

(3). The thickness of the curtain shall be not less than 3 inches where the width of the proscenium wall opening is 30 feet or less; curtains for larger openings shall increase in thickness in proportion to the increase in width of opening they cover.

(4). An asbestos roll of a diameter not less than one-half the thickness of the curtain, shall be securely attached to the bottom of the curtain to form a smoke seal between the curtain and the stage floor.

(5). The curtain shall overlap the proscenium wall opening at least 12 inches at each side of the opening and not less than 2 feet at the top.

(6). The guide members at the sides shall be rolled steel shapes, none of which shall be less than $\frac{3}{8}$ inch thick, and shall be of such character as to form a continuous smoke seal from top to bottom, with a clearance of not over $\frac{3}{8}$ inch. The guides shall be installed in such manner that in case of fire on the stage the pressure of heated gasses against the curtain will act to close the guide joints tightly. Provision shall be made to prevent the curtain from getting out of the guiding channel into which it shall project at least 2 inches. The proscenium wall shall have an offset at each side of the opening, so located and of such thickness and height as to be suitable for the attachment of the curtain guides. At least 1 inch shall be allowed at each edge of curtain to provide for lateral expansion.

Opportunity for expansion of the unprotected structural framework of the curtain and guides shall be furnished by slotting the holes of the connecting bolts.

(7). The wall over the proscenium opening shall be smooth and plumb to approximately the top of the curtain when it is down, and shall then offset at least 4 inches for the rest of its height, thus leaving a bench along the line of the top of the curtain between which a smoke seal shall be formed. Such a seal may conveniently be provided by arranging for the edge of a rolled steel shape attached to the curtain to dip into a trough of sand resting on the bench.

(8). No part of a curtain or any of the curtain guides shall be supported by, or fastened to, any combustible material.

(9). The hoisting apparatus for the curtain shall be designed with a factor of safety of 8.

(10). The points for curtain suspension shall always be an even number, but never less than four. Two of the suspension points shall be located at the extreme ends of the curtain, and the others may be placed at such points as best suit the design, but in no case shall the distance between any two points of support exceed 10 feet.

(11). Half of the cables attached to these points shall lead to one set of counterweights and half to another. The curtain shall be operated by hydraulic or other mechanism approved by the Building Inspector. If hydraulic mechanism is used, the water may be taken from either the house tank or sprinkler tank supply. If from the latter, the supply pipe for curtain mechanism shall be so located in the tank that it cannot reduce the quantity of water below the amount necessary to fulfill the sprinkler requirements.

(12). The device for controlling the curtain shall be simple in design, and capable of convenient operation from both sides of the stage and from the tie galleries.

(13). The drop speed of the curtain shall be uniform and not less than 1 foot per second, but when the curtain is about 2½ feet from the stage it shall automatically slow down so as to settle on the stage without shock. In addition to the regular operating mechanism, there shall be an emergency device which will cut off the power and allow the curtain to drop by gravity. This device shall be so arranged that it can be easily operated by hand from each side of the stage, under the stage, and in the tie galleries. The device shall also be so designed that its operation will be controlled by fusible links located at each of the above named points.

(14). The audience side of the curtain may be decorated with a paint in which no oil is used. No combustible material shall be applied or attached to the curtain.

(15). Drawings for every such curtain shall be submitted to the Building Inspector, and be approved by him before it is erected.

Section 205—Counterweights

(1). Where counterweights are used they shall be suspended at the extreme side or other walls of the stage section, and be enclosed by guards.

Section 206—Other Openings in Proscenium Wall

(1). Openings between the stage and auditorium other than the proscenium opening shall not exceed four in number; two at the approximate stage level and two in the musicians' pit; the size of any such opening shall not exceed 21 square feet. The openings at stage level shall have an automatic fire door on one side of the wall and self-closing fire door on the other side of the wall; openings, if any, below the stage shall have a self-closing fire door; all of said doors shall be hung so as to be opened from either side of the wall at all times.

Section 207—Overhang of Stage

(1). All that portion of the stage extending from the stage inside of the curtain and from the wall separating the space under the stage from the auditorium, to the outer edge of the apron shall be fireproof. A wood finish floor without air space may be used on the stage in front of the curtain.

Section 208—Openings in Exterior Walls

(1). All openings in exterior walls of stage section shall be protected by approved fire doors, shutters, or windows.

Section 209—Vestibules for Stage Entrances

(1). All entrances to the stage from streets, alleys, or open courts shall be vestibuled to protect the stage from drafts of air.

Section 210—Fireproof Stage Construction

(1). All that portion of the stage which is not movable (excepting that part usually embraced between the proscenium jambs and from proscenium to rear wall) shall be of fireproof construction and designed to safely sustain a live load of not less than 100 pounds per square foot. The non-fireproof portion of stage floor shall be of heavy timbers or steel beam construction with flooring not less than 1¾ inch finished thickness.

Section 211—Fly and Tie Galleries

(1). The fly galleries and the tie galleries shall be of fireproof construction designed to safely sustain a live load of 90 pounds per square foot. No wooden boards or sleepers shall be used as a covering over these floors.

Section 212—Gridiron

(1). The gridiron or rigging loft shall have a lattice metal floor capable of sustaining a live load of 75 pounds per square foot and be readily accessible by metal stairs or ladder.

Section 213—Scenery

(1). All stage scenery, curtains, and decorations made of combustible material, and all woodwork on or about the stage, shall be painted or saturated with some non-combustible material, or otherwise rendered safe against fire.

Section 214—Ventilation in Stage Section

(1). There shall be one or more ventilators, constructed of metal or other combustible material, near the center and above the highest part of the stage of every theatre, raised above the stage roof, and of a combined sectional area equal to at least 10 per cent. of the floor area within the stage walls. The openings in such ventilators shall have an aggregate sectional area at least equal to that required for the ventilators. Detailed drawings showing the construction and operation of the ventilators must be approved by the Building Inspector before installation is begun. The entire equipment shall conform to the following requirements or their equivalent:—

(2). The construction of the cover and its operating mechanism shall be massive, and the cover shall open by force of gravity sufficient to effectively overcome the effects of neglect, rust, dirt, frost, snow or expansion by heat, or warping of the framework.

(3). Glass if used in ventilators must be protected against falling on the stage. A wire screen if used under the glass must be so placed that if clogged it cannot reduce the required vent area or interfere with the operating mechanism, or obstruct the distribution of water from the automatic sprinklers.

The cover shall be arranged to open instantly after the outbreak of fire by the use of approved automatic fusible links of the thinnest metal practicable; manual control also must be provided by a cord run down to the stage at a point designated by the Building Inspector.

(5). The link and cord must hold the cover closed against a force of at least 30 pounds excess counterweight tending to open the cover. Fusible links shall be placed in the ventilator above the roof line and in at least two other points in each controlling cord. No automatic sprinkler heads shall be placed in the ventilator space above the fusible links. While theatre is in use, each ventilator cover shall be operated daily by one of the cords.

Section 215—Skylights

(1). If any skylight is placed in a roof, it shall be installed in accordance with the requirements of Section 76.

Section 216—Dressing Rooms

(1). Actors' dressing rooms shall not be placed on or under the stage, or in or under the auditorium. They shall be in a separate section provided for that purpose. No dressing room ceiling shall be less than 4 feet, 6 inches above the level of street or court adjoining.

(2). The walls separating the section containing the dressing rooms from the stage or auditorium, shall be of brick or concrete not less than 8 inches in thickness and each opening therein shall be protected with a self-closing fire door. The partitions dividing the dressing rooms, together with the partitions of every passageway from the same to the stage shall be constructed of approved fireproof material not less than 4 inches in thickness. All doorways in any of said partitions shall be pro-

tected by self-closing fire doors. All dressing rooms shall be ventilated by fire windows to a street or to a court not less than 24 square feet in area.

(3). All shelving and cupboards in every dressing room, property room or other storage rooms, shall be of incombustible material.

Section 217—Heating Apparatus

(1). Steam boilers shall be located outside of the buildings, either under the sidewalk or in an extension, but in no case under or within any portion of the building; the space allotted to the same shall be enclosed by walls of brick or concrete at least 12 inches thick on all sides, and the ceiling of such space shall be constructed of fireproof materials. Each doorway in said walls connecting with the building shall have an automatic fire door.

(2). No floor register for heating, ventilating or other purposes shall be permitted in aisles, corridors or passageways.

(3). All blowers used to circulate air through heating or ventilating pipes with openings to the auditorium shall be provided with a device to stop the blower automatically in case of fire. The device for this purpose shall be located near the blower, both inside and outside the pipe leading to openings in the auditorium.

(4). No coil, radiator or pipe shall be placed so as to obstruct any aisle or passageway. Any exposed radiator or coil shall be guarded.

Section 218—Lighting

(1). The stage section and every portion of the building devoted to the uses or accommodation of the public, also all passages leading to streets, including the open courts and corridors, shall be satisfactorily lighted during every performance, and until the entire audience has left the premises.

(2). Only electric light shall be used in the auditorium and stage section, except that gas fixtures having not larger than "1 foot" burners may be used in dressing rooms. These shall have soldered to the fixture strong wire guards or screens not less than 10 inches in diameter, so constructed that any material in contact therewith shall be out of reach of the flames.

(3). Where electric current from two separate street mains is available, two separate and distinct services must be installed; one service to be of sufficient capacity to supply current for the entire equipment of the theatre, while the other service must be at least sufficient to supply current for all emergency lights, including the exit lights or signs, and all lights in outside courts, lobbies, stairways, corridors, and other portions of the theatre which are normally kept lighted during the performance. Where only one supply from a street main is available the connection used exclusively for emergency lights must be taken from a point on the street side of the main service fuses. When the source of supply is an isolated plant on the same premises, an auxiliary service at least sufficient to supply all emergency lights shall be connected with some outside source, or a suitable storage battery within the premises may be considered the equivalent of such service.

(4). Where illuminated signs are not provided there shall be at least one green light over each exit and entrance opening from the auditorium and stage sections.

(5). All emergency lights shall be controlled by a special switch located in the lobby and accessible only to authorized persons.

(6). The stage switchboard shall have a metal hood over the top, running the full length of the board and fully protecting same from anything falling from above.

Section 219—Standpipes

(1). Standpipes conforming to the requirements in Section 181 shall be provided with hose connections located as follows: One on each side of the stage on each tier, one readily accessible from the property room, the carpenter shop, scenery storage rooms, lobbies and elsewhere as may be required by the Building Inspector.

(2). A sufficient quantity of approved linen hose, 1½ inches in diameter, in 50-foot lengths or enough to cover floor area, shall be kept attached to each hose connection; 25-foot lengths will be permitted in fly galleries.

On each side of the stage, under the stage, on each fly gallery, also in property and other store rooms, and in each workshop, there shall be kept in readiness for immediate use one approved 2½ gallon hand chemical fire extinguisher and one 40 gallon cask filled with water, and six fire pails; said casks and buckets shall be painted red and lettered "For Fire Purposes Only." There shall also be provided at least three approved 2½ gallon hand chemical fire extinguishers for each tier of the auditorium.

(3). All apparatus for the extinguishment of fire shall be installed in accordance with the rules of the Fire Department and be kept at all times in condition satisfactory to and under control of the Fire Department.

PART XXX**CONSTRUCTION OF MOVING PICTURE THEATRES HAVING CAPACITY OF THREE HUNDRED OR LESS****Section 220—Requirements for Exhibition Room**

(1). No motion picture machine shall be installed, maintained or operated in any building that does not abut directly upon a street; nor shall any such machine be installed, maintained or operated in connection with any exhibition room contained in a building occupied as a hotel, tenement house, or lodging house; nor in factories or workshop, except where the exhibition room and motion picture machine are separated from the rest of the building by unpierced fireproof walls and floors; in no case shall the main floor of such exhibition room be more than 4 feet above or below the adjoining grade level. To overcome any difference of level on the ground floor gradients shall be employed of not over one foot in 10 feet; no steps shall be permitted. Exit doors shall be at the same level as the sidewalk.

(2). If the walls of the auditorium contain wooden studs, they shall be protected with metal lath and not less than ¾ inch of cement or cement-tempered plaster, or be covered with ½ inch plaster boards and plastered with ¼ inch of plaster, or covered with metal. The joints shall be properly filled with mortar. The ceilings of all such auditoriums having wooden construction, and the ceilings of any basement or cellar which may exist under such auditoriums, shall be protected with metal lath and cement plaster or with ½ inch plaster board and covered with plaster or metal as above specified for protection of walls. All metal lath used in such construction shall be of quality specified in Section 102.

(3). All motion picture exhibition rooms shall be provided with at least two separate exits, one of which shall be in the front and the other in the rear, both leading to unobstructed outlets on the street. The aggregate width in feet of such exits shall be not less than one-twentieth of the number of persons to be accommodated thereby. No exits shall be less than 5 feet in width, and there shall be a main exit not less than 10 feet in total width.

(4). If an unobstructed exit to a street cannot be provided at the rear of such buildings, as herein specified, either an open court or a fireproof

passage or corridor shall be provided from rear exit to the street front, of at least 4 feet in width for exhibition rooms accommodating fifty persons or less, and 6 inches additional for each additional fifty persons accommodated by such room. Such passage shall be constructed of fireproof material and shall be at least 10 feet high in the clear. The walls forming such passage shall be at least 8 inches thick, of brick or other approved fireproof material, and if there be a basement the wall on the auditorium side shall either run 1 foot below the cellar bottom or may be carried in the cellar on iron columns and girders properly fireproofed. The ceiling of said passages, and, if there be a basement, the floor, shall be of fireproof construction.

(5). If unobstructed rear exit or exits to a street are provided, the said exit or exits shall be of the same total width required for the court or passage above mentioned. Said passages and exits to the street shall be used for no other purposes except for exit and entrance, and shall be kept free and clear.

(6). The level of the open court or passage where it intersects the street shall be not greater than one step above the level of the sidewalk, and the grade shall be not more than 1 foot in 10, with no perpendicular rises.

(7). All seats in any exhibition room for moving picture machines shall be not less than 32 inches from back to back, measured horizontally, and securely fastened to the floor; they shall be so arranged that there will be not more than ten seats in a line between aisles, nor more than four between any seat and an aisle. All aisles shall lead directly to exits and all exits shall be directly accessible to aisles. No aisle shall be less than 3 feet in width where it begins, and shall increase in width toward the exits 3 inches for every 10 feet in length. All exit doors shall be arranged to swing outward and be provided with fastenings that can be opened readily from the inside, without the use of keys or any special effort. Such doors shall not be locked when the room is open to the public.

(8). All the requirements of this section relating to seats, aisles, passageways, exits and doors shall apply in connection with each open-air motion picture exhibition.

(9). Every exit doorway leading from exhibition room shall have over the same on the auditorium side, the word "EXIT" in letters not less than 6 inches high, or in illuminated sign with letters of the same height. Where illuminated signs are not provided there shall be at least one green light over each exit doorway. The exit doorways shall be numbered with figures not less than 6 inches high. Light used in marking exits or lighting passageways, stairways or inclines leading from them shall not depend upon or be controlled by wires, switches or fuses located in room, compartment, booth or enclosure containing motion picture machines, but shall be controlled from ticket office.

(10). Any motion picture exhibition room accommodating more than 300 people, or containing a gallery or galleries, shall be built in compliance with the requirements for theatres, Sections 183 to 220, inclusive.

PART XXXI

ASSEMBLY HALLS

Section 221—Requirements for Public Safety

(1). In all buildings or parts of buildings, occupied for purposes of assembly, other than theatres, which are provided for in Sections 183 to 220 inclusive, the halls, doors, stairways, passageways, and all other exit facilities shall conform to the provisions of this Code as provided for in Sections 40 to 44, inclusive.

(2). All seats shall be spaced as required for theatres. In comput-

ing the seating capacity of any room or building used for purposes of assembly in which the seats are not fixed, an allowance of six square feet of floor area shall be made for each person and all space between the walls or partitions of such room or building shall be measured in this computation. Movable seats are not permitted in balconies and galleries having stepped floors.

(3). Any assembly hall containing a stage, shall comply with the requirements for theatres, except that stages the area of which do not exceed one-fifth the area of the auditorium and having no transient scenery other than especially approved by the Building Inspector, may conform to the following requirements: The proscenium wall may be built as required for fireproof partitions, Section 104. All allowed openings in the proscenium wall except the curtain opening shall be protected by approved fire doors. The curtain in such assembly halls may be of asbestos instead of the rigid theatre curtain and shall be hung on incombustible supports. All scenery, borders, and wings shall be rendered non-inflammable as provided in Section 213.

PART XXXII

PLUMBING, DRAINAGE AND ELECTRICAL REQUIREMENTS

amended Section 222—Plumbing and Drainage

(1). The plumbing and drainage of all buildings, both public and private, shall be performed in accordance with the rules and specifications of the Plumbing Code of the City of Miami.

Section 223—Gas, Water and Steam Pipes

(1). Every building, in which gas or steam is used for lighting or heating, shall have each supply pipe leading from the street mains provided with a heavy brass straight-way stopcock or valve placed in the sidewalk at or near the curb, and arranged to permit shutting off at that point.

(2). No gas, water, or other pipes shall be let into wooden beams unless placed within 36 inches of the end of the beams, and in no case shall the pipes be let into any beam more than one-fifth of its depth.

Section 224—Installation of Gas Pipes and Gas Appliances

(1). All outlets and risers shall be left capped until covered by fixtures.

(2). No unions or running threads shall be permitted. Where necessary to cut out for repair of leaks, or making extensions, pipe shall be again put together with right and left couplings.

(3). All gas burners shall be placed at least 3 feet below any woodwork or ceiling attached to wooden beams, unless the same is properly protected by a shield, in which case the distance shall be not less than 18 inches.

(4). No swinging or folding gas bracket shall be placed against or near any stud partition or woodwork.

(5). No gas bracket or any lath and plaster partition or woodwork shall be less than 6 inches in length measured from the burner to the plaster surface or woodwork.

(6). Gaslight placed near window curtains or any other combustible material shall be guarded by globes or wire cages.

(7). Gas connections to stoves and similar heating devices shall be made by rigid metal pipes. For small portable gas heating devices, flexible metal or rubber tubing may be used when there is no valve or other shut-off on the device.

(8). All gas, gasoline, oil, or charcoal burning stoves or heating devices shall be placed on iron stands at least 6 inches above combustible supports, unless the burners are at least 5 inches above the base, with metal guard plates 4 inches below the burners.

(9). No open flame heating or lighting device shall be used in any room where gasoline or other volatile inflammable fluids are stored or handled.

(10). After all piping is installed and all outlets capped, there shall be applied by the plumber in the presence of an inspector of the Department of Buildings, a test with air to a pressure equal to a column of mercury 6 inches in height, and the same to stand for five minutes; only mercury gauge shall be used. No piping shall be covered, nor shall any fixture, gas heater or range be connected thereto until a card showing the approval of this test has been issued by the Building Inspector.

(11). No meter shall be set by any gas company until a certificate is filed with them from the Department of Buildings certifying that the gas pipes and fixtures comply with the foregoing rules.

Section 225—Electrical Installations

(1). All electrical wiring, apparatus, or appliances for furnishing light, heat, or power shall be in accordance with the Electrical Code, of the City of Miami.

PART XXXIII

REGULATIONS GOVERNING THE CONSTRUCTION AND OPERATION OF ELEVATORS

Section 226—Construction and Operation of Elevators

amended
(1). The term elevator as used in this Code shall include all elevators, escalators or lifts used for carrying passengers or freight. The term dumbwaiter shall include such special form of elevator, the dimension of which do not exceed 6 square feet in horizontal section and 4 feet in height, and which is used for the conveyance of small packages and merchandise.

Any hand power elevator having a rise of more than 35 feet shall comply with all the requirements of this section. No belt elevators driven from a countershaft shall be installed for passenger service.

(2). Before any elevator shall hereafter be installed or altered in any building, the owner shall submit, on appropriate blanks furnished therefor, to the Building Inspector an application in triplicate stating the construction and mode of operation of such elevator to be installed or altered, accompanied by such plans and drawings as may be necessary, and shall obtain his approval therefor. Before any such elevator shall be put into service, the same shall have been duly tested and inspected by the Building Inspector and a certificate of inspection and approval obtained. In making any changes or alterations to elevator shafts, rails, overhead machinery or power, all the work changed or altered shall be made to conform to these regulations.

(3). The owner of any elevator now in operation and the manufacturer of any such elevator hereafter placed in any building, shall cause to be fastened in a conspicuous place in said elevator, a metal plate having suitable raised letters on same which shall designate the number of pounds which said elevator shall be permitted to carry, but in no case shall a carrying capacity of less than 100 pounds per square foot of platform area inside the car be permitted on any passenger elevator.

(4). Every elevator, except full automatic push button elevators, shall be in charge of a competent, reliable, operator not less than eighteen years of age, who shall have had at least one week's experience in running an elevator under the constant supervision of a person who has received a certificate of competency as an elevator operator.

(5). No person shall run any passenger or freight elevator in the

city of Miami unless he shall first register at the office of the Department of Buildings his name and residence, also the location of the building in which he is to perform such service, and shall first receive from the Building Inspector a certificate of competency.

(6). Not more than one door opening in the elevator shaft shall be allowed on each floor, and all openings in the several stories shall be one above the other, except where the operating device of the elevator is so placed that the operator can readily control all doors without leaving the car control, in which case more than one door opening may be permitted on a floor.

(7). All elevators hereafter installed in vertical shafts shall be controlled by some mechanical device that will automatically prevent the car being moved until the shaft door or gate at which the car is standing is shut and securely fastened, and which will prevent the opening of any shaft being moved until the shaft door or gate at which the car is standing is gates opening into existing elevator shafts shall be locked or bolted in manner to permit opening only by the operator of the car.

(8). All counterweights shall have their sections strongly bolted together. There shall be not less than 3 feet clearance between the top of counterweights and the under side of overhead beams when the car is resting on the bumpers. No continuous forged straps shall be permitted on counterweights.

(9). Elevator cars shall be constructed of incombustible materials, except that flooring may be of hardwood. There shall be not more than 1¼ inches space between the floor of the car and the floor saddles, and where the saddles project into the shaft the same shall be properly beveled on the under side. The under side of the car shall be of incombustible materials. Cars for all elevators shall be properly lighted.

(10). All guide rails for both car and counterweights shall be of steel, and shall be bolted to the sides of the shaft with steel or cast-iron brackets, so spaced that the guide rails will be rigid. The splices in the rails shall be located as near such rigid supports as possible.

(11). No passenger elevator shall be permitted to have a freight compartment attached to it in any manner.

(12). Immediately under the sheaves at the top of every elevator shaft in any building, there shall be provided a concrete slab or substantial grating of steel having not more than one inch space between the members of said grating, and of such construction as shall be approved by the Building Inspector.

(13). A clear space of not less than 3 feet shall be provided between the bottom of the shaft and the lowest point of the under side of the car floor when the car is at its lowest landing; and between the top of the crosshead of the car and the under side of the overhead grating when the car is at its top landing; except that this latter space shall be not less than 5 feet for elevators having a speed in excess of 350 feet per minute, and may be reduced to 2 feet for elevators having a total rise not exceeding 30 feet and a speed not exceeding 100 feet per minute.

(14). All parts of the elevator machinery shall be enclosed by suitable partitions of incombustible materials, and such inclosures shall be lighted. Free and safe access shall be provided to all parts of elevator machinery. Where the machine is located at the bottom of the shaft it shall be protected with a substantial pit pan.

(15). At the top and bottom of all elevator shafts there shall be placed substantial buffer springs for car and counterweights.

(16). The carrying beams and other supports for all machinery shall be of steel designed for double the live loads to be supported.

(17). Every passenger elevator shall have a trap door in the top of the car of such size as to afford easy egress for passengers, or where two

cars are in the same shaft such means of egress may be provided in the side of each car.

(18). The Building Inspector shall cause an inspection of elevators carrying passengers or employes to be made at least once every three months, and shall require any necessary repairs to be made promptly by the owner. If the Building Inspector at any time considers an elevator to be unsafe, he may require its operation to cease until such repairs or alterations have been made as will in his judgment produce safety. In lieu of such inspection by his own Department, the Building Inspector may accept the report of inspections made by other reliable and properly constituted authorities which in his judgment are competent and satisfactory.

(19). In every building exceeding 100 feet in height, at least one passenger elevator shall be kept in readiness for immediate use by the fire department during all hours of the night and day, including holidays and Sundays.

(20). It shall be unlawful to use any elevator that is not provided with safety devices for bringing the elevator car to rest without serious injury to passengers or operators whenever it may for any reason exceed its rated speed by more than forty per cent, or reach a speed of 850 feet per minute. Safety devices are not required upon the plunger type of elevators, nor upon sidewalk elevators which travel less than 30 feet.

(21). The Building Inspector shall issue and enforce such other regulations regarding the construction, erection, operation or repair of elevators as he may consider necessary to insure safety. Such regulations being promulgated in accordance with the requirements of Section 240.

Enclosures for elevators, Sec. 80.

PART XXXIV

SIGNS AND BILLBOARDS

Section 227—Signs and Billboards

Wooden signs or billboards may be permitted as follows:

(a) When not exceeding 13 feet in height above the curb level, with a clear space of not less than 3 feet between the bottom of the sign or billboard and the ground. Such signs or billboards shall be securely attached to posts or other supporting structures and shall be located entirely within the lot lines.

(b) When not exceeding 2 feet in height and fastened flat against the wall of a building, or in front of or on top of the cornice over a first story show window, or on top of a wall of the building.

(c) When exceeding 2 feet in height but not exceeding 40 square feet in area and fastened flat against the wall of a building.

(d) All signs attached to a building shall be fastened directly to the walls by well secured metal anchors, nor shall such wooden signs have electric lights or fixtures attached to them in any manner.

Wooden supports or braces shall not be permitted.

(2). All other signs or billboards within the fire limits shall be entirely constructed of incombustible materials, including all supports and braces for same.

(3). Any letter, word, model, sign, device or representation in the nature of an advertisement, announcement or direction, supported or attached wholly or in part over or above any wall, building or structure, shall be deemed to be a sky-sign. Except as herein specified sky-signs shall be constructed entirely of metal, including the supports and braces for same, and no sky-sign shall project beyond the building line.

(4). Within the fire limits no sky-sign shall be supported, anchored or braced to the wooden beams or other frame-work of a building which is over three stories high.

(5). No sign attached to the side of a building or structure fronting upon a public thoroughfare, shall project more than 5 feet outside the building line.

(6). Sky-signs shall be set back at least 8 feet from the cornice or wall on a street front, shall not project more than 25 feet above the roof of a building, and shall have a space at least 6 feet in height between the bottom of the sign and the roof.

All such signs shall be designed to withstand a wind pressure of at least 30 pounds per square foot of surface.

(7). No sign or billboard shall be so constructed as to obstruct any door, window or fire-escape, on any building.

(8). Before the erection of any sign or billboard shall have been commenced, a permit for the erection of the same shall be obtained from the Building Inspector. Each application for the erection of any sign or billboard shall be accompanied by a written consent of the owner or owners, or the lessee or lessees of the property on which it is to be erected.

(9). This section shall apply to all signs hereafter erected whether placed upon new or existing buildings.

PART XXXV

PROTECTION OF WORKMEN AND THE PUBLIC

Section 228—Provision for Safety

(1). Fireproof floor construction shall follow up the erection of the steel framing of all structures within two complete tiers.

(2). If filling with brick or other fireproof material is not required between floor beams, the under flooring or other planking shall be laid in each story as the building progresses.

(3). If the floor construction is of structural steel, the contractor for the steel work or the owner of building in course of erection shall thoroughly plank the entire tier of steel beams on which the structural steel work is being erected, except such spaces as may be reasonably required for hoisting materials and other erection work.

(4). All openings in the floor framing intended for stairways, elevators or for other shafts shall be planked over or enclosed on all sides to a height of at least 3 feet.

(5). If elevating or hoisting apparatus is used for the purpose of lifting materials within a building under construction, the shafts or openings in each floor shall be inclosed or fenced by a substantial barrier at least 6 feet high, except two sides for the handling of materials. These sides shall be guarded by an adjustable barrier not less than 3 feet high above the floor and not less than 2 feet from the edge of such shaft or opening.

Section 229—Overloading to be Avoided

(1). During the construction or alteration of any building or structure no material entering into such construction or alteration shall be placed on any floor in excess of the live load that such floor is intended to safely sustain.

Section 230—Shed for Protection of Pedestrians

(1). When buildings or any part thereof are erected or increased in height to over 40 feet upon or along any street, the person erecting or altering such building shall erect and maintain an approved substantial shed from the area line to the curb for the full frontage of the building. No shed shall be required when a building is erected 10 feet or more back of the building line. The street side shall be kept open for a height of not less than 6 feet above the curb, and the shed shall be kept properly lighted at night.

Section 231—Class of Construction Required

(1). **Fireproof Tenements.** Every building erected or altered for use as a tenement house exceeding 2 stories in height, shall be constructed fireproof in accordance with the requirements of this Code for fireproof buildings.

Requirements for fireproof buildings, Sec. 99.

Section 232—Buildings Converted or Altered

(1). A building not a tenement house, if converted or altered to such use, shall thereupon become subject to all the provisions of this Code affecting tenement houses hereafter erected.

(2). No tenement house shall at any time be altered so as to be in violation of any provision of this Code. If any tenement house or any part thereof is occupied by more families than provided in this ordinance, or is erected, altered or occupied contrary to law, such tenement house shall be considered an unlawful structure, and the Building Inspector may cause such building to be vacated. Such building shall not again be occupied until it or its occupation, as the case may be, conforms to the law.

Section 233—Certificate of Compliance

(1). No building constructed as or altered into a tenement house shall be occupied in whole or in part for human habitation until the issuance of a certificate by the Building Inspector that said building conforms in all respects to the requirements of this ordinance. Such certificate shall be issued within ten days after written application therefor, provided said building at the date of such application shall be entitled thereto. Such a certificate, or the record in the Department of Buildings that such a certificate has been issued by the head of such department may be relied upon by every person who in good faith purchases a tenement house or who in good faith lends money upon the security of mortgage covering a tenement house. Whenever any person has so relied upon such certificate, no claim that such tenement house does not conform in all respects to the provisions of this ordinance shall be made against such person or against the interest of such person in a tenement house to which such a certificate applies or concerning which such a statement has been issued.

(2). The space occupied by outside exit stairways shall not be considered a part of the lot occupied. For the purposes of this section the measurements shall be taken at the ground level, except that where such a building has no basement, and the cellar ceiling is not more than 2 feet above the curb level, the measurements may be taken at the level of the second tier of beams. The provisions of this section shall not apply to a tenement house running through from one street to another street, provided that the lot on which it is situated does not exceed 100 feet in depth.

(3). A pent house, erected on the roof of a fireproof tenement house in which one or more passenger elevators are operated, shall not be considered as affecting the height measurement of the building, provided the pent house complies with the following requirements:

(a) The pent house, including all the bulkheads shall not cover more than 50 per cent. of the area of the main roof.

(b) The pent house shall be set back at least 10 feet from both the front and rear walls of the building, and at least 3 feet from any court wall, and shall have a clear inside height of not less than 9 feet from finished floor to finished ceiling, and shall not exceed 12 feet in height from the highest point of the main roof to the highest point of the pent house roof.

(c) The pent house shall be entirely of fireproof construction.

(d) The pent house shall not be used or rented as apartments, but

its use shall be limited solely to laundry and store room purposes, and to servants' and janitors' quarters.

Section 234—Courts

(1). No court of a tenement house shall be covered by a roof or skylight, but every such court shall be at every point open from the ground to the sky unobstructed, except by an outside exit stairway.

Section 235—Outer Courts

(1). Where one side of an outer court is situated on the lot line, the width of the said court, measured from the lot line to the opposite wall of the building, for tenement houses not exceeding 60 feet in height, shall be not less than 6 feet in any part; for every 12 feet of increase or fraction thereof in height of the said building, such width shall be increased 6 inches throughout the entire height of said court.

Section 236—Public Hallways, Construction of

(1). All stair hallways and hallways connecting with elevator shafts in tenement houses, shall be enclosed and constructed as specified in Section 104; such partitions in non-fireproof tenements shall be constructed as required in Section 105. There shall be no wood or other inflammable material of any kind in such hallways. The floors of all such hallways shall be of fireproof construction. No wooden flooring or sleepers shall be permitted.

(2). There shall be no transom or sash opening of any kind from such stair hallway to any other part of the house.

Section 237—Stairways

(1). In every tenement house all stairways shall extend from the entrance floor to the roof, and the stairs shall be at least 44 inches wide in the clear. Each apartment in every story shall have direct access to such stairways.

(2). Each stairway shall have an exit to the street at the street level, or to a court or yard which connects directly with the street.

(3). In non-fireproof tenement houses no closet of any kind shall be constructed under any stairway leading from the entrance story to the upper stories, but such space shall be left entirely open and free from incumbrance.

Section 238—Storage of Dangerous or Combustible Materials Prohibited in Tenements

(1). No part of any tenement house, nor of the lot upon which it is situated, shall be used as a place of storage, or handling of any article dangerous or detrimental to life or health, nor for the storage, or handling of feed, hay, straw, excelsior, lumber, cotton, paper, feathers, rags or other inflammable material. This section applies to existing tenements and those hereafter erected.

Section 239—Dangerous Business

(1). No bakery or place of business in which fat is boiled, shall be maintained in any tenement house which is not fireproof throughout, unless the ceiling, sidewalls, and all exposed iron or wooden girders or columns within the said bakery or within said place where fat boiling is done, are made safe by fireproof materials around the same. There shall be no openings either by door or window, dumbwaiter shafts or otherwise, between said bakery or other parts of the building; except that in bakeries in which no fat is boiled, and in which no apparatus for fat boiling is present, a dumbwaiter communicating between the place where the baking is done

and the store above may be maintained, if entirely inclosed in a brick shaft with walls not less than 8 inches thick, without any openings whatever except one door opening in the bake-shop and one door opening in the bakery store; such openings shall each be provided with a fire door so arranged that when one door is open or partly open, the other door shall be entirely closed.

Section 240—General Powers and Duties of the Building Inspector

(1). The Building Inspector shall be a ^{appointed by the Mayor} competent architect, engineer, or builder of at least 10 years' practical experience. He shall have the power, and it shall be his duty to enforce the provisions of this Code; to approve or disapprove within a reasonable time, applications, plans, detail drawings, and amendments thereto; to issue permits, notices, and certificates; to make rules and specifications to assist in the proper application of this Code, or providing for necessary additional regulations covering details of special construction to pass upon questions relative to the mode, manner of construction, or materials to be used in the erection or alteration of a building; to require that such mode, manner of construction, or materials, shall conform to the true intent and meaning of the several provisions of this Code; to authorize the City Attorney subject to approval of the mayor to institute any and all actions that may seem proper or necessary for the enforcement of its provisions.

(2). The Building Inspector shall not have power to vary or modify any provisions of this Code, or of any existing law or ordinance relating to the construction, alteration or removal of any buildings or structures erected or to be erected within his jurisdiction.

(3). Where there are practical difficulties in the way of executing the strict letter of the law, so that the spirit of the law shall be observed and public safety secured and substantial justice done, a written application shall be filed by the owner of such building or structure or by his duly authorized agent, addressed to the Building Inspector, setting forth the grounds for the desired variation or modification, and requesting permission that he or his representatives may appear before the Building Inspector and be heard. The Building Inspector shall fix a date within a reasonable time for a hearing, upon such application, and shall, as soon as practicable, render a decision thereon, which decision shall be final ~~except~~ for appeal to the Board of Examiners as provided in Section 241.

(4). The particulars of each such application and of the decision thereon, shall be entered upon the records of the Building Inspector and if the application is granted, a certificate thereon, together with a statement for the reason for such decision shall be issued by the Building Inspector. A record of all such modifications shall be kept in the office of the Building Inspector properly indexed under section numbers of this Code and shall be open to public inspection.

(5). The Building Inspector shall establish specifications for all tests, also specifications for the quality of materials and appliances or methods of construction not otherwise covered by this Code. Such specifications shall give the details for the conduct of such tests and the necessary requirements to secure approval of same. They shall be filed in the office of the Building Inspector and be published as soon thereafter as possible in the manner provided in paragraph 2 of this section. A public record of all approved material and construction shall be kept in the office of the Building Inspector. Such record shall state by whom the approval is granted, and give a clear statement of the evidence upon which its fitness for approval was based.

(6). During the month of January of each year, the Building Inspector shall prepare a complete list of all materials, appliances or methods of construction which have passed the required tests prescribed by this Code, or have been approved by other rules of the Department, and the necessary

*and approved by City Council
appointed by the Mayor
city council or a committee appointed by President of Council*

city council

keac

information as to the conditions under which said materials, appliances or methods of construction were tested and approved. Said list shall be filed in the office of the Building Inspector not later than the first week in February and be published in the manner provided in paragraph 2 of this section.

Definition of "approved", Sec. 5.

(7). No new material, appliances, or methods of construction shall be employed in any building until they have met the test requirements of the Building Inspector and been approved by him.

(8). The Building Inspector shall have the power to appoint, subject to the approval of the city council, a chief inspector, and such other inspectors or subordinates as may be provided for in the City Charter, and as in his judgment may be necessary to enforce the rules of the Department and the provisions of this Code. The chief inspector shall be a competent architect, engineer or builder of at least ten years' practice. Other inspectors shall be competent men, either architects, engineers, or skilled artisans who shall have had at least five years' experience. It shall not be lawful for any officer or employee in the Department of Buildings to be engaged in business as an architect, engineer, carpenter, plumber, iron worker, mason or builder, while holding office in the Department, or to be engaged in the manufacture or sale of articles entering into the construction of buildings, or act as agent for sale of such articles.

(9). The Building Inspector shall have power to punish any employee, for neglect of duty, violation of rules or disobedience, by forfeiting or withholding pay for a specified time. Subject to the requirements of the civil service law, the Building Inspector shall have power to dismiss any subordinate appointed by him or by any predecessor in office from the service of the Department at any time.

(10). The Building Inspector shall prescribe uniform badges to be worn by him, his inspectors and other employees of the Department of Buildings. All officials and employees of the Department of Buildings, so far as it may be necessary for the performance of their respective duties, shall have the right to enter any building or premises in the city of Miami, Florida, upon exhibiting their badges.

(11). Neither the Building Inspector nor any person appointed, hired or employed by him, when acting in good faith, and without malice, shall be liable for damages by reason of anything done under the provisions of this Code.

Section 241—Appeals

(1). Whenever the Building Inspector shall reject or refuse to approve the mode or manner of construction proposed to be followed, or materials to be used in the erection or alteration of any building or structure, or when it is claimed that the rules and specifications of the Department of Buildings, or the provisions of his Code, do not apply, or that an equally good or more desirable form of construction can be employed in any specific case, the owner of such building or structure, or his duly authorized agent, may appeal from the decision of the Building Inspector, where the amount involved by such decision shall exceed the sum of one thousand dollars.

(2). Such appeal shall be heard by a Board of Examiners consisting of the Chief of the Fire Department and four other competent members, appointed by the mayor, who shall serve, unless removed for cause, during the term of the mayor appointing. The said examiners shall each take the usual oath of office before entering upon the performance of their duties. The mayor shall designate one of said examiners as the presiding officer of said board. At least a majority of affirmative votes shall be necessary to the granting of any petition by said board. No member of said Board of Examiners shall pass upon any question in which he is personally interested. The said board shall meet at any time when requested by the

to city council

Building Inspector

Building Inspector and shall hold at least one meeting annually at which time the Building Inspector shall report to the Board of Examiners any changes he may wish to make in this Code. The clerk of the board shall be appointed, and may be removed by the Mayor, and shall receive a salary of \$50.00 per annum.

The appeal authorized by this section, may be taken within 10 days from the entry of a decision upon the records of the Department of Buildings, by filing with the clerk of the Board of Examiners an application on appropriate blanks furnished by the Board of Examiners, containing the decision of the Building Inspector, the date of entry, the grounds upon which said appeal is taken, and the arguments in support of the request of a reversal of the decision of the Building Inspector by the Board of Examiners.

The Board of Examiners shall thereafter fix a day within a reasonable time for the hearing of such appeal, and upon such hearing the appellant may be represented either in person or by his agent or attorney. The decision of the Board of Examiners, upon such appeal, shall be rendered without unnecessary delay, and such decision shall be final.

PART XXXVI

VIOLATIONS, PENALTIES, AND COURTS HAVING JURISDICTION

Section 242—Removal of Violations

(1). Whenever the Building Inspector has evidence that there exists in any building or structure erected or in course of erection or alteration a violation of any provision of this Code, he may in his discretion, authorize the City Attorney, subject to approval of the Mayor, to institute any appropriate action or proceeding at law or in equity, to restrain, correct, or remove such violation; prevent further work upon the building or structure; require its removal; or prevent the occupation or use of the building or structure.

Section 243—Notice of Violation and Service Thereof

(1). Notices of violation of any provision of this Code shall be issued by the Building Inspector and shall have his name affixed thereto. A Notice of Violation shall be served upon the person charged with the violation or upon the person designated in Section 246, or by any person authorized by said Building Inspector. Such notice shall contain a brief statement of the nature of the violation charged and the penalty or penalties that may be incurred, a brief description of the building or structure and premises to which the notice refers, including its location and a direction to the owner requiring that the violation be removed forthwith. A copy of Section 247 entitled "Duty of Occupant to Notify Owner," shall be printed thereon. If the person charged with the violation, or the person designated in Section 246 cannot be found in the city of Miami after diligent search, then service may be made by affixing the same in a conspicuous place on the property as to which a violation is alleged to exist, or to which such notice may refer, and by depositing in a post office in the city of Miami a copy thereof in a securely closed postpaid wrapper, addressed to him at his last known place of residence, or his last known place of business. If his place of residence or business is not known, and the Building Inspector cannot with reasonable diligence ascertain either, or a place where he would probably receive matter transmitted through the post office, he may dispense with the deposit of any papers, and upon an affidavit thereof the notice of violation shall be deemed served, and the same action or proceeding may be taken thereupon as if he had been personally served.

PART XXXVII

PROCEEDINGS IN CONNECTION WITH UNSAFE OR COLLAPSED BUILDINGS

Section 244—Unsafe Buildings

(1). **Notice to Make Safe.** When it is reported to the Building Inspector that any building or structure or part thereof is unsafe or dangerous, he shall immediately cause an examination of the property to be made. If this examination shows the building or structure or any portion thereof to be unsafe or dangerous, as to the construction, the occupancy or exits, the Building Inspector shall at once serve notice, in the manner prescribed in Section 243, upon the owner or upon the person designated in Section 246. Such notice shall have printed upon it a copy of section 247, and shall contain a description of the building or structure considered unsafe or dangerous, and shall require the same to be made safe and secure, or removed, as may be considered necessary by the Building Inspector; and it shall require the person served therewith to immediately certify in writing to the Building Inspector his consent or refusal to secure, make safe, or remove the building or structure or part thereof. If he immediately certifies in writing his consent to comply therewith he shall be allowed 24 hours following the service of such notice in which to begin to secure, make safe or remove the building or structure. He shall employ sufficient labor and materials, and immediately begin to secure, make safe or remove the same. The work shall be done as speedily as possible and shall be continuously prosecuted to the satisfaction of the Building Inspector.

Application of owner to demolish a building, Section 4.

(2). **Notice of Survey.** Should the person so served with notice neglect or refuse to comply with any of the requirements of said notice to the satisfaction of the Building Inspector, a further notice, which shall have printed upon it a copy of Section 247, shall thereupon be served upon him in the manner heretobefore prescribed. Said notice shall state that a survey of the premises specified therein will be made by a Committee of Surveyors, to be appointed as prescribed in Section 248, at a stated time and place, which time shall be not less than 24 hours nor more than 3 days from the time of service of said notice. But if the owner proceeds to secure, make safe or remove the unsafe or dangerous building or structure, or part thereof, and prosecutes the work in a manner satisfactory to the Building Inspector, the survey may be adjourned or cancelled at his discretion.

(3). **Survey.** Should the Building Inspector consider it necessary, a survey shall be held. The Committee of Surveyors shall attend at the time and place specified, examine the building or structure and immediately report in writing its opinion thereof to the Building Inspector. Should two members of the committee report the building or structure unsafe or dangerous, a copy of their report, with a copy of the notice of survey, shall forthwith be posted in a conspicuous place upon the building or structure. A copy of their report shall also be immediately presented by the Building Inspector to the City Attorney, who shall forthwith apply to the Court for an order, directed to the Building Inspector, commanding him to remove the building or structure or part thereof, or make the same safe and secure.

PART XXXVIII

LEGAL PROCEEDINGS, REPRESENTATIVE OF OWNER, COMMITTEE OF SURVEYORS

Section 245—Legal Proceedings

(1). **Duty of City Attorney to Proceed.** Upon written request by the Building Inspector, subject to approval of Mayor, the City Attorney shall

sue for and collect all penalties and take charge of and conduct all legal proceedings imposed or provided for by this Code; and all suits or proceedings instituted for the enforcement of any of the several provisions of this Code or for the recovery of any penalty thereunder shall be brought in the name of the City of Miami by the City Attorney, to whom all notices of violation shall be returned for prosecution, and it shall be his duty to take charge of the prosecution of all such suits or proceedings, collect and receive all moneys that may be collected upon judgments, suits or proceedings so instituted, or which may be paid by any parties who have violated any of the provisions of this Code and upon settlement of judgment and removal of violations thereunder, execute satisfaction therefor.

(2). **Temporary Injunctions.** In any action or proceeding for the enforcement of the provisions of this Code the city of Miami may apply to the Court for an order enjoining and restraining any violation, ordering the property vacated or prohibiting its use for any purpose whatsoever, until the hearing and determination of such action and the entry of final judgment therein.

Section 246—Designation by an Owner of a Building

(1). Either a resident or a non-resident of the city of Miami, of full age, owning real estate or a building thereon, may execute and acknowledge in duplicate, a written designation of a resident of said city, as a person upon whom to serve a notice of violation, notice to make safe, or notice of survey, a summons, a mandate, or any paper or process, under the provision of this Code, or either of the same, and may file the same, with the written consent of the person so designated, duly acknowledged; one in the office of the Building Inspector, and one in the office of the City Clerk where the real estate or building or structure is situated. The designation must specify the residence and place of business of the person making it, and also of the person designated and the location of the property with respect to which the designation is made. It shall remain in force during the period specified therein, if any, or if no period is specified therein, until one year after the filing thereof, but it is revoked earlier, either by the death or legal incompetency of either of the parties, or by the filing of a revocation by either of the parties, duly acknowledged, and the consent of the Building Inspector. The City Clerk must immediately file and index such designation, consent or revocation; and shall note, upon the original designation and index, the filing of a revocation. While the designation remains in force as prescribed in this section, a notice of violation, notice to make safe or notice of survey, a summons, a mandate, or any paper or process under the provisions of this Code, or either of the same, may be served upon the person so designated, in like manner and with like effect, as if it were served personally upon the person making the designation, notwithstanding his presence in the city of Miami.

Section 247—Duty of Occupant to Notify Owner

(1). Should a notice of violation, a notice to make safe, or a notice of survey be served upon an occupant of real estate or a building or structure, it shall be the duty of the person upon whom such service is made, to give immediate notice thereof to the owner of said real estate or building or structure named in the notice, if such owner is within the city of Miami, and his residence is known to such person; and if he is not within the said city, by depositing such notice in a post office in the city of Miami properly enclosed in a postpaid wrapper addressed to such owner at his then known place of residence.

Section 248—Committee of Surveyors

(1). A committee of surveyors shall consist of three persons, one of whom shall be the Building Inspector or an Engineer, or an Inspector of

or Building Committeeman

the Bureau of Buildings designated in writing by said Building Inspector; another of whom shall be an architect, civil engineer or builder of at least ten years' practice in the city of Miami, appointed by the Mayor of said city; another of whom shall be a practicing architect, engineer or builder, of at least ten years' practice, appointed by the owner of said building or structure. In case the owner fails to appoint, or, having appointed, the said representative fails to attend according to notice, the two surveyors first named shall make the survey, and if they do not agree, they shall appoint another member, who shall be a practicing architect, engineer or builder of at least ten years' practice.

(2). The architect, civil engineer, or builder appointed by the Mayor of the city of Miami who may serve on a committee of surveyors, as prescribed in paragraph 1 of this section, shall receive the sum of — for each survey thereof, to be paid by the City Treasurer upon the voucher of the Building Inspector. Should the owner fail to appoint and it become necessary for the committee to appoint another member as prescribed in this section, the member so appointed shall receive the sum of for each survey, payable as above.

Section 249—Punishment for Violation of Provisions of Code

(1). Any person who shall construct, alter, remove or maintain a building or structure or any of its appurtenances in violation of any of the provisions of this code or in any other manner violate any of the provisions of this code, shall upon conviction be punished by a fine not exceeding \$200.00 or by imprisonment not exceeding ninety days, or by both fine and imprisonment not exceeding said amount or said term.

PART XXXIX

GENERAL PROVISIONS

Section 250—Existing Suits and Liabilities

(1). Nothing in this Code contained, shall be construed to affect any suit or proceeding now pending in any court, or any rights acquired, or liability incurred, nor any cause or causes of action accrued or existing, under any act or ordinance repealed hereby. Nor shall any right or remedy of any character be lost, impaired or affected by this Code.

Section 251—Invalidity of One Section Not to Invalidate Any Other

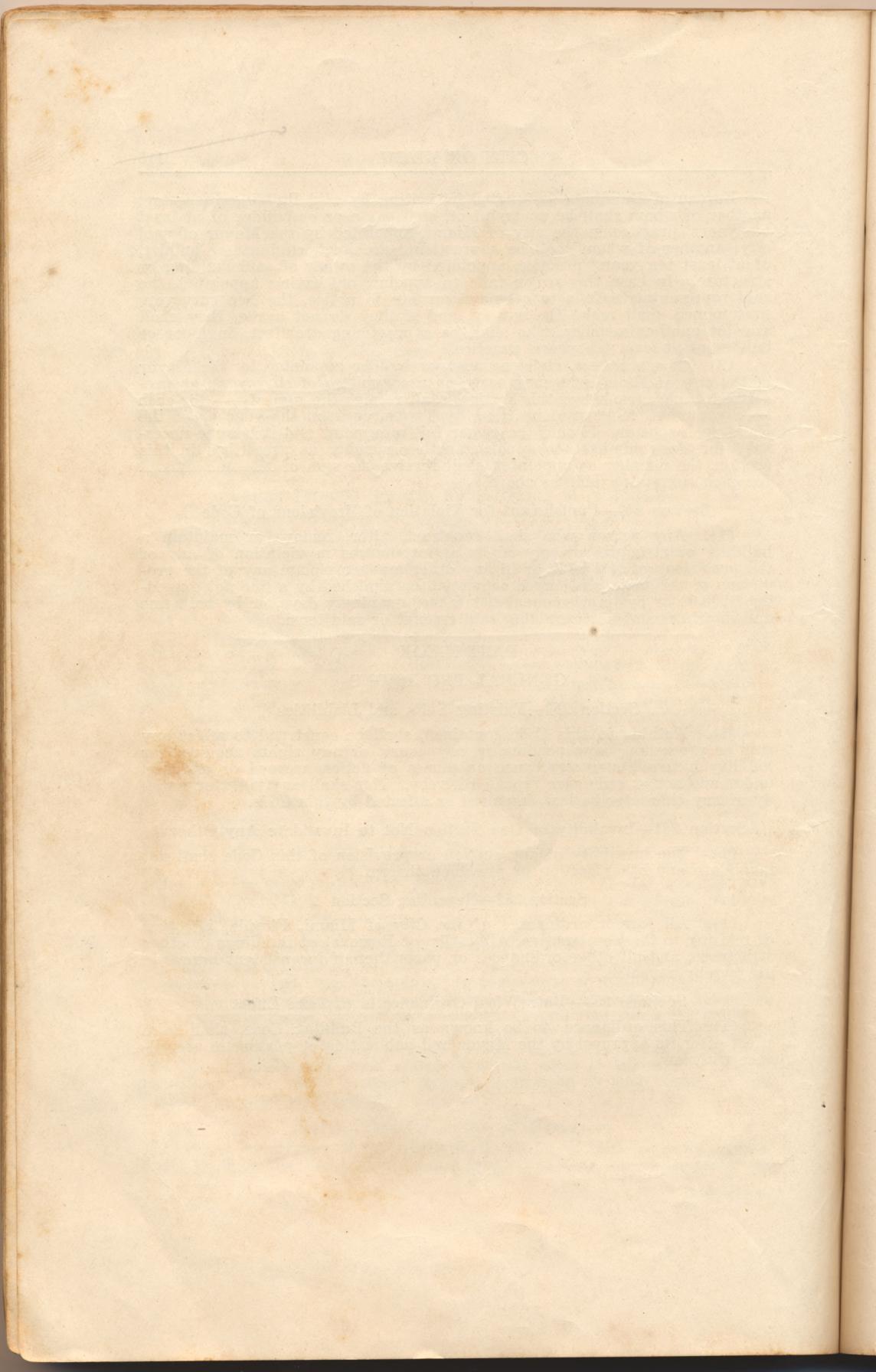
(1). The invalidity of any section or provision of this Code shall not invalidate any other section or provision thereof.

Section 252—Repealing Section

(1). All former ordinances of the City of Miami, Florida, affecting or relating to the Construction, Alteration or Removal of Buildings or other structures, and all other ordinances or parts thereof inconsistent herewith, are hereby repealed.

Sections 253—Date When Ordinance is to Take Effect

(1). This ordinance, to be known as the Building Code, shall take effect after its approval by the Mayor and publication or posting in accordance with law.



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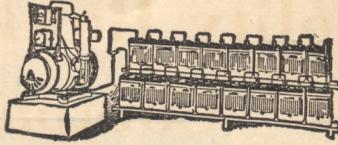
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