State Building Construction Code

APPLICABLE TO

One- and Two-Family Dwellings

(INCLUDING FACTORY MANUFACTURED HOMES)

Printed January 1, 1982

STATE OF NEW YORK
Hugh L. Carey, Governor
Richard A. Berman, Commissioner

NEW YORK STATE · DIVISION OF HOUSING & COMMUNITY RENEWAL ·

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New York, New York 10047

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FOREWORD

The State Building Construction Code and amendments thereto are promulgated by the State Building Code Council pursuant to Article 18 of the Executive Law. This Code, applicable to one- and two-family dwellings, is also promulgated by the State Building Code Council pursuant to the authority of Article 18-B of the Executive Law of the State of New York.

The regulations in the several portions of the Code are identified by a letter prefix before the number of each section:

One- and Two-Family Dwellings	—A
Multiple Dwellings	—B
General Building Construction	—C
Plumbing	—P

The portion applicable to One- and Two-Family Dwellings effective December 1, 1964 was amended and reprinted January 1, 1973. Since that time it has been further amended April 1, 1976, April 1, 1977, April 1, 1979, April 1, 1980 and April 1, 1981.

This printing, dated January 1, 1982 includes all the amendments which became effective since January 1, 1973.

The year mark which appears in the left margin above the section number, indicates the effective date of the amendment for the section.

The year mark which appears to the left of a sub-section, indicates the effective date for the sub-section.

The key for the effective dates of amendments to the Code since January 1, 1973 is as follows:

[1976]effective April 1, 1976
[1977]effective April 1, 1977
[1979]effective April 1, 1979
[1980]effective April 1, 1980
[1981]effective April 1, 1981

The official version of the Code for legal purposes is found in Volume 9 Executive (B) of the "Official Compilation of Codes, Rules and Regulations of the State of New York" published by the Secretary of State and designated 9 NYCRR for citation.

The numbers in parentheses refer to numbering used in Volume 9 of the "Official Compilation of Codes, Rules and Regulations of the State of New York."

The State Building Code Council is concerned with regulations for the construction of buildings and the installation therein of equipment that is essential to building operation and maintenance, such as plumbing, heating, electrical, ventilation and fire-protection equipment. The purpose of its regulations is to encourage the standardization of construction practices, equipment and material and eliminate restrictive, obsolete and conflicting building regulations which unnecessarily increase costs, retard use of new materials or provide unwarranted preferential treatment to materials, products or methods of

construction; and to establish reasonable safeguards for the safety, health and welfare of the occupants and users of buildings.

The facilities for code drafting and for technical research which have been established under the provisions of the law enable the Council to provide an up-to-date code for the benefit of the municipalities of the State. It acts as a central clearinghouse, investigating detailed data on materials, methods and equipment. It has established a procedure for acceptance of new materials and new construction methods, and makes its findings available to the municipalities. Such data are invaluable to municipalities, and especially to local building officials charged with building code administration and enforcement.

The administration and enforcement of the Code are the responsibility of the local municipality pursuant to its own administrative ordinance.

Zoning, which regulates the use of land and buildings, remains the prerogative of the municipalities.

The municipalities of the State have the option to accept or not to accept the applicability of the State Building Construction Code. Those municipalities which have already accepted the applicability of the Code obtain without further action the protection afforded by these amended regulations.

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Part 1

General Provisions

A 101 (600.1) **TITLE**

These regulations, promulgated pursuant to Article 18 of the Executive Law of the State of New York, shall be known as the State Building Construction Code applicable to one- and two-family dwellings. They are hereinafter referred to as this Code.

A 102 (600.2) **PURPOSE**

The purpose of this Code is to provide basic and uniform regulations in terms of performance objectives, establishing reasonable safeguards for the safety, health, and welfare of the occupants and users of one- and two-family dwellings, and their accessory structures, and making adequate performance the test of acceptability.

A 103 (600.3) **EFFECTIVE DATE**

This Code was first promulgated on November 1, 1951. Sections of this Code were amended as of February 15, 1954, May 1, 1958 and December 1, 1964. There was a general revision of this Code, resulting in numerous changes, effective January 1, 1973. Since then, sections of this Code have been amended effective April 1, 1976, April 1, 1977, April 1, 1979, April 1, 1980 and April 1, 1981.

A 104 (600.4) **PARTIAL INVALIDITY**

If any term, part, provision, section, subdivision or paragraph of this Code shall be held unconstitutional, invalid or ineffective in whole or in part, such determination shall not be deemed to invalidate the remaining terms, parts, provisions, sections, subdivisions and paragraphs thereof.

A 105 (601) **SCOPE**

A 105-1 (600.1) **New Buildings**

a—This Code shall apply to one- and two-family dwellings, including their accessory structures and parts thereof, and to buildings containing mixed occupancies in which the residential occupancy is a one- or two-family dwelling as defined in this Code.
b—Multiple dwellings containing not more than two dwelling units within walls conforming to the requirements of sections

B 401-8.1 and B 401-8.2 applicable to multiple dwellings shall be regulated as one- or two-family dwellings pursuant to this Code.

A 105-2 (601.2) Existing Buildings

A 105-2.1 (601.2a) General

This Code shall also apply to existing buildings described in this section as if hereafter erected.

a—A building hereafter occupied as a one- or two-family dwelling which building was not so occupied when this Code became applicable to the municipality in which the building is situated, and to buildings containing mixed occupancies in which the residential portion does not exceed two dwelling units and was not previously so occupied.

b—A building which is moved into, or moved within, municipal limits subject to this Code.

c—A building occupied as a one- or two-family dwelling which is altered or repaired, when the cost of such alterations or repairs within any six-month period exceeds 50 per cent of the cost of replacement of the building at the beginning of that six-month period.

d—A building whose occupancy is changed from a one-family dwelling to a two-family dwelling, and a building of mixed occupancy in which the residential portion is changed from a one-family dwelling to a two-family dwelling.

A 105-2.2 (601.2b) Roof Covering

Whenever more than 25 per cent of the roof covering of a building is replaced in any six-month period, all roof covering on such building shall be made to comply with applicable regulations of the Code.

A 105-2.3 (601.2c) Addition or Alteration

Any addition or alteration made to a building shall be made in conformity with applicable regulations of this Code.

A 105-2.4 (601.2d) Existing Uses Continued

Except as otherwise herein provided, nothing in this Code shall require removal, alteration, or abandonment of, nor prevent continued occupancy or use of, an existing building.

A 105-3 (601.3) Lodgers

This Code is not applicable to a building occupied by one or two families when more than four lodgers reside with any one family.

When so occupied, said building becomes subject to the regulations of that portion of the Code applicable to multiple dwellings.

A 105-4 (601.4) **Mixed Occupancy**

A building which is occupied in part for residential use, and in part for some other use not accessory thereto, shall be deemed to be a building of mixed occupancy, and, except for the separation requirements as set forth in section A 402-3, occupancy other than residential is not regulated by this Code.

A 105-5 (601.5) **Maintenance**

Buildings subject to this Code shall be maintained in a safe and sanitary condition in conformity with the provisions of this Code.

A 105-6 (601.6) **Zoning**

No provision of this Code shall be construed to repeal, modify, or constitute an alternative to any lawful zoning regulation.

A 105-7 (601.7) **Fallout Shelters**

This Code shall not apply to fallout shelters intended for emergency use where such fallout shelters are constructed or installed or proposed to be constructed or installed to provide safety and security to the occupants in accordance with approved specifications, standards, or regulations.

A 105-8 (601.8) **Workmanship**

Workmanship shall conform to generally accepted good practice in the applicable trade.

A 106 (602.1) **QUALITY OF MATERIALS**

All materials, assemblies, construction, and equipment shall conform to the regulations of this Code, and shall conform to generally accepted standards with respect to strength, durability, corrosion resistance, fire resistance, and other qualities recognized under those standards. All test specimens and construction shall be truly representative of the material, workmanship, and details to be used in actual practice.

A 107 (602.2) **ACCEPTABILITY**

a—Compliance with applicable provisions of generally accepted standards, except as otherwise prescribed in this Code, shall constitute compliance with this Code.

b—Deviations from applicable provisions of generally accepted standards, when it shall have been conclusively proved that such deviations meet the performance requirements of this Code, shall constitute compliance with the Code.

A 108 (603) ABBREVIATIONS AND DEFINITIONS

A 108-1 (603.1) General

a—Abbreviations, terms, phrases, words, and their derivatives used in this Code shall have the meanings given in this section. b—Words used in the singular include the plural, and the plural the singular. Words used in the masculine gender include the feminine and neuter genders.

A 108-2 (603.2) Abbreviations

Btu British thermal unit
C. Centigrade
c Combustible
cfm Cubic feet per minute
F. Fahrenheit
ft Foot or feet
gal Gallon or gallons
gpm Gallons per minute
in. Inch or inches
max Maximum
min Minimum
nc Noncombustible
np Not permitted
p Permitted
psf Pounds per square foot
psi Pounds per square inch
un Unlimited

A 108-3 (603.3) Definitions

accessory structure. A structure, the use of which is incidental to that of the main building, and which is attached thereto or is located on the same premises.
accessory use. A use, occupancy or tenancy customarily incidental to the principal use or occupancy of a building.
addition. Extension or increase in area, height or equipment of a building.
alley. Narrow supplementary thoroughfare for the public use of vehicles or pedestrians, affording access to abutting property.
alteration. Any change, rearrangement, or addition to a building, other than repairs; any modification in construction or in building equipment.
approved. Approved by the enforcement officer under the regulations of this Code, or approved by an authority designated by law or this Code, or acceptable in accordance with the condition set forth in section A 107.
attic. Space between top of uppermost floor construction and underside of roof.

basement. That space of a building that is partly below grade which has more than half of its height, measured from floor to ceiling, above the average established curb level or finished grade of the ground adjoining the building.

bathroom. Enclosed space containing one or more bathtubs or showers, or both, and which may also contain water closets, lavatories, or fixtures serving similar purposes. See definition of **toilet room.**

building. A structure wholly or partially enclosed within exterior walls, or within exterior and party walls, and a roof, affording shelter to persons, animals, or property.

building line. Line established by law, ordinance, or regulation, beyond which no part of a building, other than parts expressly permitted, shall extend.

cellar. That space of a building that is partly or entirely below grade, which has more than half of its height, measured from floor to ceiling, below the average established curb level or finished grade of the ground adjoining the building.

combustible. Material or combination of materials which is not noncombustible. See definition of **noncombustible.**

1981 **community residence.** A facility for mentally disabled as defined by the Mental Hygiene Law and the rules and regulations issued under this law.

construction classification. A classification of buildings into types of construction which is based on the fire resistance of the walls, floors, roof and other structural members. (See table A 204.)

——**type 1, fire-resistive construction.** That type of construction in which the walls, partitions, columns, floors and roof are noncombustible with sufficient fire resistance to withstand the effects of a fire and prevent its spread from story to story.

——**type 2, noncombustible construction.** That type of construction in which the walls, partitions, columns, floors and roof are noncombustible and have less fire resistance than required for fire-resistive construction, and in which exterior bearing walls of type 2a construction have a fire-resistance rating of not less than 2 hours.

——**type 3, heavy timber construction.** That type of construction in which the exterior walls are of masonry or other noncombustible materials having equivalent structural stability under fire conditions and a fire-resistance rating of not less than 2 hours; the interior structural members including columns, beams and girders, are of heavy timber, in heavy solid or laminated masses, but with no sharp corners or projections or concealed or inaccessible spaces; the floors and roofs are of heavy plank or laminated wood construction, or of any other material providing

equivalent fire-resistance and structural properties; or construction is as set forth in the generally accepted standards.

——**type 4, ordinary construction.** That type of construction in which the exterior walls are of masonry or other noncombustible materials having equivalent structural stability under fire conditions and a fire-resistance rating of not less than 2 hours, the interior structural members being wholly or partly of wood of smaller dimensions than those required for heavy timber construction.

——**type 5, frame construction.** That type of construction in which the walls, partitions, floors and roof are wholly or partly of wood or other combustible material, and in which the exterior walls of type 5a construction have a fire-resistance rating of not less than ¾ hour.

construction, fireproof. Type 1 fire-resistive construction.

curb level. The elevation of the curb opposite the center of the front of the building. If a building faces on more than one street, the curb level shall be the average of the elevations of the curbs at the center of each side or front of the building. Where no curb level or equivalent has been established by the municipal authority, the average elevation of the finished grade immediately adjacent to the front of the building shall be considered as the curb level. If a building faces on more than one street where no curb level has been established, the average of the elevations of the finished grade on each street side of the building shall be considered as the curb level.

distance separation. An open space between buildings or between a building and an interior lot line, provided to prevent the spread of fire.

[1981] **dwelling.** Building containing not more than two dwelling units occupied for residential uses or as community residence.

——**one-family dwelling.** Building arranged for one dwelling unit.

——**two-family dwelling.** Building arranged for two dwelling units.

dwelling unit. One or more rooms with provision for living, cooking, sanitary, and sleeping facilities arranged for the use of one family.

enforcement officer. A person lawfully empowered to enforce the regulations of this Code.

exit. That portion of the way of departure from the interior of a building or structure to the exterior at street, or grade level accessible to a street, consisting of:

a——Corridors and stairways enclosed in construction having a fire-resistance rating; or

b——a door to the exterior at grade; or

c——an exterior stairway, or ramp.

fallout shelter. A building, structure or other real property, or an

area or portion thereof, constructed, altered or improved to afford protection against harmful radiation resulting from radioactive fallout, including such plumbing, heating, electrical, ventilating, conditioning, filtrating and refrigeration equipment and other mechanical additions or installations, if any, as may be an integral part thereof.

family. A household constituting a single housekeeping unit occupied by one or more persons.

fire area. The floor area of a story of a building within exterior walls, party walls, fire walls, or any combination thereof.

fire limits. Boundary line establishing an area in which there exists, or is likely to exist, a fire hazard requiring special fire protection.

fireproof. Fire resistive.

fire resistance. That property of materials, construction or assembly of materials, which under fire conditions prevents or retards the passage of excessive heat, hot gases, or flames.

fire-resistance rating. Time in hours or parts thereof that a material, construction, or assembly will withstand fire exposure, as determined in a fire test made in conformity with generally accepted standards, or as determined by extension or interpretation of information derived therefrom.

fire resistive. The quality of materials, assemblies, constructions, or structures to resist fire and prevent its spread; fireproof.

fire separation. A construction of specific fire resistance separating parts of a building.

firestopping. A barrier effective against the spread of flames or hot gases within or between concealed spaces.

flame-resistant material. Material which is flame resistant by nature or has been made flame resistant in conformity with generally accepted standards.

flame-spread. The propagation of flame over a surface.

flame-spread rating. The measurement of flame spread on the surface of materials or their assemblies as determined by tests conducted in conformity with a generally accepted standard.

flammable. Capable of igniting within 5 seconds when exposed to flame and continuing to burn.

floor area. The floor area within surrounding walls of a building, or portion thereof.

flue. Enclosed passage, primarily vertical, suitable for removal to the outer air of gaseous products of combustion.

gasvent. Enclosed passage used for removal to the outer air of products of combustion from gas-fired equipment only.

generally accepted standard. A specification, code, rule, guide or procedure in the field of construction or related thereto, recognized and accepted as authoritative.

grade, finished. Natural surface of the ground, or surface of ground after completion of any change in contour.

will not ignite, support combustion, or liberate flammable gas when tested in accordance with generally accepted standards.

occupancy. Use of a building, structure, or premises.

occupied. Used, or intended, arranged or designed to be used.

opening protective. Assembly of materials and accessories, including frames and hardware, installed in a wall, partition, floor, ceiling or roof opening to prevent, resist or retard the passage of fire, flame, excessive heat or hot gases.

——**automatic.** Constructed and arranged to operate other than manually; if open, it will close when subjected to a predetermined temperature or rate of temperature rise.

——**self-closing.** Arranged and equipped with devices which will insure closing after having been opened.

premises. A lot, plot, or parcel of land including the buildings or structures thereon.

property line. Line establishing the boundaries of premises.

1980 **repair.** Replacement or renewal, excluding additions, of any part of a building, structure, device, or equipment, with like or similar materials or parts, for the purpose of maintenance, preservation or restoration of such building, structure, device, or equipment.

required. Required by this Code.

residual deflection. Deflection resulting from an applied load, remaining after removal of such load.

roof covering. Material applied to roof surface for protection against the elements. Roof insulation shall not be deemed to be a roof covering.

self-closing. See definition under **opening protective.**

shall. As used in this Code, is mandatory.

1976 **smoke-detecting alarm device, single-station.** An assembly comprised of a photoelectric or ionization type of smoke detector, control equipment and audible alarm in one unit, which upon detection of smoke, activates the alarm.

smoke pipe. Enclosed passage, used to convey the products of combustion of any fuel to a flue.

stairway. One or more flights of stairs and the necessary landings and platforms connected therewith to form a continuous passage from one floor to another.

story. Portion of a building which is between one floor level and the next higher floor level or the roof. If a mezzanine floor area exceeds one third of the area of the floor immediately below, it shall be deemed to be a story. A basement shall be deemed to be a story when the finished floor immediately above is 7 feet or more above the average elevation of the finished grade. A cellar shall not be deemed to be a story. An attic shall be deemed to be a story where it meets the requirements for habitable space.

street. Thoroughfare dedicated and accepted by a municipality for public use or legally existing on any map of a subdivision filed in the manner provided by law.

street line. Line dividing a lot, plot, or parcel from a street.

structural damage. Loosening, twisting, warping, cracking, distortion, or breaking of any piece, or of any fastening or joint, in a structural assembly, with loss of sustaining capacity of the assembly. The following shall not be deemed to constitute structural damage: small cracks in reinforced concrete, perpendicular to the reinforcing bars; deformation of sheet material when a structural assembly is under applied load, which increases as such load increases but which disappears when such load is removed.

structural failure. Rupture; loss of sustaining capacity or stability; marked increase in strain without increase in load; deformation increasing more rapidly than the increase in imposed load.

structure. An assembly of materials, forming a construction framed of component structural parts for occupancy or use, including buildings.

1979 **thermal barrier.** A noncombustible protective shield which when applied on the interior of a building to cover foam plastic insulation shall remain in place and provide fire protection for at least 15 minutes.

toilet room. Enclosed space, containing one or more water closets, which may also contain one or more lavatories, urinals, and other plumbing fixtures. See definition of **bathroom.**

ventilation. Supply and removal of air to and from any space by natural or mechanical means.

ventilation, mechanical. Ventilation by power-driven devices.

ventilation, natural. Ventilation by opening to outer air through windows, skylights, doors, louvers, or stacks with or without wind-driven devices.

wall, fire. A wall of noncombustible construction, with qualities of fire resistance and structural stability, which completely subdivides a building into fire areas, and which resists the spread of fire.

wall, party. A wall on an interior lot line used or adapted for joint service between two buildings or structures.

yield strength. Stress at which a material exhibits a specified limiting permanent set.

A 109 (604.1)

SAFETY DURING CONSTRUCTION

a—Construction, within the scope of this Code, shall be performed in such manner that the workmen and public shall be protected from injury, and adjoining property shall be protected from damage, by the use of scaffolding, underpinning, or other approved methods.

b—Access to all utilities and public facilities, including among others, fire alarm boxes, police call boxes, street lights, and manholes, shall be kept unobstructed during construction.

c—Fuel-burning equipment furnishing temporary heat during

Part 2

Space Requirements

A 201 (610)

GENERAL REQUIREMENTS

1981 a—Buildings occupied or used as a one- and two-family dwelling or a community residence in whole or in part for purposes within the scope of this Code, shall be designed and constructed so as to comply with the requirements hereinafter set forth in order to provide safe and healthful environment.

b—The term, accessory use, shall have a uniform meaning and shall apply in the same manner and under the same conditions or restrictions to all buildings.

A 202 (611)

HABITABLE SPACE

A 202-1 (611.1)

Light

1981 a—Habitable space except kitchens, shall be provided with natural light through one or more windows, skylights, transparent or translucent panels, or any combination thereof, that face directly on legal open spaces at least 5 feet wide above the adjoining finished grade, or above a roof. The amount of light shall be equivalent to that transmitted through clear glass equal in area to 8 per cent of the floor area of the habitable space.

b—Kitchens shall be provided with artificial lighting equipment and may also be provided with natural light.

1981

A 202-2 (611.2)

Ventilation

Habitable space shall be provided with ventilation in accordance with either of the following:

Natural ventilation through openable parts of windows or other openings in exterior walls that face legal open spaces at least 5 feet wide above the adjoining finished grade or above a roof, or through openable parts of skylights, providing total clear ventilation area equal to not less than 4 per cent of the total floor area of each habitable space; or

Mechanical ventilation providing outdoor air, or a mixture of outdoor and recirculated air in accordance with the quantities set forth in the applicable requirements of the State Energy Conservation Construction Code.

A 202-3 (611.3) **Location in Respect to Grade Level**

Floor level of habitable space shall be not more than 4 feet below the average adjoining finished grade. No habitable space shall be located in cellars, except that below-grade space is permitted as habitable space where in conformity with the following conditions:

1) the grade adjoining one exterior wall for the entire width of the habitable space is at or lower than the floor level of the habitable space;
2) the depth is not more than four times the height; and
3) such space conforms to all other requirements for habitable space.

A 202-4 (611.4) **Size**

a—A dwelling unit shall contain at least one habitable space which shall have a minimum floor area of 150 square feet with a minimum horizontal dimensions of 10 feet. Other habitable spaces, except kitchens, shall have a minimum floor area of 80 square feet with a minimum horizontal dimension of 7 feet.

b—Habitable space shall have a minimum height of 7 feet 6 inches, except that for habitable space under a sloping roof the minimum height in at least 50 per cent of the floor area shall be 7 feet 6 inches and the area where the height is less than 5 feet shall not be considered in computing required floor area.

c—Where exposed beams project below the ceiling of habitable space, and such beams occupy an area of 5 per cent or more of the area of the ceiling, the height of the space shall be measured from finished floor to the underside of the beams; where the ratio is less than 5 per cent, the height shall be measured to the ceiling, and the height to the underside of beams shall be not less than 7 feet.

A 203 (612) **NONHABITABLE SPACE**

A 203-1 (612.1) **General Requirements**

a—Nonhabitable space shall be provided with light and ventilation adequate for the intended use of each space. Bathrooms and toilet rooms shall have provisions for privacy.

b—Bathrooms, toilet rooms, kitchenettes, corridors and recreation rooms shall have a minimum height of 7 feet.

A 203-2 (612.2) **Light**

Kitchenettes, bathrooms, and toilet rooms shall be provided with light of sufficient intensity and so distributed as to permit the maintenance of sanitary conditions and the safe use of the space and the appliances, equipment, and fixtures.

construction, except portable equipment, shall be provided with a smokepipe, chimney or flue to convey the products of combustion to the exterior without creating a health hazard; confined spaces having portable fuel-burning equipment shall be adequately ventilated so as to prevent dangerous accumulation of products of combustion.

A 110
(604.2)

SAFETY DURING DEMOLITION

a—Safe and sanitary conditions shall be provided where demolition and wrecking operations are being carried on. Work shall be done in such manner that hazard from fire, possibility of injury, danger to health, and conditions which may constitute a public nuisance will be minimized, in conformity with generally accepted standards.

b—Access to utilities and public facilities, including among others, fire hydrants, fire alarm boxes, police call boxes, street lights, and manholes, shall be kept unobstructed during demolition.

c—Gas, electric, sewer, heat, power, water and other service connections shall be disconnected, removed, or sealed, in conformity with the applicable regulations of the public utility or municipal agency having jurisdiction.

1980

A 111
(605)

ENERGY CONSERVATION

Buildings shall be designed and constructed so that the thermal resistance and air leakage at the building envelope and the design and selection of equipment and systems for the purpose of energy conservation shall comply with the applicable provisions set forth in the State Energy Conservation Construction Code.

1980
A 203-3 (612.3)

Ventilation

Kitchenettes, bathrooms, and toilet rooms shall be provided with ventilation in accordance with either of the following:

Natural ventilation as set forth in section A 202-2, except that such openable areas shall be not less than 1½ square feet for bathrooms or toilet rooms and not less than 3 square feet for kitchenettes, or

Mechanical exhaust ventilation in accordance with the quantities set forth in the applicable requirements of the State Energy Conservation Construction Code.

A 204 (613)

HEIGHT, FIRE AREA AND TYPE OF CONSTRUCTION

a—Buildings of type 5 construction shall not exceed a height of two stories above a basement or cellar, or above finished grade where there is no basement or cellar.

b—The maximum fire area in a dwelling, within exterior walls, party walls, fire walls, or any other combination thereof, shall be determined by the construction classification of the building, and as set forth in Table A 204.

1981 **TABLE A 204. (I-613)—MAXIMUM PERMITTED FIRE AREAS**

Construction classification[1]	Floor	Other structural elements except exterior and fire walls[1]	Maximum area in square feet
Type 1	2 hr	¾ hr or more	Unlimited
Type 2a	¾ hr	¾ hr	10,000
Type 2b	nc	nc	8,000
Type 3	¾ hr	¾ hr[2]	8,000
Type 4a	¾ hr	¾ hr[2]	8,000
Type 4b	c	c	7,000
Type 5a	¾ hr	¾ hr[2]	7,000
Type 5b	c	x	6,000

[1]For fire-resistance rating of exterior walls, see definition of construction classification, section A 108-3, and of fire walls, see section A 402-2.2.
[2]No fire-resistance rating is required for roof construction.

c—Where a building is constructed of two or more types of construction, the construction classification of the entire building shall be the lowest of such types of construction.

d—The height in stories of a building shall be determined from a datum established by the average elevation of the finished grade adjoining the exterior walls of the building, where such walls face adjacent legal open space or abut other open space which is approximately level for a distance of at least 10 feet.

A 205 (614) STAIRS

A 205-1 (614.1) General Requirements

Stairs, both interior and exterior, shall be arranged and constructed to provide safe ascent and descent. A fixed stair shall be provided where travel is required between two stories, each of which contains a habitable space or a recreation room, and between the first story and basement or cellar. Disappearing or folding stairs may be used between an above-grade story and an attic without a habitable space or recreation room.

A 205-2 (614.2) Treads

a—Minimum widths of treads shall be 9 inches, plus 1 1/8-inch nosing for closed riser type, or 9 inches for open riser type, except that treads of folding or disappearing stairs intended for occasional use only shall have a minimum width of 6 inches.

b—Winder treads at converging ends of winders, exclusive of minimum 1-inch nosings, shall be not less than 4 inches wide unless the winders are guarded at the converging ends by continuous handrails which prevent walking where the tread widths are less than 6 inches. If the winder treads are without a minimum 1-inch nosing, the tread widths in these locations shall be not less than 5 inches and 7 inches, respectively.

c—Winder tread widths at a distance of 18 inches from the converging ends shall be not less than the tread widths as set forth in paragraph a of this section.

d—Treads shall be level and all other than winder treads shall be uniform in width, with no variation exceeding 1/8 inch in any one run of stairs.

A 205-3 (614.3) Risers

a—Maximum heights of risers shall be 8¼ inches except that the maximum height of risers of folding or disappearing stairs, exterior stairs to basements or cellars, and of other stairs intended for occasional use only, shall be 9 inches.

b—There shall be no variation exceeding 1/8 inch in the height of risers in any one run of stairs.

A 205-4 (614.4) Width

Widths of stairs connecting habitable spaces shall be not less than 2 feet 8 inches clear between handrails or between handrail and opposite wall surface; except that stairs from a second story to a third story, and stairs to a basement and to a cellar shall not be less than 2 feet 6 inches clear between handrails or between handrail and opposite wall surface.

A 205-5 (614.5) **Headroom**

The minimum clear headroom over any portion of any fixed stair tread shall be not less than 6 feet 6 inches measured vertically from the surface of the tread, except that the minimum shall be not less than 6 feet 4 inches over stairs from a second story to a third story and over stairs to a basement or to a cellar.

A 205-6 (614.6) **Handrails and Railings**

a—Stairs or steps of more than three risers shall have a handrail or railing parallel to the stair slope on at least one side. Where one or both sides of such stairs or steps are open, railings shall be provided on open sides.

b—Window openings on stairs or landings, and well openings, shall be guarded by railings or other equivalent protection.

c—Landings, platforms and porches more than 18 inches above the adjacent floor or grade level shall be provided with railings on the open sides, except where openings are required for access.

d—Top surfaces of handrails and railings shall be not less than 30 inches nor more than 36 inches in height above the floor or tread level. On stair runs, the height shall be measured directly above the riser face.

e—Clearance between handrail and supporting wall shall be not less than 1½ inches.

A 205-7 (614.7) **Landings**

The swing of a door opening on a stairway shall not overlap the top step. Where landings are provided, their width shall be not less than the width of the stair of which they are a part.

A 205-8 (614.8) **Light**

Treads of stairs shall be lighted by either natural or artificial light of sufficient intensity to allow safe ascent and descent.

A 206 (615) **EXITS**

A 206-1 (615.1) **General Requirements**

a—Exit stairways may serve in common two dwelling units as set forth in section A 402-3.4.

b—In addition to the primary exit from a recreation room, or a habitable space except kitchens, there shall be provided in each such space at least one opening for emergency use.

A 206-2 (615.2) **Openings for Emergency Use**

a—Openings for emergency use shall include doors or openable parts of windows, located so as to provide unobstructed egress to legal open spaces.

b—Such openings shall not impede egress in an emergency, shall have a minimum area of 4 square feet, with a minimum dimension of 18 inches, with bottom of openings no higher than 3 feet 6 inches above finished floor in all above-grade stories, and no higher than 4 feet 6 inches where required in basement and cellar.

A 206-3 (615.3) Exits for One-Family Dwellings More than Three Stories in Height

One-family dwellings exceeding three stories in height shall have exits from every story which provide safe, continuous passage to a legal open space and shall have at least one interior stairway enclosed in construction having a fire-resistance rating of at least ¾ hour. All openings in such enclosures shall be provided with a self-closing opening protective as set forth in section A 402-3.7.

A 206-3.1 (615.3b) Width of Interior Exit Stairs

Interior exit stairs in dwellings more than two stories in height shall be at least 3 feet wide, and in all other respects shall comply with section A 205.

A 206-4 (615.4) Exits for Dwelling Units in Buildings with Mixed Occupancy and for Two-Family Dwellings

Exits for dwelling units in buildings containing mixed occupancy and for two-family dwellings shall conform with the provisions set forth in section A 402-3.4.

A 207 (616) GLAZING IN DOORS, SHOWER STALLS, FIXED PANELS AND BATHTUB ENCLOSURES

a—Glazing in doors, shower doors and enclosures, and bathtub doors and enclosures shall be so sized, constructed, treated or combined with other materials as to minimize effectively the possibility of injury to persons in the event the glazing is cracked or broken.

b—Glazing in doors, fixed side panels adjoining doors, and in interior partitions where glazing extends to within 18 inches or less of floor level, shall conform to the requirements of paragraph a of this section; or in lieu thereof in fixed panels, permanent construction shall be provided to guard against accidental human impact.

c—Shatter-resistant material may be substituted for glass intended to be used as described in this section. Where used in exits such material shall conform to the requirements of section A 403.

d—Where generally accepted standards require glazing to be identified, each piece shall be permanently and legibly marked in conformity with the requirements of the generally accepted standards.

1980
A 208
(617)

HISTORIC BUILDINGS

Buildings which are officially designated as historic buildings because of historical or architectural importance shall be permitted to be repaired for the purpose of historical preservation or restoration without conforming to the requirements of the Code provided that the existing use is continued and the repairs are acceptable to and deemed safe by the local authority having jurisdiction except that requirements for facilities for the physically handicapped shall remain applicable.

Part 3

Structural Requirements

A 301
(630)

GENERAL REQUIREMENTS

a—Buildings and parts thereof shall be capable of sustaining safely their own weight and the loads to which they may be subject, as set forth in this part of this Code.

b—Buildings shall be constructed and integrated so that loads are transmitted to the soil without undue differential settlement, unsafe deformation or movement of the building or of any structural part.

c—Wherever structural material or assemblies are subject to deterioration and might become structurally unsound if unprotected, protection in conformity with generally accepted standards for the material involved shall be provided. Causes of such deterioration include, among others, action of freezing and thawing, dampness, corrosion, wetting and drying, and termites and other destructive insects.

d—Crawl spaces and unheated concealed spaces below roofs shall be ventilated by openings so located and of such area as to minimize deterioration of the structural members from condensation or other causes, in conformity with generally accepted standards.

e—Buildings shall be constructed so that ground and surface water will not penetrate into habitable spaces, basements and cellars. Surface adjoining buildings shall be arranged to divert surface water away from the building.

f—Materials, assemblies, connections, fastenings and structural members to which they are attached shall be structurally stable, with allowances made for differences in the expansion and contraction coefficients of connected materials in conformity with generally accepted standards for the material involved.

A 302
(631)

SOIL BEARING VALUE

A 302-1
(631.1)

General Requirements

The bearing value of the soil shall be determined in order that foundations may be proportioned so as to provide a minimum of absolute and differential settlement. Soil or pile tests, presumptive bearing values of the soil, reduction factors for pile groups, and pile-driving formulas, referred to in this Code, shall be in conformity with generally accepted standards.

A 302-2 (631.2) **Determination**

a—For buildings 40 feet or less in height, the allowable bearing value of the soil upon which the building rests shall be the presumptive bearing value or shall be determined by field loading tests made in conformity with generally accepted standards.

b—For buildings more than 40 feet in height, where the footing load on the soil exceeds 1000 psf, there shall be a minimum of one test pit or boring for every 2500 square feet or part thereof of grade-floor building area, carried sufficiently into acceptable bearing material to establish its character and thickness. At least one boring shall be carried to a minimum depth below grade equal to the height of building, or to that minimum depth which shows 25 continuous feet of fine sand or better bearing material than fine sand, or 5 feet of bed rock, below the deepest proposed footing. A record of all borings made by core drill or spoon showing the foot-by-foot character of the soil, the ground water level, and the number of blows required for each foot of penetration of the spoon, shall be kept and certified by the architect or engineer in charge. The subsurface exploration apparatus including the size of spoon, weight and the drop shall be in conformity with generally acceptable standards. Wash borings shall be deemed unacceptable. Boring samples taken at each significant change of soil strata and at 5-foot intervals thereafter shall be retained and made available to the enforcement officer. When in his opinion additional subsurface information is required because of the variable geology of the site, additional test pits or borings shall be made.

c—For buildings more than 40 feet in height, when the building load is transferred to the soil by spread footings, the allowable bearing values of the successive layers of soil determined by test pits or borings shall be the presumptive bearing values and, if required by the enforcement officer, shall be substantiated by field loading soil tests made on undisturbed, natural soil at the level of the proposed foundation with fill, if any, removed.

d—For buildings more than 40 feet in height, when the building load is transferred to the soil through the medium of friction or bearing piles, the capacity of a pile group shall be the number of piles multiplied by the capacity of one pile and by a reduction factor for friction piles. The capacity of a pile shall be determined by either of the following methods or by an approved combination of them with a limit determined by the strength of the pile as a structural member: a field loading pile test, with a minimum of two test piles, or a generally accepted pile-driving formula.

A 302-3 (631.3) **Performance Criteria for Field Loading Soil Test**

Under field loading soil test, the total settlement caused by the

proposed load on the soil, measured after a period during which no settlement has occurred for 24 hours, shall not exceed ¾ inch. The additional settlement caused by a 50 per cent increase in the proposed load, measured after a period during which no settlement has occurred for 24 hours, shall not exceed 60 per cent of the total settlement as previously measured under the proposed load.

A 302-4 (631.4) **Performance Criteria for Pile Test**

a—The test load shall be twice the proposed pile load, applied in increments of one quarter of the proposed pile load, with readings of settlements taken to the nearest 1/32 inch and plotted against load. The test load may be increased to more than twice the proposed pile load value until the gross settlement is approximately 1 inch. At each step the load shall remain unchanged until there is no settlement in a 2-hour period, and the test load shall remain in place until there is no settlement in 48 hours.

b—The total test load shall then be removed in decrements not exceeding one quarter of the total test load at intervals of not less than 1 hour, with rebound read after each removal of load and plotted against load and with the final rebound recorded 24 hours after removal of the last decrement. The allowable pile load shall be the lesser of one half of that load which caused:

A gross settlement of 1 inch, or

A net settlement (gross settlement minus total rebound) equal to 0.01 inch per ton times total test load in tons, with a limit determined by the strength of the pile as a structural member.

A 303 (632) ALLOWABLE STRESSES OF MATERIALS

A 303-1 (632.1) **General Requirements**

Safe working stresses shall be assigned to materials in accordance with their classification either as controlled materials or ordinary materials, and these stresses shall not be exceeded unless specifically permitted in section A 304-10.

A 303-2 (632.2) **Controlled Materials**

Where controlled materials are identified and certified for quality and strength by a recognized authoritative inspection service, grading organization, or testing laboratory acceptable to make such tests, such materials shall also conform to the specifications and stresses for controlled materials, in generally accepted standards. When a material is formed and cast in the field, tests prior to the construction and during the construction shall be made, and the composition and strength of the material shall be certified by any of the above appropriate agencies or by the architect or engineer responsible for the design.

A 303-3 (632.3) Ordinary Materials

Materials which do not conform to the requirements for controlled materials shall be considered ordinary materials, and their quality and safe working stresses shall conform to the specifications and stresses for ordinary materials in generally accepted standards. When quality and safe working stresses are not so specified, they shall be determined by test in conformity with section A 305. When a material is formed and cast in the field, tests during the construction shall be made and its composition and strength certified by any of the appropriate agencies designated under section A 303-2, or by the architect or engineer responsible for the design.

A 304 (633) DESIGN LOADS

A 304-1 (633.1) General Requirements

A building and all parts thereof shall be of sufficient strength to support the design loads and to resist the deformations caused by such loads to which they may be subjected, without exceeding the allowable stresses as described in section A 305. Such loads shall include the dead load and the following imposed loads where applicable: live, snow, wind, soil pressure including surcharge, hydrostatic head, and impact loads.

A 304-2 (633.2) Live Loads

A 304-2.1 (633.2a) General

a—Loads set forth in table A 304-2.2 do not include unusual concentrations, such as, but not limited to, storage units, floor-to-ceiling bookracks, and elevator machine loads. Where such loads occur, suitable provisions shall be made for their support.
b—Where such unusual concentrations do not occur, structural members, and flooring spanning between the supporting structural members, shall be designed to support the uniformly distributed loads or the concentrated loads set forth in table A 304-2.2, whichever produce the greater stress.

[1979] c—Uniformly distributed live loads on beams or girders, when such structural member supports 150 square feet or more of roof area or floor area per floor, may be reduced as follows:

When the dead load is not more than 25 psf, the reduction shall be not more than 20 per cent,

When the dead load exceeds 25 psf and the live load does not exceed 100 psf, the reduction shall be not more than the least of the following three criteria:

60 per cent,

0.08 per cent for each square foot of area supported,

100 per cent times (dead load psf plus live load psf) divided by (4.33 times live load psf).

No reduction is permitted for snow loads.

1979 d—For columns, girders supporting columns, bearing walls, and foundation walls, supporting 150 square feet or more of roof area or floor area per floor, the uniformly distributed live loads on these members shall be not less than the following percentages of the total live loads on the following levels:

80 per cent on the roof;
80 per cent on the floor immediately below the roof;
80 per cent on the second floor below the roof;
75 per cent on the third floor below the roof;
70 per cent on the fourth floor below the roof.

No reduction is permitted for snow loads.

A 304-2.2 (633.2b) Uniformly Distributed and Concentrated Live Loads

Uniformly distributed and concentrated live loads shall be the greatest loads produced by the intended occupancy and use, but in no case less than the minimum live load in conformity with table A 304-2.2. Where a concentrated load is not given, load shall be at least 250 pounds on an area 1 inch in diameter. Other concentrated loads shall be applied as follows: 150 pounds on an area 1 inch in diameter; 200 pounds on an area 1 inch in diameter; 2000 pounds on an area 30 inches square.

TABLE A 304-2.2 (I-633)—UNIFORMLY DISTRIBUTED AND CONCENTRATED LIVE LOADS

Occupancy or use	Uniformly distributed loads, psf	Concentrated loads in pounds
First floor of each dwelling unit	40	
Other floors	30	
Stair treads	75[1]	
Attics:		
Accessible by stair or ladder in areas where the ceiling height is:		
4 feet 6 inches or more	30	
less than 4 feet 6 inches	20	150
Accessible by scuttle or means other than a stair, and of such height that household goods may be stored therein	20	150
Inaccessible (load for emergency access)	10	
Roofs used as promenades	30	
Other roofs	([2])	200
Garages for passenger cars	50	2,000[3]

[1]Stringers of stairs need be designed only for uniform load.
[2]For minimum imposed load, see section A 304-10c.
[3]Or actual wheel load increased 50 per cent for impact, whichever is larger.

1979

A 304-3 (633.3) Snow Loads

a—Minimum snow loads shall be in accordance with table

A 304-3 and the snow map below, and shall be applied normal to the roof surface.

b—Minimum snow loads shown in table A 304-3 and the snow map below shall be:

Increased due to nonuniform accumulation on pitched or curved roofs.

Increased in the valleys formed by multiple series roofs.

Increased due to snow sliding off sloping roof areas onto adjacent roof areas.

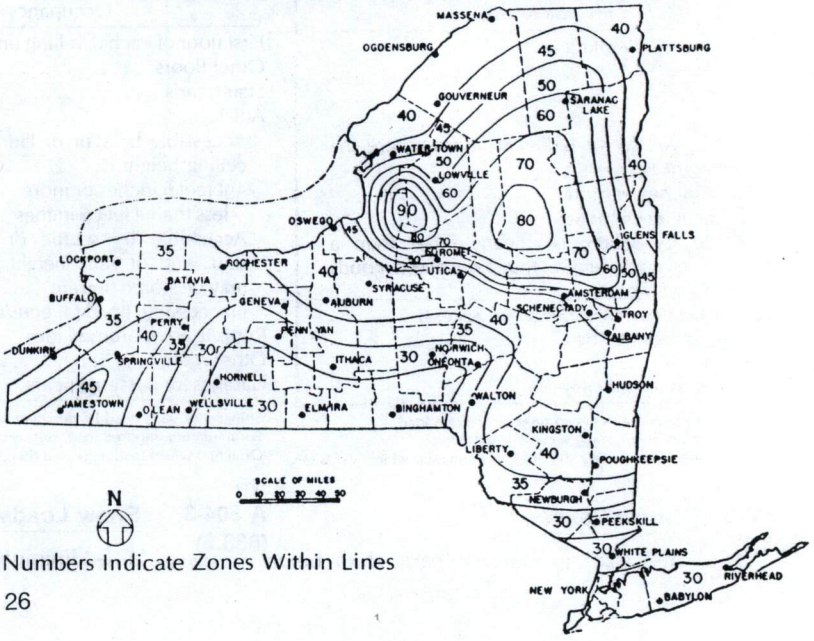
Increased due to drifting snow on the lower levels of multi-level roofs and on roof areas adjacent to projections.

TABLE A 304-3. (II-633)—SNOW LOADS[1]
In pounds per square foot

Zone numbers on snow map	Roof slope from horizontal[2]					
	0°	20°	30°	40°	50°	60° or more
30	30	27	17	9	3	0
35	35	31	20	10	4	0
40	40	35	23	12	4	0
45	45	40	25	13	5	0
50	50	44	28	15	5	0
60	60	53	34	18	6	0
70[3]						
80[3]						
90[3]						

[1]For minimum imposed loads see section A 304-10c.
[2]For slopes between those tabulated, compute loads by straight-line interpolation.
[3]For snow zones 70, 80, and 90 on snow map, use same tabular values as for zone 60.

SNOW MAP OF NEW YORK STATE



Numbers Indicate Zones Within Lines

A 304-4 (633.4) Wind Loads

Minimum wind loads shall be in conformity with tables A 304-4a and A 304-4b, and shall be applied normal to the surface. These loads are based on a design wind velocity of 75 miles per hour at a height of 30 feet above grade level.

TABLE A 304-4a. (III-633)—WIND LOADS: WALLS, EAVES, AND CORNICES[1]
In pounds per square foot

At height above grade in feet	Walls	Eaves and cornices[2]
26 to 40	18	36
0 to 25	15	30

[1]Exterior walls, shall be capable of withstanding wind load on both the interior and exterior surfaces, acting non-simultaneously.
[2]Load acting upward.

TABLE A 304-4b. (IV-633)—WIND LOADS: ROOFS
In pounds per square foot

Mean elevation of roof above grade level in feet	Direction of load[1]	Slope from horizontal[2]			
		0° to 20°	20° to 30°	30° to 60°	Over 60°
21 to 40	Downward	5	5	5 to 14	14
	Upward	17	17 to 14	14	14
0 to 20	Downward	5	5	5 to 11	11
	Upward	14	14 to 11	11	11

[1]Downward and upward loads act non-simultaneously.
[2]For slopes between 20° and 30° with wind acting upward, and between 30° and 60° with wind acting downward, compute loads by straight-line interpolation.

A 304-5 (633.5) Overturning Force and Moment Due to Wind

a—The overturning force shall be the wind load. The wind load shall be the load set forth in table A 304-4a, and shall be applied only to the windward vertical surface above the horizontal plane under consideration, and to the rise of the roof. The resisting force shall be the dead load of the structure above the horizontal plane under consideration, plus the strength of material and fastenings establishing continuity with the structure below.

b—The moments of stability and overturning shall be computed about the leeward edge of the horizontal plane under consideration.

c—The moment of stability of the structure above the horizontal plane under consideration shall be not less than 1½ times the overturning moment due to wind.

A 304-6 (633.6) Sliding Force Due to Wind

The sliding force due to wind load, equal to the over-turning force, determined in conformity with section A 304-5, shall be

resisted by the dead load of the structure above the horizontal plane under consideration, by anchors, and where applicable, by soil friction, providing a total resisting force equal to not less than 1½ times the sliding force. Anchors used to resist overturning may also provide resistance to sliding.

A 304-7 (633.7) **Uplift Force**

Uplift force due to wind or hydrostatic head shall be resisted by dead load, acting directly or through anchors or fastenings, equal to not less than 1¼ times the uplift force.

A 304-8 (633.8) **Soil Pressures and Hydrostatic Head Loads**

A 304-8.1 (633.8a) **General**

Retaining walls and parts of the building below ground shall be designed to withstand the following loads, if applicable, and such loads shall be in addition to other imposed loads: lateral load, from adjacent soil; lateral load, from hydrostatic head; lateral load, from surcharge of fixed or moving loads; uplift from hydrostatic head.

A 304-8.2 (633.8b) **Freestanding Retaining Walls**

a—The moments of stability and overturning shall be computed about the bottom base edge on the low earth side. The moment of stability shall be not less than 1½ times the overturning moment.

b—The resisting force due to soil friction shall be not less than 1½ times the sliding force.

A 304-9 (633.9) **Horizontal Impact Loads**

a—Nonbearing partitions enclosing dwelling units shall be designed to resist without displacement at top or bottom a minimum linear load of 10 pounds per foot, applied at mid-height.

b—Parapet walls and railings, including handrailings both interior and exterior, shall be designed to resist a lateral impact at the top equivalent to a minimum linear load of 50 pounds per foot.

A 304-10 (633.10) **Combined Loads**

a—The stress due to wind may be ignored if it is less than one third of the stress due to dead load plus imposed load excluding wind load.

b—If the stress due to wind exceeds one third of the stress due to dead load plus imposed load excluding wind load, the

allowable stress of the material may be increased by one third.
c—On roofs, the slope of which is such that the snow plus wind loads total less than 20 psf perpendicular to the roof surface, the minimum imposed load shall be 20 psf.
d—On roofs and eaves, snow or live load, and the wind load, shall be considered as acting simultaneously in such combination as imposes the greater stress.

A 304-11 (633.11) Elevator Machine Loads

The loads on, and the safe working stresses and permissible deflections of, the supports of elevator machines and guide-rail brackets, shall be in conformity with generally accepted standards.

A 304-12 (633.12) Loads Imposed During Construction or Demolition

Loads imposed during construction or demolition on flooring, structural members, walls, bracing, scaffolding, sidewalk sheds or bridges, hoists and temporary supports of any kind incidental to the erection, alteration or repair of any structure shall not subject the structure, or elements thereof, to loads beyond the design capacity.

A 305 (634) ANALYSIS AND TEST OF STRUCTURAL ASSEMBLIES

The capacity of an assembly to sustain dead and imposed loads without exceeding the allowable stresses shall be determined by any one of the following procedures, or by an approved combination thereof.
a—**Design analysis** in conformity with generally accepted engineering practice to establish that stresses in component structural material will not exceed safe working stresses defined in generally accepted standards, or in the absence of such standards, exceed safe working stresses interpreted and established from test results with due consideration given to the reliability, durability, and uniformity of the material and its behavior under stress. In no case shall the assigned safe working stress exceed two thirds of the yield strength nor one half of the ultimate strength of the material unless specifically permitted in section A 304-10. When safe working stresses are assigned to a material, the structural characteristics and reasonable uniformity of the material, as utilized, shall be assured by conformity with generally accepted standards.
b—**Tests** made in conformity with generally accepted standards of assemblies truly representative of the construction to be used, in order to establish that such assemblies conform to the performance criteria set forth in section A 306.
c—**Comparison** with an approved assembly of known characteristics and behavior under load, which assembly is directly

comparable, in all essential characteristics, to the assembly under consideration.

A 306 (635) PERFORMANCE CRITERIA UNDER TEST

A 306-1 (635.1) General Requirements

Buildings and their structural components subject to this Code shall, when submitted to the tests set forth in this section, meet the performance criteria prescribed for each test. Failure to meet the test criteria shall be evidence of noncompliance with this Code.

A 306-2 (635.2) Under Imposed Load

When the assembly reacts by bending under the uniformly distributed imposed load, excluding impact, the deflection shall not exceed 1/360 of the span when the inside is to be plastered. When the inside is not to be plastered, the deflection shall not exceed 1/240 of the span. When a roof is not to be used as a promenade, and the underside is not to be plastered, the deflection shall not exceed 1/180 of the span.

A 306-3 (635.3) Under 1½ Times Imposed Load

a—Under its dead load and 1½ times the uniformly distributed imposed load, excluding impact, the assembly shall sustain the load without structural damage. In testing floor assemblies and assemblies in compression, the load shall be applied twice.

b—For floor assemblies, the residual deflection from first application of the load shall not exceed 25 per cent of the maximum deflection under load. After the second application of the load, the total residual deflection shall be not more than 1.1 times the residual deflection resulting from the first application of the load.

A 306-4 (635.4) Under Two Times Imposed Load

Under its dead load and two times the uniformly distributed imposed load, excluding impact, the floor, roof, and wall assembly shall sustain load without structural failure, for a minimum of 24 hours.

A 306-5 (635.5) Impact Loads

Under an impact load of 60 pounds falling 4 feet for floors, 1½ feet for walls, roofs and nonbearing partitions enclosing dwelling units, on an area 10 inches in diameter, applied perpendicular to the assembly at its center, the assembly shall sustain no structural damage.

A 306-6 (635.6) **Racking Loads**

Where exterior walls and partitions react by racking, the racking deformation, while the assembly is sustaining the imposed load, shall not exceed 1/400 of the height of the wall. Under 1½ times the load there shall be no structural damage, and under two times the load there shall be no structural failure.

A 306-7 (635.7) **Transmitted Loads**

Fastenings and connections shall be capable of transmitting, without failure, twice the loads for which they are designed.

A 307 (636) **EXTERIOR PROTECTION**

A 307-1 (636.1) **General Requirements**

Whenever structural materials or assemblies are subject to deterioration and may become structurally unsound under the proposed condition of use, adequate protection shall be provided.

A 307-2 (636.2) **Exterior Materials**

The exterior facing or covering of walls and roofs shall be resistant to the causes of deterioration as set forth in section A 301c, without loss of strength or attachment which may render it unfit for use. The materials of such exterior facing or covering shall be treated if necessary to give the required protection.

A 307-3 (636.3) **Flashing**

Whenever water can penetrate the exterior or cause damage to the interior of the assembly or structure, flashing or other barrier shall be provided to prevent its entrance or to redirect it outward.

A 307-4 (636.4) **Waterproofing**

a—Foundation walls of cellars and basements, and floors in contact with the soil, shall be constructed or treated so as to prevent the penetration of ground and surface water.

b—Metallic structural elements in exterior walls not inherently corrosion resistant shall be protected against the effects of rain and moisture.

A 307-5 (636.5) **Grade Protection**

Materials and assemblies subject to deterioration when in continued contact with surface water or melting snow, shall be treated so as to withstand such deterioration, or be placed so that they will not be in contact with such elements.

A 308
(637)

PROTECTION FROM DESTRUCTIVE INSECTS

Where local conditions require protection against termites and other destructive insects, the construction, soil treatment, and protection of openings shall prevent their access to vulnerable parts of the structure, in conformity with generally accepted standards.

A 309
(638)

MATERIALS REQUIREMENTS

All structural units of natural or manufactured materials shall comply with applicable specifications of authoritative agencies, or shall be subject to test in conformity with generally accepted standards in order to determine their characteristics.

1981
A 310
(639)

WOOD FOUNDATION

a—The foundation of a one-family dwelling of type 5 construction is permitted to be constructed of preservative treated wood where the soil characteristics have been proven to be suitable for a wood foundation, subject to approval from the local authority having jurisdiction that the adequacy of the site and soil for a wood foundation has been determined. The material, design and construction of such foundation including the pressure treated wood, moisture and drainage control, and corrosion resistant fasteners shall conform to the generally accepted standards applicable to wood foundations.

b—A concrete basement or cellar slab, concrete steps or landing, exterior masonry veneer or masonry fireplace are permitted but shall not be supported by the wood foundation.

c—The preservative treated wood shall be permanently and legibly marked to identify that it conforms to the generally accepted standard applicable to pressure treated wood used for ground contact in residential foundations. Wood cut after treatment shall have preservative applied to the cut surfaces.

d—An interior thermal barrier, vapor barrier and smoke detector shall be installed in the cellar or basement as set forth in section A 407.

Part 4

Fire-Safety Requirements

A 401 (645) PREVENTION OF EXTERIOR FIRE SPREAD

A 401-1 (645.1) General Requirements

In order to retard the spread of fire, dwellings and accessory structures shall be located and constructed so that the distance between buildings and the fire resistance of exterior walls and of roof coverings are commensurate with the fire hazard involved.

A 401-2 (645.2) Determination of Fire Hazard

A 401-2.1 (645.2a) Within Fire Limits

When fire limits are established by municipalities, such fire limits shall, for the purposes of this Code, be designated as follows:

Fire limits A comprising the areas containing highly congested business, commercial and, or industrial occupancies, wherein the fire hazard is severe, and, or

Fire limits B comprising the areas containing residential, business and, or commercial occupancies, or in which such uses are developing, wherein the fire hazard is moderate.

A 401-2.2 (645.2b) Outside the Fire Limits

All those areas not included in fire limits A or B are designated herein as outside the fire limits.

A 401-2.3 (645.2c) Municipalities Having Fire Limits

In municipalities which designate fire limits, dwellings and accessory structures within such fire limits shall be constructed in conformity with the requirements set forth in section A 401 applicable to buildings within such fire limits. In such municipalities, dwellings and accessory structures outside such fire limits shall be constructed in conformity with the requirements set forth in section A 401 applicable to buildings outside the fire limits.

A 401-2.4 (645.2d) Municipalities Having No Fire Limits

Dwellings and accessory structures located in municipalities which do not designate any area or areas as a fire limit shall be constructed in conformity with the requirements set forth in sectin A 401 applicable to buildings outside the fire limits.

A 401-3 (645.3) Distance Separations

A 401-3.1 (645.3a) How Measured

Distance separation shall be the clear distance measured between the exterior walls of two buildings on the same premises, or from an exterior wall of a building to an interior lot line.

A 401-3.2 (645.3b) When Required

a—Distance separations set forth in table A 401-3.2 shall be required except as provided in paragraphs b and e of this section.

b—Distance separations shall not be required between buildings on the same premises when either building is one story in height and has an area of not more than 100 square feet.

c—Exterior walls or portions thereof may encroach upon the distance separation required by a type of construction, provided those portions of such walls which encroach are built of the higher type of construction imposed by the lesser distance separation.

d—Where the heights or construction of the exterior walls of the proposed and existing buildings are not the same, the applicable distance separation shall be that set forth for the building having exterior walls with the lower fire-resisting rating, whichever is the greater distance.

e—An open breezeway with at least 5 feet between the dwelling and garage shall be acceptable as distance separation as set forth in section A 402-3.6.

f—Where zoning regulations and this Code contain distance requirements applicable to the same structure, the greater distance shall control.

A 401-3.3 (645.3c) Construction Limitations Within Fire Limits

a—Buildings within fire limits A may be of any type of construction other than type 5 providing they conform to the fire-area limitations set forth in section A 204 including table A 204.

b—Buildings within fire limits B may be of any type of construction other than that having combustible walls with a fire-resistance rating of less than ¾ hour providing they conform to the fire-area limitations set forth in section A 204 including table A 204.

c—Open porches, verandas, and balconies or enclosed porches with at least 60 per cent of glazed area on three sides, may be constructed of combustible materials provided they do not extend outward more than 10 feet from the building, or upward more than 4 feet above the ceiling of the second story, and are not less than 3 feet distant at any point from a lot line or from similar appurtenances on another building; if they exceed said limitations, they shall be constructed of noncombustible materials.

TABLE A 401-3.2(I-645)—MINIMUM DISTANCE SEPARATIONS
In feet

Fire limits	Height in stories	Noncombustible walls with fire-resistance ratings of—		Combustible walls with noncombustible exterior facings giving protection of—		Combustible walls with combustible exterior facings
		At least ¾ hour	Less than ¾ hour	At least ¾ hour	Less than ¾ hour	
Within fire limits A	1	0	5[1]	np	np	np
	2	0	8	np	np	np
	3	0	np	np	np	np
	4 or more	0	np	np	np	np
Within fire limits B	1	0	3[1]	3[1]	np	np
	2	0	4	4	np	np
	3	0	5	np	np	np
	4 or more	0	np	np	np	np
Outside the fire limits	1	0	2[1]	0	3[1]	4[1]
	2	0	3	0	4	5
	3	0	4	0	5	6
	4 or more	0	np	np	np	np

[1]The minimum distance separation between adjacent one-story private garages of this type of construction not exceeding 750 square feet in area may be 1½ feet.

A 401-3.4 (645.3d) Construction Limitations Outside the Fire Limits

a—Buildings may be of any type of construction providing they conform to the fire-area limitations set forth in section A 204 including table A 204.

b—Porches, verandas, and balconies of combustible construction shall be not less than 3 feet distant at any point from a lot line or from similar appurtenances on another building.

A 401-4 (645.4) Protection of Openings in Exterior Walls

A 401-4.1 (645.4a) General Requirements

Exterior wall openings located less than 2 feet from an interior lot line shall be equipped with opening protectives.

A 401-4.2 (645.4b) Fire Resistance of Exterior Wall Opening Protectives

Fire-resistance ratings of required exterior wall opening protectives shall be at least ¾ hour.

A 401-5 (645.5) Eaves, Cornices, and Trim

a—Eaves and main exterior cornices may project beyond the building face not more than one third of the required distance separation, but this regulation shall not be deemed to authorize any projection beyond the lot line.

b—Building trim may project beyond the building face not more than one sixth of the required distance separation, but this regulation shall not be deemed to authorize any projection beyond the lot line.

c—Eaves, cornices and exterior trim shall be of noncombustible materials when the distance between such eaves, cornices or trim of adjoining buildings is less than 3 feet.

A 401-6 (645.6) Roof Coverings

Roof coverings shall be capable of resisting fire commensurate with the severity of exposure and shall be installed in conformity with generally accepted standards.

A 401-6.1 (645.6a) Classification

Roof coverings shall be classified on the basis of their resistance to exterior fire exposure as determined by tests made in conformity with generally accepted standards, as follows:

Class 1, 2, or 3 roof coverings are those which are capable of resisting severe, moderate, or light fire exposure, respectively, and which do not give off flying brands.

Class 4 roof coverings are those which are moderately effective in resisting light fire exposure, afford a slight degree of heat insulation to the roof deck, and are likely to give off flying brands.

A 401-6.2 (645.6b) Limitation of Use

a—Within the fire limits, roof coverings shall be Class 1, 2 or 3; except that where the distance separation between buildings is more than 10 feet and the horizontal projected area of the roof does not exceed 500 square feet, class 4 roof coverings may be used.

b—Outside the fire limits, roof coverings shall be class 1, 2, or 3; except that where the distance separation between buildings is more than 10 feet, class 4 roof coverings or wood shingles may be used.

A 401-6.3 (645.6c) Skylights

a—Skylights and roof panels shall conform to the requirements for roof coverings as set forth in section A 401-6, except as provided in section A 401-6.3.

b—Skylights and roof panels in roofs are permitted to be glazed with plastic as set forth in section A 404, provided each skylight or panel does not exceed 200 square feet in area, and that the distance between them is at least 5 feet.

c—Skylights and roof panels shall be mounted above the plane of the roof.

A 401-7 (645.7) **Parapet Walls**

Parapet walls at least 6 inches in height shall be provided on fire and party walls required to extend through the roof.

A 401-8 (645.8) **Party Walls**

a—Where buildings are joined at a common lot line, such buildings shall be separated by party walls in conformity with the requirements set forth in this section.

b—Openings shall not be permitted in party walls.

A 401-8.1 (645.8b) **Construction**

a—Party walls shall form a continuous fire and smoke barrier between adjoining buildings from foundation to or through the roof, and in the event of removal or collapse of construction on one side shall not endanger the support of construction on the opposite side, and shall be capable of serving as exterior walls.

b—Party walls shall be constructed of noncombustible materials and shall extend not less than 6 inches above roofs of combustible construction. When a roof is of noncombustible construction for a distance of at least 18 inches on each side of the wall, a party wall may terminate at the underside of the roof providing the junction of the wall and roof is made smoketight.

c—Party walls shall be made smoketight at their junction with exterior walls and the exterior wall shall be protected with noncombustible construction for a distance of at least 18 inches on each side of the party wall. In lieu of such protection at the end of party walls in type 5 construction, the party wall shall project through the exterior wall at least 6 inches.

d—Where combustible members, such as joists and beams, are framed into party walls, such combustible members shall not extend through the wall but shall have at least 4 inches of solid noncombustible material below and at the sides and ends of such members.

A 401-8.2 (645.8c) **Fire Resistance**

a—The fire-resistance rating of party walls between one-story one- and two-family dwellings without a basement shall be at least 1 hour.

b—The fire-resistance rating of party walls between one- and two-family dwellings shall be at least 2 hours, except as set forth in paragraph a of this section.

c—The fire-resistance ratings of party walls between one- and two-family dwellings and buildings containing nonresidential occupancies of low, moderate or high hazard classification shall be at least 2, 3 or 4 hours respectively.

A 402 (646) PREVENTION OF INTERIOR FIRE SPREAD

A 402-1 (646.1) General Requirements

Buildings shall be constructed, arranged and separated into fire areas so as to confine and restrict the spread of fire.

A 402-2 (646.2) Fire Walls

The floor area of buildings shall be divided by fire walls into fire areas in accordance with section A 204 including table A 204.

A 402-2.1 (646.2a) Construction

a—Fire walls shall form a continuous fire and smoke barrier between fire areas from foundation to or through the roof, and the removal or collapse of construction on one side shall not endanger the support of construction on the opposite side.

b—Fire walls shall be constructed of noncombustible materials and shall extend not less than 6 inches above roofs of combustible construction. Where a roof is of noncombustible construction for a distance of at least 18 inches on each side of the wall, a fire wall may terminate at the underside of the roof providing the junction of the wall and roof is made smoketight.

c—Fire walls shall be made smoketight at their junction with exterior walls. In type 5 construction, the exterior walls shall be protected with noncombustible construction of the same fire-resistance rating as the fire walls for a distance of at least 18 inches on each side of the fire wall, or the fire wall shall project through the exterior wall at least 6 inches.

d—Where combustible members, such as joists and beams, are framed into fire walls, such combustible members shall not extend through the wall but shall have at least 4 inches of solid noncombustible material below and at the sides and ends of such members.

A 402-2.2 (646.2b) Fire Resistance

a—The fire-resistance rating of fire walls in one-story one- and two-family dwellings without a basement shall be at least 1 hour.

b—The fire-resistance rating of fire walls in one- and two-family dwellings more than one story in height shall be at least 2 hours, except that in buildings more than 2 stories in height the fire-resistance rating for that portion of the wall extending through a basement, cellar, or the lowest story of such buildings which do not have a basement or cellar shall be at least 3 hours.

A 402-3 (646.3) Division by Fire Separations

A 402-3.1 (646.3a) Separation Between Dwelling Units

Separation between dwelling units shall have a fire-resistance rating of at least ¾ hour.

A 402-3.2 (646.3b) Separation of Mixed Occupancies

Nonresidential occupancies in or attached to a one- or two-family dwelling, not accessory thereto, shall be separated from the dwelling occupancy by fire separations having fire-resistance ratings in conformity with the requirements of table A 402-3.

[1981]TABLE A 402-3. (I-646)—MINIMUM FIRE SEPARATION REQUIRED BETWEEN OCCUPANCIES
(Fire-resistance ratings in hours)

Occupancy		One- and Two-Family Dwellings
Business	(C1)	1
Mercantile	(C2)	1
Industrial	(C3.1)	2
	(C3.2)	2
	(C3.3)	np
Storage	(C4.1)	2
	(C4.2)	2
	(C4.3)	np
Assembly	(C5.1)	2
	(C5.2)	3
	(C5.3)	4
	(C5.4)	2
	(C5.5)	2
Institutional	(C6.1)	2[1]
	(C6.2)	2[1]
	(C6.3)	2

[1]1-hour for day-care center in a building of Type 4b or Type 5 construction.

A 402-3.3 (646.3c) Construction

a—Fire separations and their supporting construction shall form a continuous fire and smoke barrier.

b—Fire separations between dwelling units and occupancies other than residential shall be continuous and any openings therein shall be protected with self-closing opening protectives.

A 402-3.4 (646.3d) Enclosure of Exits and Stairways

Exits, including stairways and passageways forming a part thereof, serving in common two dwelling units or passing through or adjoining another dwelling or any occupancy other than residential shall be separated therefrom by a fire separation having a fire-resistance rating of at least ¾ hour.

A 402-3.5 (646.3e) Enclosure of Heat Producing Equipment

a—Heat producing equipment shall be mounted on noncombustible floor construction, or on protected combustible floor

construction, shall be installed with sufficient clearance from adjacent wood and other combustible material to prevent their ignition; and when the ceiling above can be heated to temperatures in excess of 175°F., it shall be protected for a distance of 3 feet on all sides of the heat producing equipment by noncombustible material providing 10 minutes or more of fire protection, except when such ceiling is constructed of noncombustible material and has a fire-resistance rating of at least ¾ hour.

b—Where fuel-burning heat producing equipment is located at a level containing habitable space, the walls, floor and ceiling 3 feet or less from such equipment shall have a fire-resistance rating of at least ¾ hour and an interior finish providing at least 10 minutes of fire protection to the combustible members. Such protection shall not be required where tests made in conformity with generally accepted standard show that such heat producing equipment will not create a fire hazard or heat adjacent combustible material above 175°F. Where doors are provided for enclosed heater rooms they shall be self closing and finished or covered on the inside with noncombustible material.

c—Fuel burning heat producing equipment within a garage shall be protected from physical damage by vehicles.

d—Floor-mounted fuel burning heat producing equipment within a garage located below grade or within a below-grade space opening directly into a garage, shall be installed on a noncombustible platform not less than 18 inches above the floor.

A 402-3.6 (646.3f) Separations of Garages in, or Attached to, One- and Two-Family Dwellings

1980 a—Private garages in, or attached to, a dwelling shall be separated from other spaces in the building by construction having a fire-resistance rating of at least ¾ hour. Each opening in the separation between the garage and other space in the building shall be equipped with a self-closing door having a fire-resistance rating of at least ¾ hour. Such door shall not open directly into a room used for sleeping purposes.

b—Floors in garages shall be of noncombustible material that will not absorb flammable liquids and shall be placed or arranged so that heavier-than-air flammable vapors cannot spread to fixed sources of ignition.

c—Construction of garages and arrangement of equipment installations shall be such that toxic gases originating within garages shall not spread to the dwellings; nor shall air for heating or ventilation be circulated through garages to dwellings.

d—For purposes of this Code, a carport with no more than two enclosing walls, shall not be deemed to be a garage.

e—An open breezeway with at least 5 feet between the dwelling and garage shall be acceptable as separation between a garage and a one- or two-family dwelling providing a firestop is

provided between the roof and ceiling at the garage end of the breezeway.

[1980] f—Where a breezeway is less than 5 feet between the dwelling and garage, or is closed on the sides, the garage shall be fire protected as though in, or attached to the dwelling.

A 402-3.7 (646.3g) Openings in Fire Walls and Fire Separations

Openings in fire walls and fire separations shall be protected by opening protectives having fire-resistance ratings as set forth in table A 402-3.7.

TABLE A 402-3.7. (II-646)—OPENING PROTECTIVES FOR INTERIOR WALL OPENINGS

Fire-resistance rating of wall or separation in which opening occurs, in hours	Fire-resistance rating of opening protective, in hours
2 or more	1½
1 or ¾	¾

A 402-4 (646.4) Firestopping

A 402-4.1 (646.4a) General Requirements

Concealed spaces within wall, partition, floor, stair, attic, or cornice construction, and around chimney, pipe and duct openings in such construction, shall be firestopped to prevent the passage of flame, smoke, fumes, and hot gases.

A 402-4.2 (646.4b) Materials

a—Firestopping or fill shall be of nonflammable material which can be shaped, fitted and permanently secured in position.

b—Noncombustible fire stopping materials shall be used in buildings of type 1 and 2 construction, and also around fireplaces, flues and chimneys in buildings of all types of construction.

c—Combustible firestopping materials may be used in buildings of type 3, 4 and 5 construction.

d—Flammable materials shall not be permitted as insulation or fill in concealed or attic spaces.

A 402-4.3 (646.4c) Location

a—Concealed vertical spaces in walls and partitions shall be firestopped at each floor level and at the ceiling of the uppermost story so that such spaces will not be continuous for more than one story, or communicate with concealed horizontal spaces in the floor or roof construction.

b—When combustible materials form a part of the concealed

space between surface finish and the base to which they are applied, the concealed space shall be filled with noncombustible material, or be firestopped so that no dimension of such concealed space exceeds 8 feet vertically or 20 feet horizontally.

c—Space between floor joists with ceilings attached directly to the joists shall be firestopped for the full depth of the joists at all points of support, under supported walls and partitions having a required fire-resistance rating, and under all partitions separating dwelling units.

d—Concealed space in stairs shall be firestopped so as not to communicate at the top and bottom of the stairs with concealed space in the floor construction.

e—Exterior cornices and eaves shall be firestopped at the ends of fire and party walls, and at intervals of not more than 20 feet.

f—In buildings of type 3, 4, and 5 construction, the space in attics or between combustible floor or roof construction and a suspended ceiling, shall be firestopped so that no area of such concealed space shall be greater than 3000 square feet.

A 403 (647) INTERIOR FINISHES, TRIM AND DECORATIVE MATERIALS

A 403-1 (647.1) General Requirements

a—Interior finish materials for acoustical correction, surface insulation and decorative treatment on the surfaces of walls and ceilings, and interior trim materials, shall conform with all requirements set forth in this section.

b—Interior finish and trim shall be of materials that will not, in burning, give off excessive amounts of smoke or objectionable gases.

A 403-2 (647.2) Classification of Interior Finish Materials

Interior wall and ceiling finish materials shall be classified in accordance with their surface flame-spread ratings determined by tests conducted in conformity with generally accepted standards, and as follows:

Class	Surface flame-spread rating
A	0 to 25
B	26 to 75
C	76 to 200
D	201 to 500

A 403-3 (647.3) Use of Interior Finishes

a—Interior wall and ceiling finish materials in required enclosed exits shall be class A or B.

b—Interior wall and ceiling finish materials in any location other than in an enclosed exit shall be class A, B, or C.

A 404
(648)

PLASTIC MATERIALS

A 404-1
(648.1)

General Requirements

a——Plastic materials shall be classified in accordance with their burning characteristics as determined by tests conducted in conformity with generally accepted standards.

b——Plastic materials shall be identified by permanent legible markings on each piece in conformity with generally accepted standards.

c——The requirements of this section are limited to construction regulated by this Code and shall not regulate plastic materials as permitted in Part 5 of this Code.

d——Plastic materials which give off smoke or gas denser or more toxic than given off by untreated wood or paper under comparable exposure to heat or flame, or which burn faster than 2½ inches per minute as determined by tests conducted in conformity with generally accepted standards, shall not be permitted.

e——Plastic materials may be used as a roof over an unenclosed structure located at grade level, provided such roof does not exceed 10 feet in height and 1000 square feet in area.

f——Plastics for light transmission from artificial lighting equipment are not required to conform to the flame-spread ratings for interior finish.

g——One-story accessory structures located at grade level not exceeding 500 square feet in area and 10 feet in height, located outside of fire limits may be constructed of plastic materials provided the distance separation is at least 10 feet.

1979
A 404-2
(648.2)

Foam Plastic

a——Foam plastic insulation, except as set forth in paragraphs b and c of this section, shall have a surface flame spread rating no greater than 75 and a smoke density rating no greater than 450 and shall be permitted as follows:

Within the cavity of a concrete or masonry wall.

On the interior surface of concrete or masonry walls provided the foam plastic insulation is protected by a thermal barrier.

Within combustible wall, roof or floor/ceiling assemblies, that are not required to have a fire resistance rating, provided the foam plastic insulation is protected on the interior side by a thermal barrier.

As nonstructural sheathing for combustible exterior walls provided the wall cavity is insulated with noncombustible material covered by a thermal barrier on the interior side.

b——Foam plastic shall be permitted as a component of an approved built-up roof.

c——Foam plastic shall be permitted as an integral component within a wall, roof or floor/ceiling assembly, approved for the intended use.

A 405 (649) FIREPLACES

A 405-1 (649.1) General Requirements

Fireplaces and similar construction intended for burning fuel in open fires shall be designed and constructed of noncombustible material, shall be stable and structurally safe, shall be connected to chimneys in conformity with the requirements set forth in section A 505, and shall be insulated so that, when in use, nearby or adjacent combustible material and structural members shall not be heated to temperatures in excess of 175°F.

A 405-2 (649.2) Hearths and Linings

Hearths and linings or other parts of fireplaces exposed directly to flame shall be of materials that will not melt, disintegrate, spall, or shatter at temperatures up to 2000° F.

A 405-3 (649.3) Mantels and Trim

Wood mantels and trim on fireplaces shall be placed and attached so that they cannot be heated to temperatures in excess of 175° F. or ignited by sparks or embers from the fire.

1981

A 405-4 (649.4) Combustion Air Supply

An air intake with damper, as required by the State Energy Conservation Construction Code to provide a source of outside air of sufficient quantity to support combustion in the fireplace, shall be constructed of noncombustible material and shall be installed in a manner that will prevent the backflow of fire and products of combustion through such intake.

1976

A 406 (650.1) SINGLE-STATION SMOKE-DETECTING ALARM DEVICE

At least one single-station smoke-detecting alarm device, installed in conformity with section A 510, shall be provided adjacent to sleeping spaces on each floor level and shall be located on or near the ceiling.

1981

A 407 (651) INTERIOR PROTECTION FOR WOOD FOUNDATION

a—The interior surface of the wood foundation in a cellar or basement shall be covered with a noncombustible thermal barrier which shall provide fire protection for the foundation for at least 15 minutes. A vapor barrier shall be provided between the thermal barrier and the wood foundation.

b—At least one single station smoke-detecting alarm device shall be installed in the cellar or basement and shall comply with the requirements set forth in Section A 510.

Part 5

Equipment Requirements

A 501
(655)

GENERAL REQUIREMENTS FOR EQUIPMENT

a——Plumbing, heating, electrical, ventilating, and air conditioning equipment, elevators, and other mechanical additions, installations, or systems for the use of the building shall be designed, installed, and located so that under normal conditions of use such equipment and systems will not be a potential danger to health or welfare, a danger because of structural defects, or a source of ignition, and will not create excessive noise, or otherwise become a nuisance. Equipment and systems include, but are not limited to, apparatus, devices, fixtures, piping, pipe hangers, pipe covering, wiring, fittings, and materials used as part of, or in connection with, such installations.

b——Equipment and systems shall be made of approved materials, shall be free from defective workmanship, and shall be designed and installed so as to be durable, without need for frequent repairs or major replacements. Equipment requiring operation, inspection, or maintenance shall be located so that easy access to it is provided.

c——The design and installation of equipment and systems shall conform to the requirements of section A 107.

d——New installation of equipment in existing buildings, and alterations and extensions to existing equipment and systems, shall conform with the requirements of this Code.

e——Equipment and systems shall be subjected to such tests as are appropriate which will disclose defects and leaks. No equipment or part of a system shall be covered or concealed until it has been tested and approved.

f——Equipment and systems shall be capable of performing their functions satisfactorily without being forced to operate beyond the safe design capacity.

g——Equipment and systems subject to damage from freezing shall be adequately protected against freezing.

h——Moving parts of equipment which may be a potential hazard shall be guarded to protect against accidental contact.

A 502
(656)

PLUMBING

A 502-1
(656.1)

General Requirements

a——Plumbing systems shall conform with the requirements of section A 501 and shall be designed, constructed and maintained so as to guard against fouling, clogging, and depositing of solids.

b——Plumbing systems shall be installed in such manner as not to

weaken structural members nor cause damage or deterioration to any part of the building through fixture usage.

c—Plumbing systems shall be maintained in a sanitary and serviceable condition.

d—For implementation of the performance requirements for plumbing in this Part, see State Building Construction Code applicable to Plumbing.

A 502-2 (656.2) **Public Water Supply or Public Sewer: When Deemed Available**

a—The source of water supply for a dwelling shall be a public water supply system when such system is within 100 feet of the premises on which the dwelling is located, measured along a street, and a connection may be made lawfully thereto.

b—The means of sewage disposal for a dwelling shall be a public sanitary or combined sewer system when it is within 100 feet of the premises on which the dwelling is located, measured along a street, and a connection may be made lawfully thereto.

c—The means for storm water disposal shall be a public storm or combined sewer system when it is within 100 feet of the premises on which the dwelling is located, measured along a street, and a connection may be made lawfully thereto.

A 502-3 (656.3) **Water Supply**

a—Pure and wholesome water from an approved source shall be available at all times on the premises of every dwelling. The domestic water supply system of the dwelling shall be connected to such approved source, and shall not be subject to contamination. When supplied from a public source, the potable water supply system shall not be connected to private or unsafe water supplies.

b—Water supply systems shall be designed and installed so as to provide at all times a supply of water to plumbing fixtures, devices and appurtenances in sufficient volume and at pressures adequate to enable them to function satisfactorily and without undue noise under all normal conditions of use.

c—Water supply systems shall be designed and installed so that water used for purposes of cooling or heating shall not be reintroduced into the domestic water supply system nor be distributed through such equipment to plumbing fixtures.

d—Hot water supply systems shall be provided with safety devices arranged to relieve hazardous pressures and excessive temperatures.

A 502-4 (656.4) **Sewage Drainage System**

a—Every plumbing fixture shall be drained to a sewage drainage system and such system shall be connected to a public sewer

or to an adequate and approved system of sewage disposal.

b——Every dwelling shall have access on the premises to an adequate and approved means of sewage disposal.

c——Where a public sewer is not available, a system shall be provided to receive and dispose of sewage without health hazard or nuisance.

d——Sewage or other waste which may be deleterious to surface or subsurface waters, shall not be discharged into the ground or into a waterway unless it has first been rendered harmless through subjection to treatment in conformity with generally accepted standards.

e——Where a drainage system may be subject to backwater, suitable provisions shall be made to prevent its overflow into the building.

f——Any substance which will clog the pipes, produce explosive mixtures, destroy the pipes or their joints or interfere unduly with the sewage disposal process, shall be prevented from entering the building drainage system.

g——Each fixture directly connected to the sewage drainage system shall be equipped with a water seal trap.

h——Adequate cleanouts shall be provided and arranged so that the pipes may be readily cleaned.

i——The drainage system shall be designed so as to provide adequate circulation of air in all pipes in order that siphonage, aspiration, or pressure will not cause a loss of trap seal under ordinary conditions of use.

j——Each vent terminal shall extend to the outer air and be installed so as to minimize the possibilities of clogging, frost closure, the return of foul air to the building, or the creation of a nuisance to adjacent premises.

k——Whenever a structure is to be built higher than the vent terminal of an adjacent building and thereby adversely affects the vent system of the adjacent building or when such vent is a potential nuisance to the occupants of the higher structure, then the owner of the higher structure shall at his expense and with the consent of the owner of the adjacent building, cause such vent to be extended or altered to correct the condition.

l——Drains provided for fixtures, devices, appliances, or apparatus containing food, water, sterile goods or similar materials, shall be equipped with air breaks.

m——Drains provided for fixtures, devices, appliances or apparatus which have interior surfaces not readily accessible to permit effective cleaning, shall be indirectly connected.

A 502-5 (656.5)

Storm Drainage

a——Roofs and paved areas, including yards and courts, shall be drained. Storm drainage shall be conveyed to an adequate and

approved system of storm water disposal where available. Storm drains shall be discharged in such manner that water will not flow onto sidewalks.

b—Where a drainage system may be subject to backwater, suitable provision shall be made to prevent its overflow into the building.

c—Leaders and gutters, if used, shall be constructed of non-combustible material, except that wood leaders and gutters may be used for buildings not more than three stories high.

A 502-6 (656.6) Minimum Plumbing Facilities

a—Each dwelling shall be provided with a plumbing system designed to dispose of the sewage from all fixtures and to furnish cold water to every water closet, and hot and cold water to every sink, lavatory, bathtub and shower required therein, except that hot water need not be furnished unless required by law.

b—There shall be provided within each dwelling unit at least:

One kitchen sink,
One water closet,
One bathtub or shower, and
One lavatory.

A 502-7 (656.7) Plumbing Fixtures

a—Plumbing fixtures shall be made of smooth non-absorbent material and shall be free from concealed fouling surfaces.

b—Plumbing fixtures shall be installed with regard to spacing so as to be reasonably accessible for their intended use.

c—Plumbing fixtures shall be located in spaces that are accessible, lighted, and ventilated.

A 503 (657) FUEL GAS PIPING EQUIPMENT AND SYSTEMS

A 503-1 (657.1) General Requirements

a—Fuel gas piping systems shall be in conformity with the requirements of section A 501.

b—Fuel gas piping systems shall be of approved materials resistant to the corrosive effects of gases conveyed by them. Systems shall be designed and installed so as to remain gastight, safe and operative under conditions of use.

c—Gas piping shall not be installed in cinder fill or other corrosive material unless protected against corrosion.

d—Cleanouts shall be provided where condensate, dirt or other foreign matter may collect.

e—Fuel gas piping and equipment shall not be located in ducts, chimneys, flues, stairways, or exits.

f—Fuel gas piping systems shall be designed and installed so as

to provide a supply of gas sufficient to meet the maximum expected demand of the installed gas-burning appliances connected thereto.

A 503-2 (657.2) **Shutoff Valves**

a——Gas piping systems shall have at least one accessible means for shutting off all gas supply, except that systems supplied with gas at pressures exceeding 1 psi gage shall have at least two accessible means for shutting off all gas supply. Where two means are required, one means shall be located outside and at a safe distance from the building, and shall be suitably protected against unauthorized use, and the other shall be located ahead of the meter and as close as practicable to the point of service entrance.
b——An easily accessible shutoff valve or cock shall be provided in the piping in close proximity to, and ahead of, every gas appliance or outlet for a gas hose connection.

A 503-3 (657.3) **Service Equipment for Gas Supplied from Utility Mains**

a——Gas meters shall be located in spaces that are dry, well ventilated, readily accessible, and protected against extreme heat. Gas meters shall be located as near as practicable to the point of entry of the gas service.
b——Gas services, gas meters, and gas pressure regulators shall be located so that they are protected from damage. Such equipment shall be sufficiently removed or separated from the bottom termination of a stairway so as not to constitute a potential hazard.

A 503-4 (657.4) **Gas Refrigerators**

a——Gas refrigerators shall be installed with clearance for ventilation.
b——Refrigerator parts serving as flues shall be resistant to the action of the products of combustion.

A 503-5 (657.5) **High Pressure Gas**

a——Buildings supplied with gas from utility mains at pressures exceeding 1 psi gage shall have all exterior wall openings below grade and within 10 feet of the gas service pipe made gastight. Where such openings are provided for service pipes, the pipes shall be protected from damage by settlement or corrosion.
b——Any service connection supplying gas at a pressure in excess of 1 psi gage shall be provided with a device to reduce such pressure to not more than ½ psi gage prior to entering the meter.

A 503-6 (657.6) **Liquefied Petroleum Gas**

a——Undiluted liquified petroleum gas in liquid form shall not be permitted within buildings.

b—Liquefied petroleum gas shall not be vaporized by devices utilizing open flame or open electrical coil.

c—Where two or more containers are installed, connection shall be arranged so that containers can be replaced without shutting off the flow of gas to equipment.

d—Containers shall be designed, stored, and located so as not to be a hazard to the premises served, or to the surrounding property.

e—Gas service entrance shall be above ground, and shall be protected from damage by settlement or corrosion. Exposed exterior wall openings located below and within 5 feet horizontal distance of gas service entrance shall be made gastight.

f—Liquefied petroleum gases shall be odorized so that the presence of gas will be recognized by a distinctive odor when the concentration is equal to, or greater than, one fifth the lower limit of combustibility.

g—Systems shall be provided with safety devices to relieve excessive pressures, and shall be arranged so that the discharge terminates at a safe location.

h—Systems supplied from containers exceeding 125 gallons of capacity shall have at least two accessible means for shutting off the gas at the main supply. Shut-off valves shall be located in conformity with the requirements of section A 503-2a.

A 504 (658) HEATING

A 504-1 (658.1) General Requirements

a—Heating systems shall conform to the requirements of section A 501.

b—Dwellings intended for occupancy between the fifteenth day of September and the thirty-first day of May of the following year shall be provided with heating equipment designed to maintain a temperature of not less than 70°F. at a distance of 2 feet and more from exterior walls, and at a level of 5 feet above the floor, in habitable spaces, kitchenettes, bathrooms and toilet rooms. The capability of the heating equipment to maintain such indoor temperature shall be based on the average of the recorded annual minimum outside temperatures for the locality.

A 504-2 (658.2) Heat Producing Equipment

A 504-2.1 (658.2a) Combustion Space

Fuel-burning heat producing equipment shall have combustion space designed and constructed to withstand the maximum temperature attained.

A 504-2.2 (658.2b) Smoke Control

Fuel-burning heat producing equipment shall be designed and installed so that the emission or discharge into the atmosphere of smoke, dust, particles, odors, or other products of combustion will not create a nuisance or be detrimental to the health, comfort, safety or property of any person.

A 504-2.3 (658.2c) Warm Air Heating

Ducts and other air handling equipment used for heating shall conform to the requirements of such equipment used for ventilating purposes.

A 504-2.4 (658.2d) Prohibited Locations for Heat Producing Equipment

Fuel-burning water heaters shall not be located in sleeping rooms, bathrooms or toilet rooms.

A 504-2.5 (658.2e) Fuel Supply Connection

Fuel supply connection to heat producing equipment shall be made with pipe or tubing of solid metal or with means conforming to the requirements of generally accepted standards.

A 504-2.6 (658.2f) Installation and Clearance

a——Heat producing equipment shall be of the fixed type.

b——Where heat producing equipment is installed on, or adjacent to, combustible materials, the location, insulation, clearance, and the control of the equipment shall be such that the temperature on the surface of the combustible materials will not exceed 175°F.

A 504-2.7 (658.2g) Air Supply

a——Direct-fired heat producing equipment and the enclosure in which it is located shall be provided with a supply of air adequate both for complete combustion at the rated gross output of the equipment and for the ventilation of the enclosure to prevent the accumulation of heat.

b——Rooms containing fuel burning equipment shall have such air supply provided by means of one or more openings to the exterior, or by means of fixed openings to interior spaces which open to the exterior.

A 504-2.8 (658.2h) Removal of Products of Combustion

a——Equipment for burning solid or liquid fuel shall be connected to suitable chimneys or flues or vented as set forth in paragraph c of this section, and shall not be connected to gasvents.

b——Gas-fired space heating equipment shall be connected to a suitable chimney, flue or gasvent, or shall be vented as set forth

in paragraph c of this section. Gas-fired equipment other than space heaters shall be vented to the exterior when the discharge of products of combustion into the space where the equipment is installed would be a hazard.

c—Equipment having an integral venting system in which the inlet for combustion air and the outlet for products of combustion are connected directly to the exterior, shall be permitted without a chimney, flue or gasvent.

d—Equipment requiring mechanical draft shall have an interlock to shut off fuel supply when the venting system is inoperative.

e—Where a gasvent is permitted, a permanent sign stating the type of heating equipment which may be connected to the gasvent shall be provided and located where the gasvent passes through the wall or ceiling.

A 504-2.9 (658.2i) Safety Devices

a—Equipment capable of developing hazardous pressures or temperatures shall be provided with means to safely control such pressures or temperatures.

b—Controls for the safe operation of automatically operated heat producing equipment shall be provided to function as follows:

When failure or interruption of flame or ignition occurs, the fuel supply shall be cut off.

When a predetermined temperature or pressure is exceeded, the input of additional heat shall be prevented or reduced to a safe rate.

When the water level in a steam boiler drops below a predetermined level, the fuel supply shall be cut off.

When failure or interruption of pilot light or main burner of liquefied petroleum gas equipment occurs, the fuel supply to each pilot light and main burner shall be cut off.

A 504-2.10 (658.2j) Insulation

a—Insulation provided to reduce the rate of heat flow through building construction shall conform to the requirements of section A 501.

b—Insulation on surfaces of heat producing equipment shall be of noncombustible materials.

A 504-2.11 (658.2k) Expansion Tanks

Hot water heating systems shall be provided with expansion tanks or other means to allow for the expansion of water in the system.

A 505 (659) CHIMNEYS, FLUES, AND GASVENTS

A 505-1 (659.1) General Requirements

a—Chimneys, flues, gasvents and their supports shall be designed and constructed so as to be structurally safe, durable, smoketight, noncombustible, and capable of withstanding the action of flue gases without softening, cracking, corroding, or spalling.

b—Such facilities shall effectively convey the products of combustion to the outer air.

c—Masonry chimneys, except approved prefabricated chimneys, shall have noncombustible foundations.

d—Openings for smoke pipes or gasvent connections shall be provided with means for easy connection without restriction of flue.

e—Fuel burning equipment and fireplaces located in different tenancies shall not be connected to the same flue.

A 505-2 (659.2) Draft

a—Chimneys, flues, and gasvents or other draft producing devices installed on fuel-burning equipment, shall provide sufficient draft to develop the rated output of the connected equipment.

b—Gas-fired equipment operating on natural draft and connected to a chimney, flue or gasvent, shall be provided with a draft hood, except that draft hoods are not permitted on incinerators.

A 505-3 (659.3) Fire Safety

Chimneys, flues, and gasvents shall be located, designed and constructed so that under conditions of use, the temperature of any combustible materials adjacent thereto, insulated therefrom or in contact therewith, does not exceed 175°F.

A 505-4 (659.4) Location of Outlets

a—The horizontal distance separation between openable parts of a window and a chimney, flue or gasvent outlet which is below such opening shall be at least 15 feet for a chimney or flue, and 10 feet for a gasvent.

b—The vertical height of a chimney, flue or gasvent outlet shall be at least 2 feet above the roof where the flue passes through; and at least 2 feet higher than construction within 10 feet, except that reduced heights are permitted for gasvents not less than 8 feet from a vertical wall when tested for adequate performance in conformity with generally accepted standards.

c—The location of an outlet from an integral venting system

shall conform to the requirements of generally accepted standards.

A 506 (660) AIR CONDITIONING AND MECHANICAL VENTILATION

A 506-1 (660.1) General Requirements

a—Air conditioning and mechanical ventilating equipment shall conform to the requirements of section A 501.
b—Ducts shall be securely fastened in place, and shall be firestopped as set forth in section A 402-4.

A 506-2 (660.2) Ventilation Requirements

a—Required ventilation shall be provided in accordance with sections A 202-2 and A 203-3.
b—Exhaust air from a dwelling unit shall not be circulated to another dwelling unit.
c—Exhaust air from kitchens and nonhabitable spaces shall discharge directly to the exterior.

A 507 (661) EQUIPMENT FOR FUEL OIL

A 507-1 (661.1) General Requirements

Fuel oil for furnaces, boilers and automatically or remotely controlled oil burners shall be received, stored, and conveyed by means of fixed liquidtight equipment designed and installed in conformity with the requirements set forth in section A 501.

A 507-2 (661.2) Storage Tanks

a—Fuel oil storage tanks shall rest on noncombustible supports.
b—Tanks shall be protected against settling, sliding, or displacement because of buoyancy. Where located in areas subject to traffic, they shall be protected against physical damage.
c—Tanks shall be located at a safe distance from the property line.
d—Underground tanks shall be located so as not to receive any foundation load.
e—Tanks shall be provided with means for venting.
f—Fuel oil storage tanks inside of buildings shall be provided with liquid-level indicating devices of fixed vaportight construction.
g—Unenclosed fuel oil storage tanks inside of buildings shall have a maximum capacity of 550 gallons.

A 507-3 (661.3) Piping

a—Pipes for fuel oil entering buildings shall be protected from damage by settlement or corrosion.

b——Such pipes having discharge outlets located within buildings shall be provided with remote control to stop the flow during fire or other emergency.

c——Filling, emptying, and venting of tanks shall be by means of fixed piping. Pipes to underground tanks shall be pitched toward tanks. Terminals of fill and vent pipes shall be located outside buildings at a safe distance from building openings.

A 508 (662) ELECTRICAL WIRING AND EQUIPMENT

A 508-1 (662.1) General Requirements

1977 a——Electrical wiring and equipment shall conform to the requirements of section A 501, and shall be designed and installed so as not to be a potential source of ignition of combustible material or a potential source of electrical hazard. Terminal connections and connections involving dissimilar metals shall be made in an approved manner.

b——Metal roofs, veneers, and siding on buildings shall be made electrically continuous and shall be grounded as recommended in the generally accepted standards.

A 509 (663) ELEVATORS

A 509-1 (663.1) General Requirements

Elevators shall conform to the requirements of section A 501, and shall be designed and installed so as to be free from physical and fire hazards and so as to sustain safely the loads to which they are subject.

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A 510 (664) SINGLE-STATION SMOKE-DETECTING ALARM DEVICES

a——Single-station smoke-detecting alarm devices shall conform to the requirements of section A 501.

b——Such device shall be designed and installed so as to avoid dead air space, detect smoke and activate the alarm, be reasonably free from false alarm and provide visible indication that the alarm is energized.

c——The alarm shall be clearly audible in adjacent sleeping spaces with intervening doors closed.

d——The device shall be directly connected to the lighting circuit of the dwelling unit with no intervening wall switch. Cord-connected installations shall not be permitted.

Appendix

Guide for Metrication

To prepare for the conversion to the metric system, the State Building Construction Code herewith lists typical conversion factors for units currently in use in the Code.

The conversion factors are approximate and derived from ANSI Z 210.1-1976, "Metric Practice Guide."

U.S. Unit	Factor	Metric Equivalent	Metric Abbreviation
Fahrenheit	Subtract 32 and divide result by 1.8	Celsius	°C
inch	multiply by 25.4	millimeter	mm
foot	divide by 3.3	meter	m
square inch	multiply by 645	square millimeter	mm^2
square foot	divide by 10.8	square meter	m^2
pound	divide by 2.2	kilogram	kg
ton	multiply by 907	kilogram	kg
gallon	multiply by 3.8	liter	l
pound per foot	multiply by 14.6	newton/meter	N/m
inch per ton	multiply by 28	millimeter/ton	mm/ton
pound per square inch (psi)	divide by 14	kilogram per square centimeter	kg/cm^2
pound per square inch (psi)	multiply by 6900	pascal	Pa
pound per square foot (psf)	multiply by 4.9	kilogram per square meter	kg/m^2
pound per square foot (psf)	multiply by 48	pascal	Pa
feet per minute	divide by 200	meter per second	m/s
cubic feet per minute	multiply by $\frac{470}{1{,}000{,}000}$	cubic meter per second	m^3/s
gallon per minute	divide by 16	liter per second	l/s
Btu per hour	divide by 3.4	watt	w

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