MANUAL

FOR

N.J.A.C. 12:115, BUILDING CODE,

DO NOT CIRCULATE

Effective May 1, 1971

STATE OF NEW JERSEY
DEPARTMENT OF LABOR AND INDUSTRY.
Division of Labor.
Bureau of Engineering and Safety.
Trenton, New Jersey

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ARTICLE M-1

ADMINISTRATION

M-103.2 ACCEPTED ENGINEERING PRACTICE

The abbreviations used with the accepted engineering practices cited under the various section numbers of the Manual have the following meaning and are the accredited authoritative agencies issuing the standards and publications listed.

AA - ALUMINUM ASSOCIATION
750 Third Avenue
New York, New York 10017

AAMA - ARCHITECTURAL ALUMINUM MANUFACTURERS ASSOCIATION
35 East Wacker Drive
Chicago, Illinois 60601

ACI - AMERICAN CONCRETE INSTITUTE
P.O. Box 4754, Redford Station
22400 West Seven Mile Road
Detroit, Michigan 48219

A(I)A - AMERICAN INSURANCE ASSOCIATION
85 John Street
New York, New York 10038

AISC - AMERICAN INSTITUTE OF STEEL CONSTRUCTION
101 Park Avenue
New York, New York 10017

AISI - AMERICAN IRON AND STEEL INSTITUTE
150 East 42nd Street
New York, New York 10017

AITC - AMERICAN INSTITUTE OF TIMBER CONSTRUCTION
1700 K Street, N.W.
Washington, D. C. 20036

ANSI - AMERICAN NATIONAL STANDARDS INSTITUTE
1430 Broadway
New York, New York 10018

APA - AMERICAN PLYWOOD ASSOCIATION
1119 A Street
Tacoma, Washington 98401

ASHRAE - AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR CONDITIONING ENGINEERS
345 East 47th Street
New York, New York 10017

ASTM - AMERICAN SOCIETY FOR TESTING AND MATERIALS
1916 Race Street
Philadelphia, Pennsylvania 19103

AWPA - AMERICAN WOOD PRESERVERS ASSOCIATION
1012-14th Street, N.W., Suite 403
Washington, D. C. 20037

AWPI - AMERICAN WOOD PRESERVERS INSTITUTE
2600 Virginia Avenue, N.W.
Washington, D.C. 20005

AWS - AMERICAN WELDING SOCIETY
345 East 47th Street
New York, New York 10017

FM - FACTORY MUTUAL ENGINEERING CORPORATION
1151 Boston-Providence Turnpike
Norwood, Massachusetts 02062

FS - FEDERAL SPECIFICATIONS
Publications available from Superintendent of Documents,
Government Printing Office
Washington, D. C. 20234

MBMA - METAL BUILDING MANUFACTURERS ASSOCIATION
2130 Keith Building
Cleveland, Ohio 44115

MCA - MANUFACTURING CHEMISTS ASSOCIATION
1825 Connecticut Avenue, N.W.
Washington, D. C. 20006

NFPA - NATIONAL FIRE PROTECTION ASSOCIATION
60 Batterymarch Street
Boston, Massachusetts 02110

(N)FPA - NATIONAL FOREST PRODUCTS ASSOCIATION
1619 Massachusetts Avenue, N.W.
Washington, D. C. 20036

SCPI - STRUCTURAL CLAY PRODUCTS INSTITUTE
1750 Old Meadow Road
McLean, Virginia 22101

SHP - SOUTHERN HARDWOOD PRODUCERS, INC.
805 Sterick Building
Memphis, Tennessee 38103

TCA - TILE COUNCIL OF AMERICA
Research Center
Post Office Box 326
Princeton, New Jersey 08540

UL - UNDERWRITERS' LABORATORIES, INCORPORATED
207 East Ohio Street
Chicago, Illinois 60611

USDC - UNITED STATES DEPARTMENT OF COMMERCE
Publications available from Superintendent of Documents,
Government Printing Office
Washington, D. C. 20402

USFS - UNITED STATES FOREST SERVICE
Madison, Wisconsin 53705

VI - VERMICULITE INSTITUTE
208 South LaSalle Street
Chicago, Illinois 60604

WWPA - WESTERN WOOD PRODUCTS ASSOCIATION
700 Yeon Building
Portland, Oregon 97204

ARTICLE M-2

DEFINITIONS

FIRE RETARDANT LUMBER.

Fire Tests of Building Construction and Materials, ASTM E 119-1969
Fire Retardant Treatments of Building Materials, NFPA No. 703-1961
Structural Lumber - Fire Retardant Treatment, AWPA C 20B-1963
By Pressure Process
Plywood-Fire Retardant Treatment by Pressure Process, AWPA C 27B-1963

NONCOMBUSTIBLE

Surface Burning Characteristics of Building Materials, ASTM E 84-1968

ARTICLE M-3

OCCUPANCY AND CONSTRUCTION CLASSIFICATION

M-301.1 ALL USE GROUPS

The classification numbers assigned to reactivity, flammability and health hazard for materials as used shall be those defined in Identification of the Fire Hazards of Materials, NFPA No. 704M-1966.

M-301.2. EXTREME HIGH HAZARD - GROUP A-1.

All uses primarily involving the storage, sale, manufacturing or processing of materials having a reactivity number of 4; including among others:

Explosives manufacturing plants
Fireworks manufacturing plants
Methylethyl ketone peroxide storage
Pyrotechnics manufacturing

M-301.2.B HIGH HAZARD - GROUP A-2.

All uses primarily involving the storage, sale, manufacturing or processing of materials having a health number of 4, 3, or 2; a flammability number of 4, 3, or 2; or a reactivity number of 3 or 2; including among others:

Gas processes utilizing hydrogen, natural gas, ammonia, chlorine, phosgene, hydrogen sulfide, or methylene oxide.
Cereal, feed, flour and grist or pulverizing mills.
Cryogenic storage of methane.
Distilleries
Dusts creating explosion or toxic hazard.
Finishing operations with liquids with flash points below 100°F.
Gasoline bulk plants
Grain elevators.
Hydrogenation processes.
Liquefied petroleum gas charging and storage facilities.
Organic coating manufacturing operations.
Refineries and petro-chemical processes.
Waste paper shredding or sorting.
Whiskey warehouses.

M-301.3.A MODERATE HAZARD STORAGE - GROUP B-1.

All uses primarily involving the storage of materials having a health number of 1; a flammability number of 1; or a flammability number of 2 in small sealed containers; or a reactivity number of 1; including among others:

Lumber yards
Paper warehouses
Public garages
Tire warehouses
Warehouses for storage of liquids with flash points over 200°F.

M-301.3.B LOW HAZARD STORAGE - GROUP B-2.

All uses primarily involving the storage of materials having a health number of 0; a flammability number of 0; or a reactivity number of 0; including among others:

Abestos
Food products
Glass
Metals, except magnesium,
Porcelain and pottery
Talc and soapstones

M-301.5 INDUSTRIAL USE - GROUP D.

All uses primarily involving the manufacturing or processing of materials having a health number of 1 or less; a flammability number of 1 or less; or a reactivity number of 1 or less; including among others:

Assembly plants
Bakeries
Boiler works
Breweries
Canneries
Carpet and rug manufacturing
Clothing manufacturing
Creameries
Dry Cleaning using nonflammable solvents
Electric substations, electric light plants and power houses
Food products
Glass plants
Ice plants
Leather processing
Linoleum manufacturing
Metal workers
Motor Vehicle service and repair shops
Packing houses
Paper mills
Printing, lithographing, bookbinding
Pumping stations
Research centers
Sugar refineries
Textile mills
Tanneries
Water base paint finishing operations
Woodworking

ARTICLE M-4

GENERAL BUILDING RESTRICTIONS

M-402.5 MAXIMUM TOTAL AREA

The maximum increase in floor area for one story buildings under the combined provisions of 402.1, 402.2 and 402.3 of the Code shall not provide a total area in excess of Table M-402.5 for the various use groups and special types of construction.

TABLE M-402.5

USE GROUP	CONSTRUCTION TYPE	FLOOR AREA Square Feet
Hazardous	1A	35,000
	1B	27,500
	2A	17,500
	2B	15,000
	2C	8,750
	3A	15,000
	3B	12,500
	3C	8,750
	4A	7,500
	4B	not permitted
Moderate Hazard Storage, Assembly - Theaters, or Assembly Lecture Halls, Recreation Centers, Terminals	1A	Unrestricted
	1B	121,000
	2A	77,000
	2B	55,000
	2C	38,500
	3A	55,000
	3B	49,500
	3C	38,500
	4A	27,500
	4B	19,250
Low Hazard Storage or Business	1A	Unrestricted
	1B	Unrestricted
	2A	132,000 (1)
	2B	99,000 (1)
	2C	66,000 (1)
	3A	99,000
	3B	88,000
	3C	66,000
	4A	49,500
	4B	33,000

TABLE M-402.5 (continued)

USE GROUP	CONSTRUCTION TYPE	FLOOR AREA Square Feet
Mercantile, Industrial, Assembly - Churches,	1A	Unrestricted
	1B	137,500
	2A	88,000
	2B	66,000
	2C	44,000
	3A	66,000
	3B	55,000
	3C	44,000
	4A	33,000
	4B	22,000
Assembly - Theaters	1A	Unrestricted
	1B	66,000
	2A	44,000
	2B	33,000
	2C	22,000
	3A	33,000
	3B	27,500
	3C	22,000
	4A	16,500
	4B	not permitted
Assembly - Night Clubs	1A	Unrestricted
	1B	33,000
	2A	22,000
	2B	16,500
	2C	11,000
	3A	16,500
	3B	13,750
	3C	11,000
	4A	8,250
	4B	5,500

Note to Table

1. May be unlimited in area.

ARTICLE M-5

FIRE PROTECTION CONSTRUCTION REQUIREMENTS

M-501.1 FIRE RESISTANCE RATING

Fire Tests, Building Construction and Materials, ASTM E 119-1969.

M-501.2 LISTED MATERIALS AND DEVICES

Fire Resistance Ratings, A(I)A-1964
Approved Equipment and Materials for Industrial Safety, FM-1970
Building Materials List, UL-1970

M-501.4 LIGHT TRANSMITTING PLASTIC CONSTRUCTION

A.1	Flammability of Self-Supporting Plastics,	ASTM D 635-1968
A.2.a	Measuring the Density of Smoke from the Burning or Decomposition of Plastics	ASTM D 2843-1970
A.2.b	Surface Burning Characteristics of Building Materials	ASTM E 84-1968
B.	Flammability of Self-Supporting Plastics,	ASTM D 635-1968

M-503.1 FLAME SPREAD

Surface Burning Characteristics of Building Materials ASTM E 84-1968.

M-504.6.A DECORATIVE MATERIAL

Fire Tests for Flame Resistant Textiles and Films, NFPA No. 701-1969, except that decorative materials for interior use shall not be subjected to tests concerning accelerated weathering.

M-507.2 INSTALLATION

Fire Doors and Windows, NFPA No. 80-1970

M-514.1 ACCEPTABLE ASSEMBLIES

Fire Doors and Windows, NFPA No. 80-1970
Fire Tests, Door Assemblies, NFPA No. 252-1958

M-514.2.E CLOSING DEVICES

Self-closing and automatic closing devices for fire doors shall comply with Section 11 of the Standard for Fire Doors and Windows, NFPA No. 80-1970 and for exits shall comply with Section 5-2 of the Life Safety Code, NFPA No. 101-1970.

M-517.4 AUTOMATIC VENTS

Smoke and Heat Venting Guide, NFPA No. 204-1968.

M-518.6 WATER TANKS

Water Tanks, NFPA No. 22-1970

M-518.7 COOLING TOWERS

Water Cooling Towers, NFPA No. 214-1968

M-519.8 CLASSIFICATION

Fire Tests of Roof Coverings, NFPA No. 256 - 1970
Roof Coverings, Manual on, NFPA No. 203M-1970
Approved Materials and Equipment for Industrial Safety, FM - 1970
Building Materials List, UL - 1970

M-520.2.A.1 APPROVED MATERIALS

Flammability of Self Supporting Plastics, ASTM D 635-1968

ARTICLE M-6

MEANS OF EGRESS

M-601.3 ACCEPTED ENGINEERING PRACTICE

Code for Safety to Life From Fire in Buildings and Structures, NFPA No. 101-1967

M-604.2 MIXED OCCUPANCIES

Where an occupancy involves a fraction of the area of a building classified in another use group, the occupancy load of that area shall be determined on the basis of Table M-604.2 using the net floor area of the space excluding walls, columns, furred in spaces, cabinets built into walls or acting as full height partitions, heating or ventilating or similar equipment fastened or fixed in place, and accessory spaces such as closets, machine and equipment rooms, toilets, exits, corridors, elevators and similar unoccupied spaces but not excluding aisles and halls.

TABLE M-604.2
OCCUPANCY LOAD TABLE

SPACE	NET FLOOR AREA PER OCCUPANT Sq. Ft.
Billiard Room	50
Class Rooms	20
Dance Floors	7
Dining Spaces (Public)	15
Exhibition Spaces	15
Garages and Open Parking Structures	250
Gymnasiums (Excluding Seating Areas)	15
Habitable Rooms	140
Industrial Shops	100
Instructional Areas	30
Kitchens (non-family)	200
Laboratories	50
Preparation Rooms	100
Libraries	25
Locker Rooms	12

TABLE M-604.2(continued)

SPACE	NET FLOOR AREA PER OCCUPANT Sq. Ft.
Offices	100
Sales Areas (Retail)	
1st Floor or Basement	25
All other floors	50
Seating Areas (Audience) in All Places of Assembly	
Fixed Seats	(1)
Movable Seats	7
Standing Room (2)	3
Storage Rooms	200

Notes to Table

1. Designed number of seats of occupants.
2. Standing room applies only to areas outside of seating and circulation areas which have been approved by the Bureau for use for standing room.

M-606.4 MEASUREMENT

Travel distance shall be measured along a natural unobstructed path of travel based on aisles or passageways which run parallel or perpendicular to the walls enclosing the space. Diagonal measurements shall not be used unless it can be demonstrated to the Bureau that the space will be unobstructed or that the diagonal is the path of travel. The path of travel along a corridor shall be measured along its center from the center of the door providing access to the corridor to the center of door providing egress from it. The path of travel over stairs shall be a straight line in the direction of the pitch of the stairs at the center of the outer edge of the treads.

M-608.3 MINIMUM WIDTH

The minimum nominal width of corridors may be reduced not more than 2 inches per unit of exit width to allow for minor projections such as door frames, corridor trim, radiators, drinking fountains, room or locker door swings, provided the total area of the projection does not exceed 5 percent of the wall on which they occur.

M-609.3 WIDTH

Projections not greater than permitted for corridors may be permitted in exit passageways.

M-610.3 DOOR OPENING WIDTHS AND CAPACITY

The exit capacity of doors and door openings shall be based on units of exit widths in relation to the nominal width of the door or opening in accordance with Table M-610.3. Door jambs, stops, the thickness of the door when open or other projections into the opening shall not reduce the required nominal width to more than 2 inches for each 22 inches of width.

TABLE M-610.3
DOOR OPENING WIDTHS (1)

TYPE OF OPENING	NOMINAL DOOR OPENING	MINIMUM CLEAR OPENING	NUMBER OF UNITS OF EXIT WIDTH	STAIR WIDTH SERVED BY DOOR OPENING IN OR OUT OF ENCLOSURE
	Inches	Inches		Inches
Single Openings	32	30	1	36
	36	33	1-1/2	44
	44-48	40	2	56
Multiple Openings Separated By Mullions	2-32's	-	2	56
	1-32 + 1-36	-	2-1/2	66
	2-36's	-	3	88
	2-44's	-	4	110
Openings For Double-Action Doors Or Doors Swinging In Pairs	48	44	2	56
	56	51	2-1/2	66
	66	60	3	88
	78	71	3-1/2	100
	88	80	4	110

Note to Table

1. Where greater capacity is desired, multiples of doors (any number) separated by mullions may be used in one opening.

M-610.6 REVOLVING DOORS

Revolving doors shall be automatic, collapsible, panic proof, and shall conform to the following:

(1) Each of the four wings shall be independently supported by hangers without braces and with a collision resistant safety release incorporated in the hanger, which when subjected to simultaneous outward adjustable pressures of between 60 and 80 pounds applied to outer stiles of two opposing wings will cause the wings to fold on themselves, like leaves of a book, in the direction of egress thereby providing two paths through the vestibule of the revolving door to the outside. Provisions may be made for sliding the collapsed doors to one side of the vestibule to provide only one opening.

(2) The construction of revolving doors and their vestibules shall be at least equal in fire resistant qualities as required for other doors and frames similarly located.

(3) At least one push bar shall be applied on each wing.

(4) Glazing material in the wings and in the sides of the vestibule shall be at least 7/32 inches thick.

(5) The speed of rotation of the revolving door shall be controlled so that it does not exceed 15 revolutions per minute and permits a speed of at least 10 revolutions per minute.

(6) The floor level inside or outside of a revolving door shall be level with that of the enclosure for a distance of at least 4 feet.

(7) The owner shall be responsible at all times for the operation and maintenance of revolving doors and shall have the doors checked and examined at intervals not to exceed 6 months. All parts of the doors, including the safety releases and speed control mechanism shall be maintained in good working order. Adequate records shall be maintained for Bureau review when required.

M-612.3 HEADROOM

Headroom in a flight of stairs shall be measured vertically between parallel inclined planes, one of which contains the line of the nosing or upper front edge of each tread and extends to its intersection with a landing and the other plane is through the lowest point directly above the lower plane, which limits the headroom of the stair.

M-614.3 CONSTRUCTION

Fire escapes may be attached to the structure or erected independently of it and connected by bridges.

(1) Fire escapes shall provide a continuous unobstructed path of travel to the ground, to a safe area of refuge or to another exit providing access to the street. The direction of travel shall be clearly indicated, connected and lead downward. Where connecting walkways are necessary over adjoining roofs they shall be provided with handrails.

(2) Egress to fire escape platforms shall be by way of doors or casement windows not less than 24 inches wide and 6 feet 6 inches high with the sills of the openings located not more than 12 inches above the fire escape platform or interior floor level. Except in the top floor, doors to return type fire escapes shall provide at least 3/4 hour fire resistance rating and casement windows shall be metal framed and glazed with 1/4 inch wired glass.

(3) Openings within 10 feet horizontally or below fire escapes shall be equipped with opening protectives providing not less than 3/4 hour fire resistance rating or they shall be metal frames glazed with 1/4 inch wired glass.

(4) The minimum width of stairs and platforms shall be 22 inches between railings or guards.

(5) All platforms and stairs shall be protected on each side of the path of travel by rails, guards or walls. Rails and guards shall be at least 42 inches above the platform and the front edge of step treads. Vertical supports of rails shall not be spaced wider than 4 feet on centers, and vertical members of the railing used as enclosing members shall not be spaced over 8 inches apart on centers. Horizontal or inclined enclosing members of the railing shall not be spaced further apart than 12 inches on centers. All rails and guards shall be of non-combustible materials designed to withstand a horizontal force of not less than 25 pounds per linear foot and a vertical force of not less than 100 pounds per linear at right angles to the top of the railing.

(6) Platforms or treads of steps shall be provided with openings or perforations of at least 25 percent of the area to provide drainage of water, snow and ice. The minimum dimension of such openings shall not exceed one inch. Railings and step risers shall be raised at least 1 inch above level of platforms or treads or other means of drainage shall be provided. Platforms and treads shall be designed to withstand a live load of 100 pounds per square foot and a concentrated load of 300 pounds.

(7) All platforms shall be adequately attached to the structure and stair platforms. Connections shall be designed so that they will not be endangered or deteriorate because of weather exposure.

(8) Steps shall have a maximum rise of 9 inches and a minimum tread of 8 inches and the slope shall not exceed 45 degrees.

(9) The maximum height of flights of stairs between platforms shall be 12 feet except that in special open industrial buildings this height may be increased to 20 feet when approved by the Bureau.

(10) The minimum headroom over platforms and stairs shall be 6 feet 8 inches.

(11) Where a roof provides an area of refuge with an interior means of egress from it, egress to the roof shall be provided from the platform serving the top story by means of a gooseneck ladder. The gooseneck shall extend at least 36 inches above the exterior parapet wall and thence to the roof surface. The ladder shall be at least 18 inches wide and be located so that it is at least 18 inches inside the platform railing. Ladder rungs shall be spaced not less than 10 inches nor more than 12 inches on centers with a clearance of at least 6 inches from the building.

(12) Swing stair sections of counter-weighted design, may be used over driveways or when the fire escapes project beyond the street lot line to provide egress from the second story to grade provided that when lowered they do not obstruct the path of travel from any other exit and they comply in all respects with the requirements for Class B fire escapes. Counterweights shall balance about a pivot without the use of cables so that a weight of 150 pounds one step from the pivot will not start the swinging section downward and that a weight of 150 pounds 1/4 of the length of the swinging stairs from the pivot will positively cause the section to swing down.

ARTICLE M-7

SPECIAL USE AND OCCUPANCY

M-703.3 STATIC ELECTRICITY

Static Electricity, NFPA No. 77-1966

M-703.6 OTHER SOURCES

Lightning Protection, NFPA No. 78-1964.
Indoor General Storage, NFPA No. 231-1970.
Outdoor General Storage, NFPA No. 231A-1970.
Cellular Rubber and Plastics Materials, NFPA No. 231B-1968.

M-708.2 RELIEF DEVICES

(A) Classification of Materials. The explosion characteristics of gases, vapors, or dusts shall be classified as provided in M-708.2.(A)(1), M-708.2(A)(2), and M-708.2.(A)(3).

(1) Class I Material (Fast). Class I material shall mean gases, vapors or dusts which, when ignited under optimum conditions of particle size and concentrations, produce a maximum pressure of over 65 psig or an average rate of pressure rise of over 700 psig per second. Examples among others include:

Dusts	Vapors	Gases
Aluminum(1)	Acetone	Acetylene(1)
Magnesium	Alcohols	Ethylene(1)
Magnesium-aluminum alloy	Ethers	Hydrogen(1)
Sorbic acid(1)	Gasoline	Propane
Titanium(1)	Carbon disulfide(1)	
Zirconium(1)	Methyl ethyl ketone	
Some metal hydrides	Heptane	

Note to List

1. These materials have very rapid reaction rates.

(2) Class II Material (Medium). Class II material shall mean gases, vapors, or dusts which, when ignited under optimum conditions of particle size and concentrations, produce a maximum pressure of less than 65 psig and an average rate of pressure rise of less than 700 psig per second. Examples among other include:

Metal Dusts	Misc. Dusts	Plastics	Grains, Spices
Iron (carbonyl)	Bituminous coal	Cellulose acetate	Alfalfa
Manganese	Cork	Phenol formaldeyde	Rice
Tin	Dextrin	Polyethylene	Grain dust & flour
Zinc	Lignit	Polystyrene	Mixed grains
	Peat	Urea resins	Spices
	Silicon	Phtalic anhydride & resin	Starch
	Sulfur		
	Woodflour		

(3) Class III Material (Slow). Class III material shall mean vapors and dusts which, when ignited under optimum conditions of particle size and concentrations, produce a maximum pressure of less than 10 psig and an average rate of pressure rise of less than 100 psig per second.

Metal Dusts	Misc. Dusts
Antimony	Anthracite
Cadmium	Carbon black
Iron (impure)	Coffee
Lead	Tea
Copper	
Tungsten	

(B) Explosion Relief Ratios. The aggregate clear vent relief area ratio in square feet per cubic feet shall comply with Table M-708.2(B) for the materials classified in M-808.2(A) for the construction types listed in Notes to Table:

TABLE M-708.2(B)
EXPLOSION RELIEF RATIOS FOR
BUILDINGS OR PORTIONS OF BUILDINGS

VOLUME - Cu. ft.	Less than 1,000			1,000 to 12,000		
% AREA COMPRISING HAZARDOUS OPERATIONS	Any			Less than 25%		
MATERIAL	I	II	III	I	II	III
Construction Type A(1)	1:50	1:60	1:70	1:80	1:100	1:120
Construction Type B(2)	1:40	1:50	1:60	1:60	1:80	1:100
Construction Type C(3)	1:30	1:35	1:45	1:40	1:50	1:60
Construction Type D(4)	1:20	1:25	1:30	1:30	1:40	1:50
VOLUME - Cu. ft.	1,000 to 12,000			1,000 to 12,000		
% AREA COMPRISING HAZARDOUS OPERATIONS	25% to 50%			Over 50%		
MATERIAL	I	II	III	I	II	III
Construction Type A(1)	1:70	1:85	1:90	1:60	1:70	1:80
Construction Type B(2)	1:50	1:60	1:80	1:45	1:55	1:65
Construction Type C(3)	1:35	1:45	1:55	1:30	1:35	1:40
Construction Type D(4)	1:25	1:35	1:40	1:20	1:25	1:30
VOLUME - Cu. ft.	12,000 to 36,000			12,000 to 36,000		
% AREA COMPRISING HAZARDOUS OPERATIONS	Less than 10%			10% to 25%		
MATERIAL	I	II	III	I	II	III
Construction Type A(1)	1:120	1:140	1:160	1:00	1:120	1:140
Construction Type B(2)	1:115	1:125	1:140	1:95	1:105	1:120
Construction Type C(3)	1:90	1:110	1:130	1:70	1:90	1:110
Construction Type D(4)	1:80	1:100	1:120	1:60	1:80	1:100

TABLE M-708.2(B) - (Continued)

VOLUME - Cu. ft.	12,000 to 36,000			12,000 to 36,000		
% AREA COMPRISING HAZARDOUS OPERATIONS	25% to 50%			Over 50%		
MATERIAL	I	II	III	I	II	III
Construction Type A(1)	1:90	1:110	1:130	1:80	1:100	1:120
Construction Type B(2)	1:80	1:95	1:110	1:70	1:85	1:100
Construction Type C(3)	1:60	1:80	1:100	1:50	1:70	1:30
Construction Type D(4)	1:50	1:70	1:90	1:40	1:50	1:60

VOLUME - Cu. ft.	Over 36,000			Over 36,000		
% AREA COMPRISING HAZARDOUS OPERATIONS	Less than 10%			10% to 25%		
MATERIAL	I	II	III	I	II	III
Construction Type A(1)	1:130	1:150	1:180	1:110	1:130	1:160
Construction Type B(2)	1:120	1:135	1:160	1:100	1:100	1:140
Construction Type C(3)	1:90	1:100	1:130	1:80	1:90	1:120
Construction Type D(4)	1:80	1:90	1:120	1:70	1:80	1:100

VOLUME - Cu. ft.	Over 36,000			Over 36,000		
% AREA COMPRISING HAZARDOUS OPERATIONS	25% to 50%			Over 50%		
MATERIAL	I	II	III	I	II	III
Construction Type A(1)	1:100	1:120	1:150	1:80	1:90	1:110
Construction Type B(2)	1:90	1:105	1:130	1:70	1:80	1:90
Construction Type C(3)	1:70	1:80	1:100	1:50	1:60	1:70
Construction Type D(4)	1:60	1:70	1:90	1:30	1:40	1:50

Notes to Table

1. Construction Type A means reinforced concrete
2. Construction Type B means independent steel frame
3. Construction Type C means ordinary block, brick or wood
4. Construction Type D means panel, metal or plastic skin

(C) Relief Devices. Venting systems shall terminate at a safe location outside of buildings. Vent ducts shall lead to the outside by the most direct route without sharp directional changes and shall be of such construction to resist explosion pressures without bursting.

M-710.1 FLOOR OPENINGS

Floor and Wall Openings, Railings and Toe Boards, ANSI A12.1-1967

M-710.2 WALL OPENINGS

Floor and Wall Openings, Railings and Toe Boards, ANSI A12.1-1967

M-713.0 Gases

Safety Data Sheets, MCA
Liquefied Natural Gas at Utility Gas Plants, NFPA No. 59A - 1967

M-714.0 CHEMICALS

Fire and Explosion Hazards of Organic Peroxides. A(I)A Research Report No. 11-1967.
Safety Data Sheets, MCA.
Ammonium Nitrate Storage, NFPA No. 490-1967.
Ammonium Nitrate and Blasting Agents, Separation Distances for, NFPA No. 492-1968.
Sulfur Fires, Explosions, Prevention, NFPA No. 655-1968.

M-715.0 DUST HAZARDS

Pulverized Fuel Systems, NFPA No. 60-1961.
Starch Factories, Dust Hazards, NFPA No. 61A-1962.
Terminal Grain Elevators, Dust Hazards, NFPA No. 61B-1970.
Flour and Feed Mills, Dust Hazards No. 61C-1962.
Sugar and Cocoa, Dust Hazards, NFPA No. 62-1967.
Industrial Plants, Dust Explosions, NFPA No. 63-1964.
Country Grain Elevators, Dust Hazards, NFPA No. 64-1959.
Coal Preparation Plants, Dust Hazards, NFPA No. 653-1959.
Plastics Industry, Dust Hazards, NFPA No. 654-1963.
Spice Grinding Plants, Dust Hazards, NFPA No. 656-1959.
Confectionary Manufacturing Plants, NFPA No. 657-1967.
Pneumatic Conveying Systems, NFPA No. 66-1970.
Woodworking Plants, Dust Hazards, NFPA No. 664-1962.

M-716.0 METALS AND METAL DUSTS

Magnesium Storage and Handling, NFPA No. 48-1967.
Titanium Storage and Handling, NFPA No. 481-1961.
Zirconium, Plants Producing, NFPA No. 482M-1961.
Aluminum Processing and Finishing, NFPA No. 65-1970.
Aluminum Powder, Manufacture of, NFPA No. 651-1967.
Magnesium Powder, Plants Handling, NFPA No. 652-1968.

M-717.0 FIBERS

Storage of Combustible Fibers, NFPA No. 44-1953.

M-718.3 ACCEPTED ENGINEERING PRACTICE

Terminal Grain Elevators, NFPA No. 61B-1970
Country Grain Elevators, NFPA No. 64-1959
Grain Elevators, Suction and Venting, NFPA No. 661-1942

M-720.3 GROUNDING

Lightning Protection, NFPA No. 78-1968

M-721.0 PIERS, WHARVES AND MARINAS

Piers and Wharves, NFPA No. 87-1968
Marinas and Boatyards, NFPA No. 303-1966

M-727.0 AIRCRAFT HANGERS

Aircraft Hangers, NFPA No. 409-1970

M-728.0 PLACES OF ASSEMBLY, THEATERS, AND MOTION PICTURE THEATERS

Sections 318, 319, and 320 of National Building Code, AIA-1967 except 318.5 shall not apply.

M-731.3.A FLAME RESISTANCE

Fire Tests for Flame Resistant Textiles and Films, NFPA No. 701-1969

M-731.6 ACCEPTED ENGINEERING PRACTICE

Tents, Grandstands, and Air Supported Structures used as Places of Assembly, NFPA No. 102-1967.

M-732.4 MATERIALS

Fire Tests for Flame Resistant Textiles and Films, NFPA No. 701-1969

ARTICLE M-8

STRUCTURAL REQUIREMENTS

M-802.2.A ACCEPTED ENGINEERING PRACTICE

(1) Steel

Architecturally Exposed Structural Steel	AISC - 1960
Design, Fabrication and Erection of Structural Steel for Buildings	AISC - 1969
Longspan Steel Joists, LJ-Series and LH-Series	AISC - 1967
Manual of Steel Construction	AISC - 1963
Open Web Steel Joists, J-Series and H-Series	AISC - 1965
Structural Joints Using ASTM A325 Bolts or A490 Bolts	AISC - 1966
Design of Cold-Formed Steel Structural Members	AISI - 1968
Light Gauge Cold-Formed Stainless Steel Structural Members	AISI - 1968
Tentative Criteria for Structural Applications of Steel Cable for Buildings	AISI - 1966
Recommended Practices for Resistance Welding	AWS C1.1 - 1966
Code for Welding in Building Construction	AWS D1.0 - 1969
Design Practices Manual	MBMA - 1967

(2) Concrete

Reinforced Concrete Structures	ACI 315 - 1963
Building Code Requirements for Reinforced Concrete	ACI 318 - 1963
Concrete Formwork	ACI 347 - 1968
Manufacture of Reinforced Concrete Floor and Roof Units	ACI 512 - 1967
Reinforced Gypsum Concrete	ANSI A59.1 - 1968
Ready-Mixed Concrete	ASTM C94 - 1969

(3) Masonry

Precast Concrete Floor Units	ACI 711 - 1958
Building Code Requirements for Masonry	ANSI A41.1 - 1953
Building Code Requirements for Reinforced Masonry	ANSI A41.2 - 1960
Exterior Thin Veneer Marble	ANSI A94.2 - 1961
Exterior Thin Veneer Marble in Curtain or Panel Wall	ANSI A94.3 - 1961
Hollow Non-Load-Bearing Concrete Masonry Units	ASTM C129 - 1964T
Building Requirements, Engineered Brick Masonry	SCPI - 1966

(4) Lumber

Timber Construction Manual	AITC - 1966
Timber Construction Standards	AITC 100 - 1969
Timber Structural Glued Laminated, Inspection Manual for	AITC 200 - 1963 with Supplement - 1967
Hurricane - Resistant Plywood Construction	APA - 1966
Plywood Beams, Design and Fabrication of	APA - 1966
Plywood Construction Systems	APA - 1967
Plywood Curven Panels, Design and Fabrication of	APA - 1964
Plywood Design Specifications	APA - 1966
Plywood Folded Plate Fabrication	APA - 1966
Plywood Stressed Skin Panels, Design and Fabrication of	APA - 1964
Pile Building Design	AWPI - 1969
Pile Foundation Know How	AWPI - 1968
Pressure Treated Timber Foundation Piles for Permanent Structures	AWPI - 1965
Pressure Treated Timber Piles for Permanent Structures	AWPI - 1967
Stress Grade Lumber and Its Fastenings, National Design Specifications for	(N)FPA - 1968 with Supplement - 1970
Structural Design Data - Wood	(N)FPA - 1970

(5) Aluminum

Specifications for Aluminum Structures	AA - 1967
Standards for Anodized Architectural Aluminum	AA - 1965

(6) Glass

Transparent Safety Glazing Material Used in Buildings	ANSI Z97.1 - 1966

(7) Interior Finishes

Gypsum Plastering	ANSI A42.1 - 1964
Interior Lathing and Furring	ANSI A42.4 - 1967
Marble Interior	ANSI A94.1 - 1961
Application and Finishing of Wallboard	ANSI A97.1 - 1965
Tile, Glazed Ceramic Wall, Installed Portland Cement Mortar	ANSI A108.1 - 1967
Tile, Ceramic Mosaic Installed Portland Cement Mortar	ANSI A108.2 - 1967
Tile, Quarry, and Pavers Installed in Portland Cement Mortar	ANSI A108.3 - 1967
Tile, Ceramic Installed in Dry Set Portland Cement Mortar	ANSI A108.5 - 1967
Vermiculite Plastering and Vermiculite Acoustical Plastic for Sound Conditioning	V1 - 1963

M-802.2.C SPECIFIC REQUIREMENTS

(1) Structural Steel

a. Suspended Cantilever Design. Except for snow loads, live loads shall be considered as applied either to the entire area or to a portion of an area and the arrangement of loads resulting in the highest stresses in the supporting member shall be used in the design.

b. Compression Flange Bracing. When roof decking is attached by self tapping screws, rivets, tack welding or other media that provide questionable permanent lateral support for the compression flange of supporting members, provision shall be made for additional bracing members unless substantiated by test methods cited in this code. Credit may be taken for the equivalent of one row of bracing in attachments for which supporting data has been submitted substantiating such partial credit.

c. Effective Length of Compression Members. For designs utilizing diaphrams to prevent sidesway, provision shall be made to substantiate both the diaphram and the attachments to shear walls or other bracing media. When bracing is designed to resist sidesway, a minimum of 3% of the vertical loads shall be considered as applied as the horizontal loading.

d. Continuous Roof Deck. Where the adequacy of the roof deck to support the design load is based on moment factors due to continuity, provision shall be made in the design of purlins or parts for a 15% increase. If the roof deck can be substantiated with simple beam moment factor, the increased load on interior supports may be ignored regardless of the continuity used in the construction.

e. Prefabricated Buildings.

(1) Approximate Method. The use of approximate methods involving variable sections for rigid frames shall include a 20% increase in the horizontal reaction as one criteria of design. Exact methods shall include sufficient increment points where variable sections are utilized.

(2) Characteristics of Variable Sections. Computations involving depths, or radius of gyration for variable sections shall use characteristics at third points to determine critical values.

(3) Web Thickness Ratios. In rigid frames the limitation of widths of webs to 8000 V FY times the thickness may be ignored on the rafter section.

602.3.A ORDINARY MATERIALS

(1) Structural Steel. When materials are not identified as to manufacture and grade, or do not conform to the requirements of SEC. 1.4 of the AISC Specifications, or are not substantiated with certified mill test reports, the allowable working stresses specified in the standard for the design, fabrication and erection of structural steel shall be reduced ten percent. For proprietary steels substantiated with certified mill test data, the above reduction shall be based on the allowable stresses for the nearest applicable ASTM standard cited in SEC. 1.4 of the AISC Specifications, providing the test data results equal or exceed those required by such ASTM standard.

(2) Cast Steel and Steel Forgings. The allowable stresses shall be the same as those specified for structural steel.

(3) Cast Iron. The allowable stresses for cast iron shall be in accordance with Table M - 602.3.A (3).

TABLE M - 602.3.A (3)
ALLOWABLE STRESSES FOR CAST IRON

TYPE	LBS. PER SQUARE INCH
Tension	3,000
Extreme Tension (fiber stress in bending)	3,000
Extreme Compression (fiber stress in bending)	16,000
Shear	3,000
Column Compression	$9{,}000 \text{ minus } 40\frac{l}{r}$ (1)

Note to Table

1. Where l = length
   r = radius of gryation

   Ratio $\frac{l}{r}$ - does not exceed 70

(4) Open Web Steel Joists. The allowable working stresses specified for open-web steel joists shall be in accordance with the standard specifications for steel joist construction.

In no case shall the allowable loads for open-web steel joists exceed the standard load tables of the standard specifications. For all other open-web steel joists unless specifically approved and identified by load tests prescribed in SEC. 608.0 of the code, the allowable working stresses and loading specified by the standard shall be reduced ten percent.

(5) Formed Steel Construction. The allowable working stresses for light gage cold-formed steel structural members not substantiated by certified tests prescribed by the AISI specifications shall be reduced ten per cent.

(6) Concrete. The allowable working stresses for ordinary materials shall be based on the following proportions by dry volumetric measurement and maximum water content per sack of cement in accordance with the standard building code requirements for reinforced concrete specified in Table M - 802.3.A(6), subject to the ten percent reduction prescribed herein for ordinary materials.

TABLE M - 802.3.A(6)
ALLOWABLE STRESSES FOR CONCRETE

28-DAY STRENGTH OF CONCRETE IN POUNDS PER SQUARE INCH	CONCRETE PROPORTIONS	GALS. OF WATER PER SACK OF CEMENT
2,000	1:5 1/2	7 1/2
2,500	1:4 1/2	6 3/4
3,000	1:3 1/2	6

(7) Concrete Reinforcement. The allowable working stresses for reinforcement specified in the code for reinforced concrete herein listed shall be used in all reinforced construction, including reinforced concrete, reinforced gypsum concrete and all forms of reinforced masonry subject to the ten percent reduction specified for ordinary, unidentified materials except as specified in Table M-802.3.A(7).

TABLE M - 802.3.A(7)
ALLOWABLE STRESSES FOR CONCRETE REINFORCEMENT

TYPE OF STEEL ELEMENT	MAXIMUM STRESS Lbs. per sq. inch
High Yield Strength Steel (50 percent of Yield Point)	30,000
Steel Pipe, concrete-filled (45 percent of Yield Point)	16,000

(8) Reinforced Gypsum Concrete. When ordinary materials are used, the allowable working stresses shall be based on the following proportions, measured dry by weight with sufficient water to make a plastic mix that will fill the form: 100 percent neat calcined gypsum: 97 percent gypsum and 3 percent wood chips; shavings, or fibers; and 87.5 percent gypsum and 12.5 percent wood chips, shavings or fibers, with ultimate compressive strengths of 1800, 1000, and 500 pounds per square inch respectively.

The working stresses shall not exceed the values prescribed in the standard for reinforced gypsum concrete subject to the ten percent reduction prescribed for ordinary materials.

(9) Lumber. When the grade of lumber is not submitted under the Controlled Material Procedure the maximum allowable working stress shall not exceed 1200 pounds per square inch. Short duration load factors shall not be considered in determining the allowable working stress in buildings of industrial use.

(10) Masonry

(a) Mortar. Mortar shall be classified in accordance with Table M-802.3.A (10)(a).

TABLE M - 802.3.A (10) (a)

MORTAR CLASSIFICATIONS

MORTAR TYPE	AVE. COMP. STRENGTH OF 2 INCH CUBES AT 28 DAYS (psi)	PROPORTIONS BY VOLUME: PORTLAND CEMENT	MASONRY CEMENT (TYPE 11)	HYDRATED LIME OR LIME PUTTY	AGGREGATE, MEASURED IN A DAMP & LOOSE CONDITION
M (formerly A-1)	2500 or above	1	1	-	$2\frac{1}{4}$ to 3
		1	-	$\frac{1}{4}$	times the sur
S (formerly A-2)	1800 - 2500	$\frac{1}{2}$	1	-	of the volume
		1	-	$\frac{1}{4}$ to $\frac{1}{2}$	of cement an
N (formerly B)	750 - 1800	-	1	-	lime used.
		1	-	$\frac{1}{2}$ to $1\frac{1}{4}$	
O (formerly C)	350 - 750	-	1	-	
		1	-	$1\frac{1}{4}$ to $2\frac{1}{2}$	

(b) Type of Mortar Required. Masonry shall be laid in the mortars in accordance with Table M-802.3.A(10)(b).

TABLE M-802.3.A(10)(b)
MORTAR TYPES FOR SPECIFIC USES

USE	MORTAR TYPES
Masonry in contact with earth	M or S (N may be used when not exposed to frost action.)
Masonry not in contact with earth	
Piers of solid masonry	M,S or N
Piers of hollow units	M or S
Walls of solid masonry	M, S, N or O
Walls of hollow units	M, S or N
Cavity walls and masonry bonded hollow walls where assumed design wind pressure	
(a) exceeds 20 psf	M or S
(b) does not exceed 20 psf	M, S or N
Glass block	S or N
Non-bearing partitions or fireproofing	M, S, N, O or gypsum
Gypsum partition tile or block	Gypsum
Fire brick	Refractory air setting mortar
Linings of existing masonry, either above or below grade	M or S

(c) Masonry Compressive Stresses. The allowable compressive stresses for masonry shall be in accordance with Table M-802.3.A(10)(c).

TABLE M - 802.3.A (10) (c)

MASONRY COMPRESSIVE STRESSES

TYPE OF MASONRY	ALLOWABLE MAXIMUM COMPRESSIVE STRESSES, GROSS CROSS-SECTIONAL AREA			
	M MORTAR	S MORTAR	N MORTAR	O MORTAR
	psi	psi	psi	psi
Solid Masonry of brick and other solid units of clar or shale; sand-lime or concrete brick				
over 8000 psi	400	350	300	200
4500 - 8000 psi	250	225	200	150
2500 - 4500 psi	175	160	140	110
1500 - 2500 psi	125	115	100	75
Grouted solid masonry of brick and other solid units of clay or shale; sand-lime or concrete brick				
over 4500 psi	350	275	200	-
2500 - 4500 psi	275	215	155	-
1500 - 2500 psi	225	175	125	-
Solid masonry of solid concrete masonry units				
over 1800 psi	175	160	140	100
1200 - 1800 psi	125	115	100	75
Masonry of hollow units	85	75	70	-
Piers of hollow units, cellular spaces filled with mortar or grout	105	95	90	-
Hollow walls (cavity or masonry bonded) solid units (1)				
over 1800 psi	140	130	110	-
1200 - 1800 psi	100	90	80	-
Hollow units	70	60	55	-
Stone ochlar masonry				
Granite	800	720	640	500
Limestone or marble	500	450	400	325
Sandstone or cost stone	400	360	320	250
Rubblestone, coursed, rough or random	140	120	100	80

NOTE TO TABLE

(1) On gross cross-sectional of wall minus area of cavity between wythes. When hollow walls are loaded concentrically, the allowable stresses may be increased by 25 per cent.

M-802.5 MATERIAL STANDARDS

(1) Steel

Mild to Medium-Strength Carbon-Steel	ASTM A 27 - 1965
Structural Steel	ASTM A 36 - 1969
Castings, Gray Iron	ASTM A 48 - 1964
Cold-Drawn Steel Wire for Concrete Reinforcement	ASTM A 82 - 1966
Cold-Rolled Carbon Steel Strip	ASTM A 109 - 1965
Electric-Fusion (Arc)-Welded Steel Pipe	ASTM A 139 - 1968
High-Strength Steel Castings for Structural Purposes	ASTM A 148 - 1965
Corrosion-Resisting Chromium-Nickel Steel Plate, Sheet & Strip	ASTM A 167 - 1963
Corrosion-Resisting Chromium-Nickel Steel Plate, Sheet & Strip	ASTM A 176 - 1963
Welded Steel Wire Fabric for Concrete Reinforcement	ASTM A 185 - 1969
Carbon Steel Castings Suitable for Fusion Welding for High Temperature Service	ASTM A 216 - 1969
Mild Steel Covered Arc-Welding Electrodes	ASTM A 233 - 1969
Carbon Steel Forgings for General Industrial Use	ASTM A 235 - 1967
Alloy Steel Forgings for General Industrial Use	ASTM A 237 - 1967
High-Strength Low-Alloy Structural Steel	ASTM A 242 - 1968
Flat-Rolled Carbon Steel Sheets of Structural Quality	ASTM A 245 - 1964
Welded and Seamless Steel Pipe Piles	ASTM A 252 - 1969
Low and Intermediate Tensile Strength Carbon Steel Plates of Structural Quality	ASTM A 283 - 1967
Hot-Rolled Carbon Steel Strip of Structural Quality	ASTM A 303 - 1964
Low-Carbon Steel, Externally and Internally Threaded, Standard Fasteners	ASTM A 307 - 1968
Lone Terne Iron or Steel Sheets, Coils and Cut Lengths	ASTM A 308 - 1967
Low-Alloy Steel Arc-Welding Covered Electrodes	ASTM A 316 - 1969
High-Strength Bolts for Structural Steel Joints, Including Suitable Nuts and Plain Hardened Washers	ASTM A 325 - 1968
Steel Sheet Piling	ASTM A 328 - 1969
Zinc-Coated (Galvanized) Iron or Steel Roofing Sheets	ASTM A 361 - 1967
High-Strength Low-Alloy Hot-Rolled Steel Sheets and Strip	ASTM A 375 - 1964
Uncoated Seven-Wire Stress Relieved Strand for Prestressed Concrete	ASTM A 416 - 1968
Uncoated Stress - Relieved Wire for Prestressed Concrete	ASTM A 421 - 1965

Reinforcement, High Strength Deformed Billet-Steel Bars for Concrete, with 75,000 Psi Minimum Yield Strength	ASTM A 431 - 1966
High-Strength Structural Steel	ASTM A 440 - 1966
High-Strength Low-Alloy Structural Manag-nese Vanadium Steel	ASTM A 441 - 1968
Quenched and Tempered Steel Bolts and Studs	ASTM A 449 - 1968
Quenched and Tempered Alloy Steel Bolts for Structural Steel Joints	ASTM A 490 - 1968
Deformed Steel Wire for Concrete Reinforce-ment	ASTM A 496 - 1964
Welded Deformed Steel Wire Fabric for Concrete Reinforcement	ASTM A 497 - 1969
Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes	ASTM A 500 - 1968
Hot-Formed Welded and Seamless Carbon Steel Structural Tubing	ASTM A 501 - 1968a
Steel Structural Rivets	ASTM A 502 - 1965
Regular Quality Hot-Rolled and Cold-Rolled Alloy Steel Sheets and Strip	ASTM A 506 - 1964
High-Yield Strength, Quenched and Tempered Alloy Steel Plates, Suitable for Welding	ASTM A 514 - 1969a
Structural Steel with 42,000 psi Minimum Yield Point	ASTM A 529 - 1964
Bare Mild Steel with 42,000 psi Minimum Yield Point	ASTM A 558 - 1968
Mild Steel Electrodes for Gas Metal-Arc Welding	ASTM A 559 - 1965T
Carbon Steel Nuts	ASTM A 563 - 1966
Carbon and High-Strength Low-Alloy Steel, Hot-Rolled Strip, Hot-Rolled Sheets, and Cold-Rolled Sheets	ASTM A 568 - 1966T
Hot-Rolled Carbon Steel Sheets and Strip, Structural Quality	ASTM A 570 - 1966T
High-Strength Low-Alloy Columbium-Vanadium Steels of Structural Quality	ASTM A 572 - 1968
High-Strength Low-Alloy Structural Steel with 50,000 psi Minimum Yield Point to 4 inc. Thick	ASTM A 588 - 1969
Deformed Billet-Steel Bars for Concrete Reinforcement	ASTM A 615 - 1968
Rail-Steel Deformed Bars for Concrete Reinforcement	ASTM A 616 - 1968

(2) Concrete

Roofs and Slab-On-Grade, Vermiculite Concrete	ANSI A122.1 - 1965
Natural Cement	ASTM C 10 - 1964
Concrete Aggregates	ASTM C 33 - 1967
Compressive Strength of Molded Concrete Cylinders	ASTM C 39 - 1966
Organic Impurities in Sand for Concrete	ASTM C 40 - 1966
Ready-Mixed Concrete	ASTM C 94 - 1969
Portland Cement	ASTM C 150 - 1968

Waterproof Paper for Curing Concrete	ASTM C 171 - 1963
Air Entrained Portland Cement	ASTM C 175 - 1968
Lightweight Aggregates for Structural Concrete	ASTM C 330 - 1964T
Lightweight Aggregates for Insulating Concrete	ASTM C 332 - 1966

(3) Masonry

Dry-Set Portland Cement Mortar	ANSI A 118.1 - 1967
Structural Clay Load-Bearing Wall Tile	ASTM C 34 - 1962
Gypsum Partition Tile and Block	ASTM C 52 - 1954
Concrete Building Brick	ASTM C 55 - 1966T
Structural Clay Non-Load-Bearing Tile	ASTM C 56 - 1962
Building Brick (Solid Masonry Units Made from Clay or Shale)	ASTM C 62 - 1966
Sampling and Testing Brick	ASTM C 67 - 1966
Calcium Silicate Face Brick	ASTM C 73 - 1967
Effect of Organic Impurities in Fine Aggregate on Strength of Mortar	ASTM C 87 - 1963T
Hollow Load-Bearing Concrete Masonry Units	ASTM C 90 - 1966T
Masonry Cement	ASTM C 91 - 1968
Absorption and Bulk Specific Gravity of Natural Building Stone	ASTM C 97 - 1947
Modulus of Rupture of Natural Building Stone	ASTM C 99 - 1952
Sampling and Testing Structural Clay Tile	ASTM C 112 - 1960
Ceramic Glazed Structural Clay Facing Tile, Facing Brick, and Solid Masonry Units	ASTM C 126 - 1969
Hollow Non-Load Bearing Concrete Masonry Units	ASTM C 129 - 1964T
Aggregate for Masonry Mortar	ASTM C 144 - 1966T
Solid Load Bearing Concrete Masonry Units	ASTM C 145 - 1966T
Compressive Strength of Natural Building Stone	ASTM C 170 - 1950
Hydrated Lime for Masonry Purposes	ASTM C 207 - 1969
Structural Clay Facing Tile	ASTM C 212 - 1960
Facing Brick (Solid Masonry Units Made from Clay or Shale)	ASTM C 216 - 1966
Mortar for Unit Masonry	ASTM C 270 - 1964T
Lightweight Aggregates for Concrete Masonry Units	ASTM C 331 - 1969
Aggregates for Masonry Grout	ASTM C 404 - 1961
Mortar and Grout for Reinforced Masonry	ASTM C 476 - 1963
Structural Clay Non-Load Bearing Screen File	ASTM C 530 - 1963T

(4) Lumber

Round Timber Piles	ASTM D 25 - 1958
Establishing Structural Grades of Lumber	ASTM D 245 - 1969
Preservation Treatment of Timber Products	AWPA C 1 - 1968
Preservation Treatment of Lumber, Timber Bridge Ties, and Mine Ties	AWPA C 2 - 1968
Preservation Treatment of Piles by Pressure Process	AWPA C 3 - 1968
Preservation Treatment of Piles by Pressure Process	AWPA C 4 - 1968
Timber Foundation Piles	AWPA C 12 - 1968
Structural Lumber Fire Retardant Pressure Treatment	AWPA C 20B- 1963
Plywood Fire Retardant Pressure Treatment	AWPA C 27B- 1963
Structural Glued Laminated Members Before Gluing Southern Pine, Pacific Coast Douglas Fir and Western Hemlock	AWPA C 28 - 1967
Plywood	AWPA C 29 - 1967
Pressure Treated Lumber and Plywood with Volatile Petroleum Solvent	AWPI LP-4 - 1968
Pressure Treated Lumber and Plywood with Water Borne Preservatives	AWPI LP-22 - 1968
Pressure Treated Lumber and Plywood with Light Petroleum Solvent - Penta Solution	AWPI LP-33 - 1968
Pressure Treated Lumber and Plywood with Volatile Petroleum Solvent - Penta Solution	AWPI LP-44 - 1968
Pressure Treated Lumber and Plywood with Heavy Petroleum Solvent - Penta Solution	AWPI LP-77 - 1968
Glues for Laminated and Built Up Wood Members	FS CG - 496 with Amendment No. 2
Design and Fabrication of Hardwood Glued Laminated Lumber	SHP - 1959
Structural Glued Laminated Southern Pine Timber	SCPI - 1965
American Lumber Standards for Softwood Lumber	USDC R 16 - 1953
Particle Board	USDC CS 236 - 1966
Hardboard	USDC CS 251 - 1963
Structural Glued Laminated Lumber	USDC CS 253 - 1963
Calculating Strength of Plywood	USFS Bul.1630 - 1950
Glued Laminated Douglas Fir	WWPA - 1966
Structural Glued Laminated Douglas Fir Timber	WWPA - 1964

(5) Aluminum

Aluminum Windows	AAMA 302.6 - 1968
Aluminum Sliding Glass Doors	AAMA 402.6 - 1968
Aluminum-Alloy Sand Castings	ASTM B 26 - 1968
Aluminum-Alloy Die Castings	ASTM B 85 - 1969
Aluminum-Alloy, Permanent Mold Castings	ASTM B 108 - 1968
Aluminum-Alloy Sheet and Plate	ASTM B 209 - 1969
Aluminum-Alloy Drawn Seamless Tubes	ASTM B 210 - 1968
Aluminum-Alloy Bars, Rods and Wire	ASTM B 211 - 1969
Aluminum-Alloy Extruded Bars, Rods, Shapes, and Tubes	ASTM B 221 - 1969
Aluminum-Alloy Seamless Pipe and Seamless Extruded Tube	ASTM B 241 - 1969
Aluminum-Alloy Die and Hand Forgings	ASTM B 247 - 1969
Aluminum and Aluminum-Alloy Welding Rods and Bare Electrodes	ASTM B 285 - 1961T
Aluminum-Alloy Standard Structural Shapes, Rolled or Extruded	ASTM B 308 - 1968
Aluminum-Alloy Round Welded Tubes	ASTM B 313 - 1968
Aluminum-Alloy Rivet and Cold Heading Wire and Rods	ASTM B 316 - 1968
Aluminum-Alloy Extruded Structural Pipe and Tube	ASTM B 429 - 1967

(6) Interior Finishes

Gypsum Plastering	ANSI A 42.1 - 1964
Portland Cement Stucco	ANSI A 42.2 - 1946
Portland Cement Plastering	ANSI A 42.3 - 1946
Interior Lathing and Furring	ANSI A 42.4 - 1967
Interior Marble	ANSI A 94.1 - 1961
Application and Finishing of Wallboard	ANSI A 97.1 - 1965
Gypsum	ASTM C 22 - 1950
Gypsum Plasters	ASTM C 28 - 1968
Gypsum Wallboard	ASTM C 36 - 1966
Gypsum Lath	ASTM C 37 - 1967
Gypsum Partition Tile or Block	ASTM C 52 - 1954
Gypsum Sheathing Board	ASTM C 79 - 1967
Hydraulic Hydrated Lime for Structural Purposes	ASTM C 141 - 1967
Structural Insulating Board Made from Vegetable Fibers, Specification for	ASTM C 208 - 1960

(7) Roofing and Siding

Gypsum Sheathing Board	ASTM C 79 - 1967
Structural Insulating Board Made from Vegetable Fibers, Specification for	ASTM C 208 - 1960
Structural Insulating Board Made from Vegetable Fibers, Testing	ASTM C 209 - 1960
Weather Resistance of Natural Slate	ASTM C 217 - 1958
Asbestos-Cement Roofing Shingles	ASTM C 222 - 1966
Asbestos-Cement Siding	ASTM C 223 - 1966
Structural Insulating Formboard	ASTM C 532 - 1966
Felted and Woven Fabrics Saturated with Bituminous Substances for Use in Waterproofing and Roofing	ASTM D 146 - 1965
Asphalt Roll Roofing Surfaced with Powdered Talc or Mica	ASTM D 224 - 1968
Asphalt Shingles Surfaced with Mineral Granules	ASTM D 225 - 1965
Asphalt-Saturated Roofing Felt for Use in Waterproofing and in Constructing Built-Up Roofs	ASTM D 226 - 1968
Coal-Tar Saturated Roofing Felt for Use in Waterproofing and in Constructing Built-Up Roofs	ASTM D 227 - 1956
Asphalt Roll Roofing, Cap Sheets, and Shingles	ASTM D 228 - 1969
Asphalt Roll Roofing Surfaced with Mineral Granules	ASTM D 249 - 1968
Asphalt-Saturated Asbestos Felts for Use in Waterproofing and Constructing Built-Up Roofs	ASTM D 250 - 1968
Asphalt for Use in Constructing Built-Up Roof Coverings	ASTM D 312 - 1964
Asphalt for Dampproofing and Waterproofing	ASTM D 449 - 1949
Accelerated Weathering Test for Bituminous Materials	ASTM D 529 - 1962
Asphalt-Saturated and Coated Asbestos Felts for Use in Constructing Built-Up Roofs	ASTM D 655 - 1947
Asphalt Siding Surfaced with Mineral Granules	ASTM D 699 - 1958
Fiberboard Nail-Base Sheathing	ASTM D 2277 - 1966
Wood Shingles, Red Cedar, Red Cypress, Hardwood	USDC CS 31 - 1952

(8) Plumbing and Piping

Welded and Seamless Steel Pipe	ASTM A 53 - 1969
Welded Wrought Iron Pipe	ASTM A 72 - 1968
Cast Iron Soil Pipe and Fittings	ASTM A 74 - 1966
Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless Steel Pipe for Ordinary Uses	ASTM A 120 - 1968a

Gray Iron Castings for Valves, Flanges and Pipe Fittings	ASTM A 135 - 1969
Electric-Fusion (Arc)-Welded Steel Pipe (Sizes 4 inches and Over)	ASTM A 139 - 1968
Spiral-Welded Steel or Iron Pipe	ASTM A 211 - 1968
Copper Brazed Steel Tubing, Specifications for	ASTM A 254 - 1964
Cast Iron and Ductile Iron Pressure Pipe	ASTM A 377 - 1966
Brass Plate, Sheet, Strip, and Rolled Bar	ASTM B 36 - 1969
Seamless Copper Pipe, Standard Sizes	ASTM B 42 - 1966
Seamless Red Brass Pipe	ASTM B 43 - 1966
Seamless Copper Tube	ASTM B 75 - 1968
Seamless Copper Water Tube	ASTM B 88 - 1966a
Seamless Brass Tube	ASTM B 135 - 1967
Copper Drainage Tube (DWV)	ASTM B 306 - 1966a
Clay Drain Tile	ASTM C 4 - 1962
Standard Strength Clay Sewer Pipe	ASTM C 13 - 1969
Concrete Sewer, Storm Drain, and Culvert Pipe	ASTM C 14 - 1968
Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe	ASTM C 76 - 1968
Extra Strength Clay Pipe	ASTM C 200 - 1969
Standard and Extra Strength Perforated Clay Pipe	ASTM C 211 - 1968
Asbestos-Cement Pressure Pipe	ASTM C 296 - 1969
Compression Joints for Vitrified Clay and Spigot Pipe	ASTM C 425 - 1966T
Asbestos-Cement Nonpressure Sewer Pipe	ASTM C 428 - 1969
Bituminized Drain and Sewer Fiber Pipe	USDC CS 116- 1954
Sewer and Storm Drain (SRP)	USDC CS 228- 1961
Plastic Pipe and Fittings (PE)	USDC CS 255- 1963
Plastic Pipe and Fittings (PVC)	USDC CS 256- 1963
Plastic Drain, Waste and Vent Pipe and Fittings (ABS)	USDC CS 270- 1965
Plastic Drain, Waste and Vent Pipe and Fittings (PVC)	USDC CS 272- 1965

(9) Plastics

Water Absorption of Plastics	ASTM D 570 - 1963
Deformation of Plastics Under Load	ASTM D 621 - 1964
Tensile Properties of Plastics	ASTM D 638 - 1968
Compressive Properties of Rigid Plastics	ASTM D 695 - 1968T
Coefficient of Linear Thermal Expansion of Plastics	ASTM D 696 - 1944
Shear Strength of Plastics	ASTM D 732 - 1946
Resistance of Plastics to Accelerated Service Conditions	ASTM D 756 - 1956
Exposure of Plastics to S-1 Mercury Arc Lamp	ASTM D 795 - 1965T
Plastic Drain, Waste and Vent Pipe and Fittings Acrylonitri-Butadiene-Styrene (ABS)	USDC CS 270 - 1965
Plastic Drain, Waste and Vent Pipe and Fittings Polyvinyl (PVC)	USDC CS 272 - 1965

M-803.8.A LIVE LOADS 100 POUNDS OR LESS

For live loads of 100 pounds or less, the design live load on any member supporting 150 square feet or more may be reduced at the ratio of 0.08 percent per square foot of area supported by the member. The reduction shall be determined by the following formula with the maximum limited to 60 percent:

$$R = 100 \times \frac{D + L}{4.33\ L}$$ in which

R = reduction in percent.
D = dead load per square foot of area supported by the member.
L = design live load per square foot of area supported by the member.

M-811.4 BEARING SOIL

Moisture-Density Relations of Soils, Using 5.5 lbs. Rammer and 12 inch Drop	ASTM D 698-1966T
Moisture-Density Relations of Soils, Using 10 lb. Rammer and 18 inch Drop	ASTM D 1557-1966T

M-812.0 FOUNDATION STANDARDS

Building Code Requirements for Excavations and Foundations	ANSI A 56.1-1952

M-814.0 PILE FOUNDATIONS

Pile Foundations	AISI-1963
Welded and Seamless Steel Pipe Piles	ASTM A 252-1969

ARTICLE M-9

LIGHT, VENTILATION, HEAT, AIR CONDITIONING, AND REFRIGERATION

M-903.1 ARTIFICAL LIGHT

Industrial Lighting, ANSI A11.1 - 1965
Protective Lighting, ANSI A85.1 - 1956
Office Lighting, ANSI A-132.1 - 1966

M-905.1 WHEN REQUIRED

Guide and Data Books - Applications, ASHRAE - 1963
Fundamentals and Equipment, ASHRAE - 1963

M-909.2 PLATFORMS

Safety Code for Window Cleaning, ANSI A39.1 - 1969

M-910.3 HEAT LOSS CALCULATIONS

Guide and Data Books, Fundamentals & Equipment, Sec. III Load Calculations, ASHRAE - 1963

M-911.1 MECHANICAL REFRIGERATION

Safety Code for Mechanical Refrigeration, ANSI B9.1-1964

M-1312.2.A ORGANIZATION

Private Fire Brigades, NFPA No. 27 - 1967

M-1313.2.B INSTALLATION

Portable Pumping Units, NFPA No. 191 - 1959
Centrifugal Fire Pumps, NFPA No. 20 - 1970

M-1315.1 APPROVED EQUIPMENT

Fire Protection Equipment List, UL - 1970
Approved Equipment and Materials for Industrial Fire Safety, FM-1970

M-1315.2.B EXCEPTIONS TO FIRE PROTECTION REQUIREMENTS

Identification of the Fire Hazard of Materials, NFPA No. 704M - 1966
Fire Hazard Properties of Flammable Liquid, Gases and Volatile Solids, NFPA No. 325M - 1965
Hazardous Chemical Data, NFPA No. 49 - 1968

M-1315.3.B MAINTENANCE

The accepted engineering practices cited under M-1301.3.A, M-1302.2.A, M-1304.2, M-1305.2, M-1306.2, M-1307.2, M-1308.2, M-1309.2, M-1310.3.A, M-1312.2.A, and M-1313.2.B.
Care and Maintenance of Sprinkler Systems, NFPA No. 13A - 1968
Care of Fire Hose, NFPA No. 198 - 1958
Maintenance and Use of Portable Fire Extinguishers, NFPA No. 10A - 1968

M-1315.4.B INSPECTION AND TESTS

The accepted engineering practices cited under M-1315.3.B.

ARTICLE M-14

ELEVATORS, ESCALATORS, DUMBWAITERS, LIFTS, AND CONVEYOR EQUIPMENT

M-1401.1, M-1402.1, M-1403.1, M-1404.1, and M-1406.1 CONSTRUCTION AND OPERATION

Safety Code for Elevators, Dumbwaiters and Moving Walks, ANSI A17.1 - 1965 and Supplements ANSI A17.1a - 1967, ANSI A17.1b - 1968 and ANSI A17.1c - 1969.

ARTICLE M-15

SIGNS AND OUTDOOR DISPLAY STRUCTURES

M-1503.0 STRUCTURAL, FIRE PROTECTIVE AND OTHER REQUIREMENTS

Signs and Outdoor Display Structures ANSI A60.1-1949

N. J. A. C. 12:115

WORKER HEALTH AND SAFETY ACT
NEW JERSEY

BUILDING CODE

Effective May 1, 1971

STATE OF NEW JERSEY
DEPARTMENT OF LABOR & INDUSTRY
BUREAU OF ENGINEERING & SAFETY
TRENTON, NEW JERSEY

New Jersey Administrative Code

Title 12, Chapters 110 to 210

The Administrative Procedures Act of 1968 established the New Jersey Administrative Code (N.J.A.C.) effective September 1, 1969. Safety regulations previously identified by a regulation number must now be cited by N.J.A.C. citation. The citation consists of N.J.A.C., title number, and chapter number; for example N.J.A.C. 12:120. The following list shows the chapter numbers of the Administrative Code, the short titles, and effective dates of all regulations of the Bureau of Engineering and Safety as of April 1971.

Part 1

Worker Health and Safety Act

Chapter 110. Plan Filing—7/1/69. Amendment—9/1/70.
Chapter 111. Registration—9/1/70.
Chapter 115. Building Code—5/1/71.
Chapter 116. Maintenance, Construction and Demolition—9/1/70.
Chapter 120. Sanitation—12/1/69.
Chapter 121. Heat Producing Appliances and Air Conditioning Systems—1/1/70.
Chapter 122. Local Exhaust Systems—6/28/51.
Chapter 130. Labeling of Hazardous Chemicals—12/1/67.
Chapter 131. Threshold Limit Values—12/1/67.
Chapter 132. Wet Nitrocellulose—12/1/69.
Chapter 133. Flammable and Combustible Liquids—5/1/71.
Chapter 140. Conveyors and Cableways—12/1/67.
Chapter 141. Woodworking Machinery—12/1/67.
Chapter 142. Extractors and Centrifuges—12/1/69.
Chapter 143. Mechanical Presses—12/1/69.
Chapter 144. Abrasive Wheels—12/1/69.
Chapter 145. Mechanical Power Transmission Guarding—9/1/70.
Chapter 147. Industrial Trucks—5/1/70.
Chapter 148. Overhead and Gantry Cranes—5/1/70.
Chapter 160. Welding and Cutting—7/1/69.
Chapter 161. Smoking—5/1/70.
Chapter 162. Electrical Installations—5/1/70.
Chapter 170. Work in Confined Spaces—12/1/67.
Chapter 173. Occupational Noise Exposure—5/1/71.

(*Continued on inside back cover*)

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N. J. A. C. 12:115

BUILDING CODE

Effective May 1, 1971

STATE OF NEW JERSEY
DEPARTMENT OF LABOR & INDUSTRY
BUREAU OF ENGINEERING & SAFETY
TRENTON, NEW JERSEY

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ARTICLE 8. STRUCTURAL REQUIREMENTS.

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FOREWORD

This Chapter, to be known as Chapter 115, Building Code of Title 12, N.J.A.C., supersedes the Standard Building Code of New Jersey as the Building Code applicable to all buildings and structures subject to the Worker Health and Safety Act, P.L. 1965, Chapter 154, N.J.S.A. 34:6A.

The Act imposes upon employers the duty to furnish a safe and healthy place of employment; upon owners of premises used as places of employment the responsibility to maintain safe premises; upon other persons, the duty not to interfere with protective devices and safeguards, nor to obstruct, hinder or delay the Commissioner in the enforcement of the Act; and upon the Commissioner the duty to enforce the Act by making inspections, issuing orders and prohibiting employment in places which constitute an imminent physical hazard. These provisions are contained in the Act as follows:

"3. Every employer shall furnish a place of employment which shall be reasonably safe and healthful for employees. Every employer shall install, maintain and use such employee protective devices and safeguards including methods of sanitation and hygiene and where a substantial risk of physical injury is inherent in the nature of a specific work operation shall also with respect to such work operation establish and enforce such work methods, as are reasonably necessary to protect the life, health and safety of employees, with due regard for the nature of the work required.

"4. The owner of any premises used in whole or in part as a place of employment shall be responsible for its structural adequacy, protection against the origin and spread of fire and for the provision of adequate general ventilation and lighting, emergency egresses, fire warning systems and for safe elevator systems.

"5. No person shall render ineffective any employee protective devices or safeguards installed or provided in compliance with the provisions of this act for the protection of the health or safety of any employee.

"6. The commissioner shall enforce the provisions of this act, make complaints against persons violating its provisions and prosecute violations of the same.

"The commissioner shall have the power and authority to enter and inspect any place of employment, and to make such investigation as is reasonably necessary to carry out the provisions of this act. All information obtained shall be kept confidential except as is necessary to establish

a violation of this act in an action that may be brought for the enforcement of this act. The record or determination of any proceeding under this act or any statement or report of any kind whatsoever obtained or received in connection with the administration or enforcement of the provisions of this act shall be privileged and not admissible as evidence in any action for any purpose whatsoever, except such actions that may be brought for the enforcement of this act.

"No person shall obstruct, hinder or delay or interfere with the force or otherwise the performance by the commissioner of any duty under the provisions of this act.

"7. If upon inspection the commissioner discovers a condition which exists in violation of the provisions of this act he shall be authorized to order in writing such violation to cease and to take such steps necessary to enforce such an order. Said written order shall state the items which are in violation of the provisions of this act and shall provide a reasonable specified time within which the violations must cease. The person responsible shall make the corrections necessary to comply with the requirements of this act within the time specified in the order.

"If the violation constitutes an imminent physical hazard and the commissioner's order is not obeyed he may forthwith prohibit the employment of any person in any place or in any activity which would expose him to the imminent physical hazard. Upon notice received from the responsible employer or owner that the imminent physical hazard has been eliminated, a reinspection shall be made within one working day. If upon reinspection the commissioner determines that the imminent physical hazard has been eliminated, work may be resumed immediately. If the reinspection is not made within one working day following said notice, work may be resumed. Where the person responsible denies that a violation constituting an imminent physical hazard exists, he shall have the right to apply to the commissioner for a hearing which must be afforded and a decision rendered within 48 hours of the request for a hearing. If the commissioner rules against the petitioning party, the petitioning party shall have the right to apply for injunctive relief against the order to cease work. Jurisdiction for such injunctive relief shall be in the Chancery Division of the Superior Court of New Jersey, but the only issue to be determined shall be the existence of a violation constituting an imminent physical hazard. Such relief may be sought by an order to show cause and may be granted *ex parte* pending a hearing *de novo* of the matter."

The Act provides that persons aggrieved may appeal for a hearing as follows:

"8. Any person aggrieved by a ruling, action or order of the commissioner under this act upon application made within 15 days after written notice thereof shall be entitled to a hearing before the commisisoner who shall within 30 days thereafter hold a hearing of which at least 15 days' written notice shall be given to all interested parties. Within 30 days after such hearing the commissioner shall issue an appropriate order modifying, approving or disapproving his prior ruling, action or order. A copy of such order shall be served upon all interested parties. Pending the determination by the commissioner and upon application therefor, the commissioner may stay the operation of such ruling, action or order upon such terms and conditions as are reasonably necessary to insure compliance with the provisions of this statute."

This Chapter is promulgated by the Commissioner of Labor and Industry of the State of New Jersey, under authority vested in him by Section 9 of the Worker Health and Safety Act, as follows:

"9. The commissioner shall make and promulgate rules and regulations reasonably necessary to implement the purposes of this act. Such rules and regulations shall have the force and effect of law and shall be enforced in the manner provided in this act.

"Buildings or other structures in use on the effective date of this act as a place of employment other than a place where the manufacturing of goods of any kind is carried on shall not be made to comply with the requirements of rules and regulations promulgated hereunder substantially affecting such building or other structures unless such compliance is essential to correct an unsafe or unhealthful condition which constitutes a serious and substantial threat to the health or safety of employees."

The Act further grants the Commissioner the power to require that plans be filed for his approval as follows:

"10. The commissioner shall have the power and authority to require by rules and regulations promulgated hereunder that the owner of any building or structure to be erected or adapted as a place of employment submit to the commissioner such plans and specifications for his approval and other data relative thereto before the building or structure is erected or adapted.

"He shall further have the power and authority to require by rules and regulations promulgated hereunder that prior to the installation of sanitation facilities, fire prevention and protection, egresses, exhaust and ventilating systems, elevators and other conveying equipment and employee protective devices and equipment the owner or employer submit plans and specifications for his approval and other data relative thereto."

The Act places responsibility for administration and enforcement in the Bureau of Engineering and Safety.

"14. There is hereby established within the Division of Labor of the Department a Bureau of Engineering and Safety, the function of which shall be, under the direction of the commissioner, to administer and enforce the provisions of this act and to perform such other duties as the commissioner may direct or as may be provided by law. The bureau shall be administered by a deputy director of the Division of Labor, appointed by the commissioner, who shall be a licensed professional engineer of this State, but this requirement shall not apply to, or affect the continuance in such position of, the deputy director administering the bureau on the effective date of this act."

The Act contains the following penalty provision:

"19. Any person violating any of the provisions of this act shall be liable to a penalty of not less than $25.00 nor more than $500.00 to be collected in a civil action by a summary proceeding under the Penalty Enforcement Law (N.J.S. 2A:58–1). Any violation of the act by an officer, agent or employee shall also be a violation of the act by his employer if such employer had knowledge of and actual control over the cause of such violation. Where the violation is of a continuing nature each day during which it continues, after the date given by which the violation must be eliminated in the order by the commissioner, shall constitute an additional, separate and distinct offense, except during the time an appeal from said order may be taken or is pending.

"The commissioner is hereby authorized and empowered to compromise and settle any claim for a penalty under this section in such amount in the discretion of the commissioner as may appear appropriate and equitable under all of the circumstances."

The statute also provides authority for the Commisisoner to grant exception from the literal requirements of rules and regulations as follows:

"23. The commissioner shall have the power and authority to grant exceptions from the literal requirements of rules and regulations promulgated under this act. Such exception shall be granted in any particular case only where it is clearly evident that it is necessary to prevent undue hardship or where existing conditions prevent compliance. In no case shall any exception be granted unless in the opinion of the commissioner reasonable protection of the health and safety of workers and the public will be maintained hereby. An application for an exception shall be filed in writing with the commissioner, setting forth specifically the requirements of the rules and regulations from which an exception is desired and

the reason why enforcement of the applicable provisions of the rules and regulations is unreasonable. The commissioner shall grant or deny the exception within 30 days from the date of receipt by him of the application. The commissioner shall maintain a record of all exceptions granted and shall make such record reasonably available for public examination and shall mail a copy of all rulings granting exceptions to the members of the board."

Under Title 34, Chapter 7 of the Revised statutes, originally enacted in 1935, construction of containers (pressure vessels) is regulated by the New Jersey Board of Boiler, Refrigeration and Pressure Vessels rules. This Board operates as part of the Mechanical Inspection Bureau in the Division of Labor Standards, Department of Labor and Industry. Nothing contained in this regulation is intended to be in conflict with or less restrictive than the current rules promulgated by the Board and approved by the Commissioner. Copies of current pressure vessel rules and regulations may be obtained upon request from the Mechanical Inspection Bureau.

Prior to promulgation, this Regulation was submitted to the New Jersey State Industrial Safety Committee, Public Hearing and the New Jersey Industrial Safety Board, in accordance with the requirements of the Worker Health and Safety Act.

All publications, other than the Chapters of Title 12, N.J.A.C. referenced in this Chapter, are available for inspection or purchase in accordance with the Manual. Chapters 110 to 210 of Title 12, N.J.A.C. are available in accordance with the back cover of this publication.

ARTICLE 1

ADMINISTRATION

Sec. 100.0 Title and Citation.

This regulation shall be known and may be cited as Chapter 115, Building Code of Title 12, N.J.A.C. and is referred to hereinafter as "this code."

Sec. 101.0 Purpose.

The purpose of this code is to establish reasonable standards for the design, location, construction, erection, alteration, repair, maintenance, occupancy, use, removal and demolition of buildings and structures and their service equipment which are or will be used as places of employment, to protect the life, health and safety of employees.

Sec. 102.0 Scope.

This code shall apply to all buildings and structures and their appurtenant features which are in whole or in part places of employment subject to the Worker Health and Safety Act, P.L. 1965, Chapter 154, N.J.S.A. 34:6A, except as provided in 115.2.

Sec. 103.0 Effective Date.

The effective date of this code shall be May 1, 1971.

Sec. 104.0 Repeal of Prior Chapter.

Chapter 115, The Standard Building Code of New Jersey of Title 12, N.J.A.C. effective December 1, 1954 is hereby repealed.

Sec. 105.0 Manual.

105.1 Authoritative Standards. The Manual of this code contains standards which are acceptable methods of compliance with specific sections of the code.

105.2 Accepted Engineering Practice. Compliance with the accepted engineering practice cited in the Manual shall be deemed to meet the requirements of specific sections of this code when test methods or performance criteria are not prescribed in this code or other Chapters of Title 12, N.J.A.C.

Sec. 106.0 Coordination of Agencies.

Nothing herein shall be construed to affect the inherent responsibility of building, health, fire, police, and other administrative agencies of the municipalities, counties or state to cooperate with the Bureau in the enforcement of this code.

Sec. 107.0 Conflicting Legal Requirements.

107.1 Other Agency Requirements. Compliance with this code shall not be construed to satisfy the requirements of other state or federal agencies having jurisdiction nor shall compliance with the code be construed to nullify or supersede the approval required for local jurisdictions.

107.2 Bureau Requirements. If in any specific case there is an apparent difference in the materials, methods of construction or other requirements specified in different sections of this code, or between requirements of this code and of any other Chapters of Title 12, N.J.A.C., the more restrictive requirement shall govern.

Sec. 108.0 Validity.

If any section, clause or phrase of this code is held unconstitutional or invalid, such decision shall not affect the remaining portions of this code.

Sec. 109.0 Code Remedial.

109.1 Assurance of Safety. This code shall be construed and interpreted so that the health, safety and general welfare of the employees and the general public shall be assured.

109.2 Requirements not Provided for. Any requirement essential for structural, fire or sanitary safety of an existing or proposed place of employment or essential for the safety of the occupants thereof and which is not specifically covered by this code shall be determined by the Bureau.

Sec. 110.0 New Materials and Alternate Methods.

110.1 Approval Required. All new materials, systems or methods of construction not provided for in this code and any material or system of questioned ability or suitability, proposed for use in the construction and service equipment of a building or other structure shall be submitted to the Bureau for approval under the procedures established by this code.

110.2 Basis of Acceptability. Acceptability of a material, system, method, device or equipment for the use proposed shall be determined on the basis of its ability to perform the specified or necessary functions within the performance criteria or other limitations listed in this code or other Chapters of Title 12, N.J.A.C.

110.3 Determination of Suitability. Suitability of a material, system or method shall be established through tests or analysis according to this code.

Sec. 111.0 Controlled Materials Procedure.

111.1 Controlled Materials. Designs of buildings and structures or parts thereof prepared by architects or professional engineers of New Jersey, which specify materials classified other than ordinary in this code, shall be allowed when the selection of the materials and their applications in the designs is under the supervision of the professional of record. Such materials shall be classified as "Controlled Materials" and work incorporating their use shall be identified as "Controlled Construction."

111.2 Statement of Supervision. Designs under the Controlled Materials Procedure may be acceptable to the Bureau when the professional of record files a statement under signature and seal, in triplicate, indicating that he has supervised the preparation of the drawings, that he will check all working drawings, and that the work will be erected or installed to assure compliance with the approved plans, requirements of this code and other Chapters of Title 12, N.J.A.C.

111.3 Waiver of Plan Examinations and Field Inspections. The Bureau may waive certain phases of the examination of the plans and of the field inspections of the construction work, in whole or in part, for any buildings or structures submitted under the Controlled Materials Procedure.

111.4 Verified Report. Before the building or structure, or part thereof, under the Controlled Materials Procedure will be accepted by the Bureau for use or occupancy, the professional of record shall file a verified report that the construction or installation is in compliance with 111.2.

Sec. 112.0 Owner's Responsibility.

The owner of any premises used in whole or part as a place of employment shall be responsible for the provisions necessary to fulfill the purpose of this code.

Sec. 113.0 Compliance.

113.1 With Code. No building or structure, or any of its appurtenant features shall be used, constructed, extended, altered, repaired, removed or

demolished in violation of this code or other applicable Chapters of Title 12, N.J.A.C.; except that buildings or structures in use as places of employment on July 19, 1965 other than places where the manufacture of goods of any kind is carried on shall not be made to comply with the code when such compliance would substantially affect such buildings or structures; unless compliance is essential to correct a serious and substantial threat to the health and safety of employees.

113.2 Alterations and Repairs. Existing buildings and structures shall be made to conform to this code when alterations or repairs are made under the following conditions:

A. Alterations Exceeding Fifty Percent. If alterations or repairs to existing buildings and structures are made within any period of 12 months costing in excess of fifty percent of the physical value of the building, full compliance with this code shall be required.

B. Damages Exceeding Fifty Percent. If the existing building or structure is damaged by fire or any other cause to an extent of fifty percent of the physical value of the building, or structure before the damage was incurred, full compliance with this code shall be required.

C. Alterations Between Twenty-Five and Fifty Percent. If the cost of alterations or repairs to the existing building or structure is between twenty-five and fifty percent of the physical value of the building or structure, the Bureau shall determine to what degree the portions so altered or repaired shall be made to comply with the code.

D. Alterations Under Twenty-Five Percent. If the cost of alterations or repairs to the existing building or structure is twenty-five percent or less of the physical value of the building or structure, the Bureau shall permit restoration of the building or structure to its condition previous to the damage or deterioration with the same kind of material as those originally used, provided that such construction does not endanger the general health and safety.

E. Existing Roofs. Not more than twenty-five percent of the roof covering of any building shall be replaced in a period of one year unless the entire roof covering is made to conform to Sec. 719.0.

F. Physical Value. In applying 113.2, the net physical value of the building shall be determined by the Bureau based on current replacement costs.

113.3 Increase in Size. If the building is increased in floor area by more than thirty percent, or in number of stories, the entire building shall be made to conform to this code for new buildings except for existing buildings exempted by 113.1 and separated as specified in 310.4.

113.4 CHANGE IN USE.

A. No change in the use or occupancy of a building or structure which would subject it to any specific provision of this code shall be made without the approval of the Bureau and its certification that such structure meets the intent of the provisions governing new buildings for the proposed use and occupancy and that such change does not result in any greater hazard to public safety.

B. If a portion of the building is changed to a new use or occupancy group and that portion is separated from the remainder of the building with the required vertical and horizontal fire divisions as provided in Article 8, then the construction involved in the change shall be made to conform with the requirements for the new use and occupancy and the existing portion shall be made to comply with the exit requirements of this code.

113.5 CHANGES NECESSITATED BY LEGAL CONFORMANCE. The raising, lowering or moving of a building or structure necessitated by a change in legal grade or widening of a street, shall be permitted with the previous status of conformance to the code maintained, providing the building is not otherwise altered or its use and occupancy changed.

SEC. 114.0 MAINTENANCE.

All buildings and structures shall be maintained in a safe and sanitary condition. All service equipment, devices and safeguards which are required by this code or by other regulations of the Bureau or which were required by Bureau regulations or by statute in a building at the time it was erected, altered or repaired shall be maintained in good working order and in a safe and sanitary condition.

SEC. 115.0 PLAN FILING.

115.1 APPROVAL REQUIRED. No building or structure, or any of its appurtenant features shall be used, constructed, erected, altered, repaired or relocated before plans and specifications are submitted to the Engineering Section of the Bureau for approval. Plan filings shall be in accordance with Chapter 110, Plan Filing of Title 12, N.J.A.C. The applications, plans and specifications shall be reviewed and approved by Bureau professional engineers.

115.2 PROPER COMPLIANCE.

A. The Bureau Engineering Section shall approve the plans for all places of employment, except hotels and multiple dwellings in accordance with the requirements of this code.

B. The Bureau Engineering Section shall approve the plans for hotels and multiple dwellings in accordance with the requirement of Chapter 10, Regulations for the Construction and Maintenance of Hotels and Multiple Dwellings of Title 5, Subtitle B, N.J.A.C.

C. The approval of plans shall be a permit to proceed with the work in accordance with the plans. No variation to the approved plans shall be permitted without a written allowance from the Bureau.

115.3 CERTIFICATE OF PLAN APPROVAL. The Bureau shall issue a Certificate of Plan Approval for each application approved.

115.4 APPROVAL IN PART. The Bureau Engineering Section may issue an approval for the construction of foundations or any part of a building or structure before the entire plans and specifications for the project have been submitted, provided adequate information and detailed statements have been filed complying with all the pertinent requirements of this code and provided the applicant is aware that the approval in part will in no way prejudice further approval action of the Bureau.

115.5 APPROVED PLANS ON SITE. The owner of any project approved by the Bureau in plan procedure shall be responsible to have one set of approved plans available on the construction site for inspection service by the Bureau representatives during the construction work and until the project has been accepted for occupancy by the Bureau.

115.6 NOTICE OF START. When required by the Bureau, at least 24 hours notice of start of work shall be given by the party responsible for starting the work.

115.7 REVISIONS TO APPROVAL. Construction of approved designs shall not be changed or revised unless supplemental approval of such revisions are obtained from the Bureau Engineering Section.

115.8 SUSPENSION OF APPROVAL. An approval issued shall become invalid if the authorized work shall not have been commenced within one year after the date of plan approval, or is suspended or abandoned for a period of one year after commencing the work.

115.9 REVOCATION OF PLAN APPROVAL. The Bureau may revoke an approval issued under this code in case of any false statement or misrepresentation of fact in the application or in the plans on which the approval was based.

SEC. 116.0 CALLED INSPECTIONS.

116.1 NOTICE OF CONSTRUCTION STATUS. Adequate notice of construction status shall be given by the responsible party upon request when the Bureau deems it necessary to make any of the following inspections:

A. Special Construction. Buildings or structures involving the use of Controlled Material Procedures specified in Sec. 111.0 or new materials and alternate methods as covered in Sec. 110.0.

B. Foundations and Footings. Projects involving questionable soil conditions before footing or foundations are poured.

C. Concealed Structural Components. Projects involving concealed structural components after such members are secured in place but before any fire protection or finish materials have been installed.

D. Special Installations. All special construction and equipment as provided in this code for air conditioning, electric wiring, elevators, plumbing, refrigeration and mechanical and other installations involving unusual explosion, fire or other life hazards.

Sec. 117.0 Temporary Occupancy.

Upon request of an owner the Bureau may issue permission for temporary occupancy of a building, or structure, or part thereof before the entire work covered by the approval has been completed provided such portion or portions are in a state of construction which makes them safe for such occupancy.

Sec. 118.0 Temporary Structures.

118.1 Approval Required. The Bureau may issue an approval for temporary construction. Such approval shall be limited as to time of service, but in no case shall such temporary construction be permitted for more than one year. All temporary construction shall conform to structural strength, fire safety, egress facilities, light, ventilation and sanitary requirements of this code necessary to insure the public health and safety.

118.2 Termination of Approval. The Bureau shall terminate such special approval and shall order the demolition of any such construction when it shall have served its purpose or is required in the interest of the health and safety of workers or the public.

Sec. 119.0 Posting Buildings.

When required by the Bureau, buildings and structures shall be posted on all floors by the owner. The notice shall state the allowable live load, allowable occupancy load or the allowable fire load as directed.

Sec. 120.0 Enforcement.

If upon inspection, the Bureau discovers violations of this code, it shall serve upon the responsible person a written order to cease such violations. The

order shall state the items which are in violation and provide a reasonable specified time to eliminate the violations. In the case of serious or imminent physical hazard, the reasonable time to begin work necessary to correct the violations may be at once.

Sec. 121.0 Imminent Physical Hazard.

121.1 Definition. Buildings and structures or portions thereof which are or become structurally unstable or unsafe, severe fire hazard, deficient in egress facilities, unsanitary or otherwise dangerous to human life and public safety shall be considered an imminent physical hazard.

121.2 Notice of Unsafe Building or Structure. Where a building or structure or portions thereof has been declared an imminent physical hazard, the Bureau will serve upon the owner an order prohibiting employment of any persons within the area exposed to the imminent physical hazard and may also post notice on the building or structure.

121.3 Employment Prohibited. Buildings, structures or portions thereof which have been declared an imminent physical hazard shall be promptly vacated and shall not be used or occupied, except as necessary to perform work to restore them to safe condition.

121.4 Elimination of Imminent Physical Hazard. Buildings, structures or portions thereof declared to be imminent hazards shall not be reoccupied or used again until the imminent physical hazard has been eliminated and the Bureau has been given written notice and 24 hours (Saturdays, Sundays and holidays excluded) in which to reinspect and the Bureau has lifted the imminent hazard order.

121.5 Failure to Reinspect. Should the Bureau fail to reinspect within 24 hours (Saturdays, Sundays and holidays excluded) the building or structure may be occupied but may be ordered closed again if subsequent inspection reveals that the imminent physical hazard has not been properly and completely eliminated.

Sec. 122.0 Review Panel.

Any applicant who disagrees with a ruling of the Bureau professional engineer assigned to review his plans shall have a right to request further consideration by a review panel. When requested by an applicant for plan approval, the Deputy Director shall appoint a review panel consisting of not less than three licensed professional engineers of the Bureau. The authority of the panel shall be limited to determining if the plans and specifications, as presented, represent reasonable and substantial compliance with this code. The

applicant shall have a right to appear before the review panel and to present such evidence as he deems appropriate. The meeting shall be open to all parties of interest in the matter and their representatives. The decision of the review panel shall be made by majority vote. The Bureau will keep a written record of these decisions.

SEC. 123.0 RIGHT OF APPEAL.

Any person aggrieved by a ruling, action or order of the Bureau shall have a right to appeal to the Commissioner in accordance with Section 8 of the Worker Health and Safety Act.

SEC. 124.0 EXCEPTION.

The Commissioner may grant exceptions from the literal requirements of this code in accordance with Section 23 of the Worker Health and Safety Act.

ARTICLE 2

DEFINITIONS

ACCEPTED ENGINEERING PRACTICE	That which conforms to accepted principles, tests or standards of accredited authoritative agencies.
ACCESS STAIR	A stair between 2 floors occupied by the same tenant, which does not serve as a required exit.
ACCESSORY USE	A use incidental to the principal use of a building or structure.
ACCREDITED AUTHORITATIVE AGENCIES	National technical organizations, testing agencies, and industry associations engaged in the promulgation of specifications or test procedures to govern the manufacture, quality and use of building materials and their assemblies and requirements pertaining to equipment and its use.
ADDITION	A physical enlargement of an existing building or structure, service system or safety provision.
AIR CONDITIONING	The process by which the temperature, humidity, movement, cleanliness, and odor of air in buildings and structures used for human occupancy are controlled.
AIRCRAFT HANGAR	A building for the storage, care or repair of aircraft.
AIR-SUPPORTED STRUCTURE	A skin diaphragm made of pliable material, which achieves its shape, support and stability from internal air pressure.
ALLEY	A public thoroughfare less than 30 feet in width which has been legally dedicated or devoted to public use.
ALTERATION	A physical rearrangement of the whole or its parts of an existing building or structure, service system or safety provision.

AMUSEMENT DEVICE	A device or structure, open to the public, by which individuals are conveyed or moved in any direction for diversion.
APPROVED	Acceptable to the Commissioner. Devices having been tested and accepted for a specific purpose by a nationally recognized testing agency may be deemed to be acceptable.
ARCHITECT	A person licensed to practice architecture in New Jersey by the New Jersey State Board of Architects.
AREA	As applied to a building or structure, the maximum horizontal projected area of the building or structure including all enclosed extensions.
AREA OF REFUGE	A fire separated area to which egress is made through a horizontal exit which is of sufficient size for the combined occupancy load of it and the area it serves and which is provided with its own means of egress.
AREAWAY	An unroofed subsurface space adjacent to a building.
AUTOMATIC	As applied to a door or other opening, a door or other opening so constructed and arranged that it will open or close as required when the device is motivated by a predetermined temperature, rate of temperature rise or abnormal smoke condition.
AUTO LIFT	A mechanical device located on the grade floor only for raising motor vehicles above the floor of a building or structure for maintenance or repair purposes.
BASEMENT	A portion of the building partly underground, but having more than half its clear height above the average grade of the adjoining ground. A basement shall be considered a story. See CELLAR AND HEIGHT.

BAY (BUILDING)	The part of a building or structure included between two adjacent piers or mullions or between two adjacent lines of columns and extending through all stories of the building.
BUILDING	A structure enclosed within exterior walls or fire walls, built, erected and framed of component structural parts, designed for the housing, shelter, enclosure and support of individuals, animals or property of any kind. See STRUCTURE.
BUILDING LINE	The line, established by law, beyond which a building shall not extend, except as specifically provided by law.
BUILDING SERVICE EQUIPMENT	The mechanical, electrical and elevator equipment, including piping, wiring, fixtures and other accessories, which provide sanitation, lighting, heating, ventilation, fire-fighting and transportation facilities essential for the habitable occupancy of the building or structure for its designated use and occupancy.
BUILDING SITE	The area occupied by a building or structure, including the yards and courts required for light and ventilation, and such areas that are prescribed for access to the street.
BUREAU	Bureau of Engineering and Safety Division of Labor Standards Department of Labor and Industry State of New Jersey.
CELLAR	The portion of the building partly underground, having half or more than half of its clear height below the average grade of the adjoining ground. A cellar shall not be considered a story.
CODE	Chapter 115, Building Code of Title 12, N.J.A.C.
COLD-FORMED STEEL CONSTRUCTION	The type of construction in which the structural frame consists of studs, floor joists, arch ribs, rafters, steel decks, and other structural elements which are composed and fabricated of cold-formed sheet or strip steel.

COMBUSTIBLE	All material not classified as noncombustible.
COMMISSIONER	Commissioner of Labor and Industry or his authorized representative.
CONTROLLED CONSTRUCTION	The construction of a building or structure or a specific part thereof which has been designed and erected under the supervision of a professional engineer or architect, using controlled materials in compliance with the procedure defined in this code.
CONTROLLED EQUIPMENT AND MATERIALS	Materials of construction or equipment which are identified as to manufacture, tested or graded by an accredited authoritative agency and which meet standards of quality, strength, or performance in accordance with this code.
CONVEYOR	A horizontal, inclined, or vertical device for moving or transporting bulk materials, packages, or objects in a path predetermined by the design of the device, and having points of loading or discharge fixed or selective.
CORRIDOR	An enclosed passageway providing access from rooms or spaces to an exit.
COURT	An open, uncovered, unoccupied space partially or wholly surrounded by the walls of a structure.
COURT, ENCLOSED OR INNER	A court surrounded on all sides by the exterior walls of a structure or by such walls and an interior lot line.
COURT, OUTER	A court having at least one side thereof opening onto a street, alley, or yard or other permanent open space.
DEAD END	A portion of a corridor in which the travel to an exit is in one direction only.
DEAD LOAD	The weight of all permanent construction including walls, floors, roofs, partitions, stairs, and of fixed service equipment.

DECORATIVE MATERIAL	Material other than structural or finish material suspended from walls, ceilings or other parts of the structure such as draperies, hangings, light or sound diffusing media or other similar objects.
DELUGE SYSTEM	See SPRINKLER SYSTEM.
DEPARTMENT	The Department of Labor and Industry.
DRAFT CURTAIN	Noncombustible curtain boards suspended vertically from ceiling to retard movement of heat and smoke within an area under the roof.
DUCT	A tube, pipe, conduit or continuous enclosed passageway used for the conveying of air, gases or vapors.
DUMBWAITER	A hoisting and lowering mechanism equipped with a car, which moves in guides in a substantially vertical direction, the floor area of which does not exceed 9 square feet, whose total inside height whether or not provided with fixed or movable shelves does not exceed 4 feet, the capacity of which does not exceed 500 pounds, and which is used exclusively for carrying freight.
DUMBWAITER, INDUSTRIAL (OVERSIZED DUMBWAITER)	A hoisting and lowering mechanism equipped with a car which moves in guides in a substantially vertical direction, the floor area of which does not exceed 16 square feet whose total inside height whether or not provided with fixed or removable shelves does not exceed 4 feet the capacity of which does not exceed 1000 pounds and which is used exclusively for carrying materials.
EARTHQUAKE LOAD	The assumed lateral load acting in any horizontal direction on the structural frame due to the kinetic action of earthquakes.
ELECTRICAL EQUIPMENT	Installations of electrical conductors, fittings, devices and fixtures within or on buildings or structures.

ELEVATOR — A hoisting and lowering mechanism equipped with a car or platform which moves in guides for the transportation of individuals or freight in a substantially vertical direction through successive floors or levels of a building structure.

FREIGHT ELEVATOR — An elevator for the transportation of freight and only such individuals as are necessary for operation of elevator or handling of freight.

HAND ELEVATOR — A freight elevator that is driven by manual power.

HYDRAULIC ELEVATOR — A power elevator in which the motion of the car is obtained through the application of energy from liquid under pressure.

MATERIAL LIFT — See SHORT RISE MATERIAL LIFT.

PASSENGER ELEVATOR — An elevator for the transportation of individuals.

POWER ELEVATOR — An elevator in which the motion of the car is obtained through the application of energy other than by hand or gravity.

SIDEWALK ELEVATOR — A freight elevator with the hatch opening located partially or wholly outside of the building and with no opening into the building at its upper terminal landing.

EMPLOYEE — Any person engaged in service to an employer for wages, salary or other compensation.

EMPLOYER — Any person or corporation, partnership, individual proprietorship, joint venture, firm, company or legal entity who engages the services of an employee and who pays his wages, salary, or other compensation; and any person exercising supervision of employees on an employer's behalf.

ESCALATOR — A power driven, inclined, continuous stair used in raising or lowering passengers.

EXISTING BUILDING — A building erected prior to the adoption of this code.

EXIT — A means of egress from the interior of a building to the exterior, including any or all of the following: door openings, exit passageways, horizontal exits, interior or exterior stairs, fire escapes, escalators, ramps but not including access stairs, aisles, corridors or corridor doors.

EXIT COURT — An exterior unoccupied space which is open to the sky for the entire area, located on the same lot with a theater or other assembly building which it serves exclusively as an unobstructed exit to the street or other public space.

EXIT PASSAGEWAY — A horizontal means of egress from one vertical exit enclosure to another or from a vertical exit enclosure or a yard or court to an open exterior space or street.

FIRE ALARM SYSTEM — A system which detects a fire condition and activates a fire signal system.

AUTOMATIC FIRE ALARM SYSTEM — A system which automatically detects a fire condition and activates a fire alarm signal device.

CENTRAL STATION SYSTEM — A system in which all equipment is supervised by a central or proprietary station to which all alarm signals are transmitted and relayed to the municipal fire department.

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

FIRE CANOPY — A solid, horizontal projection, extending at least 2 feet beyond the exterior face of a building wall, located over a wall opening so as to retard the spread of fire through openings from one floor to another.

FIRE DOOR — A door and its assembly constructed and assembled in place as an opening protective.

FIRE DIVISION	The interior means of separation of one part of a floor area from another part together with fire resistive floor construction to form a complete fire barrier between adjoining or superimposed use groups or occupancies in the same building or structure.
FIRE DRILL	The organized procedure conducted with or without a private fire brigade for vacating the occupants of a building and for operating the first-aid fire appliances and equipment for the extinguishing of fire and safeguarding of life.
FIRE GRADING	The fire resistance ratings of fire walls, fire partitions and fire divisions separating mixed uses and occupancies in a building or structure.
FIRE HAZARD	The potential degree of fire severity existing in the use and occupancy of a building or structure and classified as extreme high, high, moderate, or low hazard.
FIRE LIMITS	See 404.1.
FIRE LOAD	The combustible content within a building during normal use and occupancy expressed in Btu per square foot. The nominal calorific value of 8,000 Btu per square foot shall be considered equivalent to one pound of combustible material per square foot.
FIRE PARTITION	See WALL.
FIRE RESISTIVE CONSTRUCTION	Construction in which walls, partitions, structural elements, floors, ceilings, and roofs or exits are constructed and protected with noncombustible materials of the fire resistance ratings specified in this code for Type 1 construction.
FIRE RESISTANCE RATING	The time in hours or fractions thereof that the materials or their assemblies will withstand fire exposure as determined by fire tests conducted in compliance with this code.

FIRE RESISTIVE PARTITION	A partition other than a fire partition which subdivides the floor area of a building for the purpose of restricting the spread of fire.
FIRE RETARDANT CONSTRUCTION	Fabricated units or assemblies of units of construction which have a fire resistance rating specified by this code for their specific use and application.
FIRE RETARDANT LUMBER	Lumber that has been treated by an approved pressure impregnation process and has a flame spread rating not higher than equivalent of 25 with no evidence of significant progressive combustion when tested for 30 minutes duration in accordance with accepted engineering practice.
FIRE SAFETY	The measure of protection of a building or structure against interior and exposure fire hazards through fire resistive construction and the provision of safe and fire detecting and extinguishing equipment.
FIRE STOP	A solid or compact, tight closure to retard the spread of flame or hot gases within concealed spaces.
FIRE WALL	See WALL.
FIRE WINDOW	An opening protective constructed so as to give protection against the passage of fire.
FLAME RESISTANCE	The property of materials or their assemblies which prevents or retards the surface spread of flames when subjected to fire under conditions of use.
FLAME SPREAD RATING	The measurement of flame spread on the surface of materials or their assemblies as determined by tests conducted in compliance with this code.
FLOOR FILLING	The type of short-span floor construction in fire resistive buildings installed between structural steel framing to serve as a combination structural floor slab or arch and fireproof protection of the framing.

FOUNDATION — A wall or other structural element below the floor nearest grade or other structural parts of a building which transmits the loads to the soil.

FOUNDATION WALL — See WALL.

FOYER — The enclosed space outside and adjacent to the auditorium of a theater or other place of assembly which is completely shut off from the auditorium and is used as an entrance, assembly or waiting space for the occupants.

FREIGHT ELEVATOR — See ELEVATOR.

GARAGE

MOTOR VEHICLE SERVICE STATION — A structure, building, or premise or any portion thereof where motor fuels are stored, and dispensed from fixed equipments into fuel tanks of motor vehicles and for other services incidental thereto.

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

OPEN PARKING STRUCTURE — A structure open to the outdoors 50 percent or more on two or more sides, used for parking motor vehicles.

PUBLIC GARAGE — A building for the storage, care or repair of more than four motor vehicles not included in the term SMALL GARAGE.

SMALL GARAGE — A garage for not more than four motor vehicles with no provision for repairing or servicing such vehicles for profit.

GRADE — The mean curb level or, when the curb level has not been established, or when all the walls of the building are more than 15 feet from street lines, "grade" means the mean elevation of the ground adjoining the building on the side under consideration.

GRANDSTAND — Structure, except movable seating and sectional benches, intended primarily to support individuals for purpose of assembly, but not applying to the permanent seating in theaters, churches, auditoriums, and similar buildings.

HALL — A passage providing access to rooms within a subdivision of a floor, such as a suite or apartment.

HEIGHT

HEIGHT OF BUILDING — The vertical distance from the average grade of the lowest side of the building to the average elevation of the roof of the highest story. When expressed in stories, the height shall be taken as the number of stories in the building including any story having more than half its clear height above the adjoining grade.

HEIGHT OF COURT — The vertical distance from the lowest level of the court to the mean height of the top of the enclosing walls.

HEIGHT OF STORY — The vertical distance from top to top of succesive 2 tiers of beams or finished floor surfaces; and, for the topmost story, from the top of the floor finish to the top of the ceiling joists, or, where there is no ceiling, to the top of the roof rafters.

HEIGHT OF WALL — The vertical distance from the foundation wall or other immediate support of such walls to the top of the wall.

HEATING APPLIANCE — Any device designed or constructed for the generation of heat from solid, liquid or gaseous fuel or electricity.

HIGH HEAT INDUSTRIAL APPLIANCE — An industrial appliance developing temperatures above 1500°F. in portions where substances or materials are heated such as billet and bloom furnace, blast furnace, brass melter, cupola, glass furnace, open-hearth furnace, and ceramic kiln and vitreous enameling oven (ferrous metals) when such appliances are larger than 100 cubic feet in size.

LOW HEAT INDUSTRIAL APPLIANCE	An industrial appliance developing temperatures below 600°F. in portions where substances or material are heated such as a building heating appliance for heating building spaces having a total volume exceeding 25,000 cubic feet except residential type appliances; a steam boiler operating at not over 50 pounds per square inch gauge pressure; a commercial cooking range; pressing machine boiler at any pressure; bake oven; candy furnace; stereotype furnace; drying and curing appliance; and other furnaces classified as low heat appliances. Appliances classified as medium-heat appliances may be considered as low-heat appliances if not larger than 100 cubic feet in size.
MEDIUM HEAT INDUSTRIAL APPLIANCE	An industrial appliance developing temperatures between 600°F. and 1500°F. in portions where substances or materials are heated such as an annealing furnace (glass or metal) ; charcoal furnace; galvanizing furnace; gas producer; commercial or industrial incinerator; and steam boiler operating at over 50 pounds per square inch gauge pressure. An appliance otherwise classified as a high heat appliance may be considered as a medium heat appliance if it is not larger than 100 cubic feet in size.
RESIDENTIAL TYPE APPLIANCE	Fuel burning or electric heating or cooking appliances not larger than 100 cubic feet in size (excluding any burner equipment and blower compartment) intended mainly for use in residences but which may be used also in other buildings. Such appliances shall include boilers, or heat exchangers, furnishing hot water at pressure not exceeding 160 psi and at temperatures not more than 250°F.; or steam at pressure not more than 15 psi; domestic water heaters furnishing hot water at not more than 200°F.; central, gravity, upflow, downflow, horizontal and duct furnaces furnishing warm air at not exceeding 250°F.; and cooking stoves and ranges; clothes dryers; fireplace stoves; domestic incinerators; laundry stoves; room heaters; heat pumps; floor furnaces; and wall furnaces.
HOISTWAY	An enclosed or partly enclosed shaft used for travel of an elevator, dumbwaiter, or platform.
HORIZONTAL EXIT	An exit consisting of protected openings through or around a fire wall, exterior wall, party wall or fire partition providing egress to an area of refuge on approximately the same level in the same or another building.
HORITONTAL FIRE LINE	A fire line supplying water installed in a one-story building supported horizontally on walls or columns and equipped with hose stations or a system of interconnected risers installed in a one-story building supplying hose stations with the interconnecting pipe being either below or above the floor.
HORIZONTAL SEPARATION	The distance in feet measured from any other building on the site, or from an interior lot line, or from the opposite side of a street or other public space to the building.
HOTEL	Any building including but not limited to any related structures, accessory buildings, and land appurtenant thereto, any part thereof, which: (1) contains ten or more units of dwelling space; or (2) has sleeping facilities for twenty-five or more persons.
IMMINENT PHYSICAL HAZARD	See 119.1.
IMPACT LOAD	The load of short duration resulting from moving machinery, elevators, craneways, vehicles, and other similar forces and kinetic loads.
INDUSTRIAL DUMBWAITER	See DUMWAITER, INDUSTRIAL.
INTERIOR FINISH	See 504.1.

LABELED	Equipment or materials to which has been attached a label of a nationally recognized testing laboratory that maintains periodic inspection of production of labeled equipment or materials and by whose labeling is indicated compliance with nationally recognized standards on the conduct of tests to determine suitable usage in a specified manner.
LAMINATING	A product made by bonding together two or more layers of a material or materials.
LATERAL SOIL LOAD	The lateral pressure due to the weight of the adjacent soil, including due allowance for hydrostatic pressure.
LISTED	Equipment or materials included in a list published by a nationally recognized testing agency that maintains periodic inspection of production of listed equipment or materials and whose listing states either that the equipment or material meets nationally recognized standards or has been tested and found suitable for use in a specified manner.
LIVE LOAD	The load superimposed by the use and occupancy of the building, not including the wind load, earthquake load, or dead load.
LOBBY	The enclosed vestibule between the principal entrance to the building and the foyer or where there is no foyer, the doors to the main floor of the auditorium or assembly room of a theater or place of assembly or to the main floor corridor of a business building.
LOT LINE	A line dividing one lot from another, or from a street or any public place.
INTERIOR LOT LINE	Any lot line other than one adjoining a street or public place.
STREET LOT LINE	A lot line dividing a lot from a street or other public space.
MAINTENANCE	See REPAIR.

MEMBER, PRIMARY	A member of the structural frame of a building used as a column, or a grillage beam or to support masonry walls or partitions; including trusses, isolated lintels spanning an opening of 8 feet or more, and any other structural member required to brace a column or a truss.
MEMBER, SECONDARY	Any member of the structural framework other than a primary member, including filling-in beams of the floor system.
MEZZANINE	See STORY.
MOTOR STAIRWAY	See ESCALATOR.
MOTOR VEHICLE REPAIR SHOP	See GARAGE.
MOTOR VEHICLE SERVICE STATION	See GARAGE.
NATIONALLY RECOGNIZED TESTING AGENCY	A laboratory such as the Underwriters' Laboratories, Inc., U.S. Bureau of Mines, Factory Mutual Laboratories or the American Gas Association Laboratories.
NONCOMBUSTIBLE	As applied to a building construction material means a material which, in the form in which it is used, falls in one of the following groups a. through c. It does not apply to surface finish materials nor to the determination of whether a material is noncombustible from the standpoint of clearances to heating appliances, flues or other sources of high temperature. No material shall be classed as noncombustible which is subject to increase in combustibility or flame spread rating beyond the limits herein established, through the effects of age, moisture or other atmospheric condition. Flame spread rating as used herein refers to ratings obtained according to accepted engineering practice. a. Materials no part of which will ignite when subjected to fire. Any materials which liberates flammable gas when heated to any

temperature up to 1380°F. for five minutes shall not be considered noncombustible within the meaning of this paragraph a.

b. Materials having a structural base of noncombustible material, as defined in a. with a surfacing not over 1/8 inch thick which has a flame spread rating not higher than 50.

c. Materials in the form and thickness used, other than as described in a. or b., having a flame spread not higher than 25 without evidence of continued progressive combustion and of such composition that surfaces that would be exposed by cutting through the materials in any way would not have a flame spread rating higher than 25 without evidence of continued progressive combustion.

NONCOMBUSTIBLE CONSTRUCTION — Buildings and structures of noncombustible construction are those in which the walls, partitions, structural elements, floors, ceilings and roofs, and the exits are constructed of approved noncombustible materials meeting the fire resistive requirements specified in this code for Type 2 construction.

OCCUPANCY — The purpose or activity for which a building or space is used or is designed or intended to be used.

OCCUPANCY LOAD — The number of individuals normally occupying a building, floor, room or space, for which the exit facilities shall be provided.

OCCUPATIONAL ROOM — A room or enclosed space designed as a place of employment in which the minimum clear ceiling heights are limited to 10 feet for assembly and industrial buildings and 9 feet for mercantile and business occupancies.

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

ORDINARY MATERIALS — Materials which do not conform to the requirements of this code for controlled materials.

OVERSIZED DUMBWAITER — See DUMBWAITER, INDUSTRIAL.

OWNER — The person possessing legal or equitable title. "Person possessing equitable title" shall mean that person or corporation, partnership, individual proprietorship, joint venture, firm, company or other legal entity that has actual control over the premises used in whole or in part as a place of employment.

PANEL BUILDING — The section of a floor or wall comprised between the structural frame of the building or structure and enclosed by the adjacent columns and primary supporting girders or column bands of the floor construction.

PENTHOUSE — See STORY.

PERSON — Includes corporation and copartnership as well as an individual.

PLACE OF ASSEMBLY — A room or space accommodating 75 or more individuals for religious, recreational, educational, political, social or amusement purposes or for the consumption of food and drink, including all connected rooms or spaces with a common means of entrance and exit.

PLACE OF EMPLOYMENT — Any building or other premises occupied by an employer in or about which an employee is suffered or permitted to work.

PLACE OF OUTDOOR ASSEMBLY — Premises used or intended to be used for public gatherings of 200 or more individuals in other than buildings.

PLAN FILING — Delivery in person or by mail of application, project data form, and fee; and when required, drawings and other related data to the offices of the Bureau of Engineering and Safety for approval and deposit in its records.

PLASTIC

PLASTIC CLASSIFICATION — See 501.4.B.

PLASTIC GLAZING — Material glazed or set in frame or sash and not held by mechanical fasteners which pass through the glazing material.

PLASTIC LIGHT-DIFFUSING SYSTEM — A suspended construction consisting in whole or in part of lenses, panels, grids or baffles made of approved plastic materials suspended below lighting fixtures.

PLASTIC ROOF PANELS — Approved plastic materials which are mechanically fastened to structural members or to structural panels or sheathing and which are used as light-transmitting media in roofs.

PLASTIC WALL PANEL — Approved plastic materials which are mechanically fastened to structural members or to structural panels or sheathing and which are used as light-transmitting media in exterior walls.

REINFORCED THERMO-SETTING PLASTIC — A thermosetting plastic reinforced with a glass fiber mat having not less than 1½ ounces of glass fiber per square foot.

THERMOPLASTIC MATERIAL — A solid plastic material which is capable of being repeatedly softened by increase of temperature and hardened by decrease of temperature.

THERMOSETTING PLASTIC MATERIAL — A solid plastic material which is capable of being changed into a substantially non-reformable product when cured under the application of heat or pressure.

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

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

PREFABRICATED — Fabricated prior to erection or installation in a building.

PRIMARY MEMBER — See MEMBER, PRIMARY.

PROFESSIONAL ENGINEER — A person licensed to practice professional engineering in New Jersey by the New Jersey Board of Engineers and Land Surveyors.

PROFESSIONAL OF RECORD — The professional engineer or architect who accepts the responsibility for the design of a project or part thereof to assure compliance with the legal requirements of the Department.

PROJECTING SIGN — See SIGN.

PUBLIC SPACE — A plot or area of land outside of a building dedicated or devoted to public use by legal mapping or any other lawful procedure.

QUALIFIED PERSON — A person selected and directed by an employer to perform a specific task or duty involving building construction who has the degree of competence necessary to accomplish the work in a safe manner.

REPAIR — The replacement or mending of existing work with equivalent materials for the purpose of its maintenance, but not including additional work that would affect safety, or affect required exit facilities, or a vital element of an elevator, plumbing, gas piping, wiring, ventilating or heating installation, or any work that would be in violation of a provision of the code or any other law governing building construction.

ROOF — The topmost slab or deck either flat or sloping with its supporting members, not including vertical supports.

ROOF COVERING CLASS A ROOF COVERING — Those which are effective against severe fire exposures and possess no flying brand hazard. In addition to roof coverings that are approved as Class A as a result of tests and listing by a nationally recognized testing laboratory, brick, concrete, tile, slate and metal shall be accepted as Class A roof coverings.

CLASS B ROOF COVERING	Those which are effective against moderate fire exposures and possess no flying brand hazard.
CLASS C ROOF COVERING	Those which are effective against light fire exposures and possess no flying brand hazard.
ROOF STRUCTURE	A structure above the roof of any part of a building enclosing a stair, tank, elevator machinery or ventilating apparatus, or part of a shaft which extends above the roof.
SCAFFOLD	Any platform which is elevated to support workmen, materials, or both.
SECONDARY MEMBER	See MEMBER, SECONDARY.
SELF-CLOSING	As applied to a fire door or other opening protective, means normally closed and equipped with an approved device which will insure closing after having been opened for use.
SERVICE EQUIPMENT	See BUILDING SERVICE EQUIPMENT.
SEVERE FIRE LOAD	Sec. 709.1.
SHAFT	An enclosed vertical opening or passage through two or more floors of a building or through floors and roof.
CLOSED SHAFT	An interior enclosed space extending through one or more stories of a building, connecting a series of two or more openings in successive floors, or floors and roof, and covered at the top.
OPEN SHAFT	An interior enclosed space extending through one or more stories of a building, enclosed with walls of the required weather and fire resistance for exterior walls, and open to the sky at the top.
SHALL	Indicates a mandatory requirement.
SHORT RISE MATERIAL LIFT	A power-operated raising and lowering device for transporting freight vertically, operating entirely within one story of a building or structure and having a rise not exceeding 15 feet.

SIGN	Includes billboards, closed signs, display signs, ground signs, marquise, open signs, pole signs, protecting signs, roof signs and wall signs.
SPRINKLER SYSTEM	
AUTOMATIC SPRINKLER HEAD	A device connected to a water supply system that opens automatically at a predetermined fixed temperature and disperses a stream of water.
AUTOMATIC SPRINKLER SYSTEM	An arrangement of piping and heat-actuated devices designed to operate automatically by the heat of fire and to discharge water upon the fire.
CENTRAL STATION SYSTEM	An automatic sprinkler system in which all equipment is supervised by a central or proprietary station to which all alarm signals are transmitted and relayed to the municipal fire department.
CHEMICAL SPRINKLER SYSTEM	A system of automatic sprinklers controlled by thermostatic operating devices for the diffusion of approved fire-extinguishing chemicals or gases.
DELUGE SYSTEM	A sprinkler system designed without water in the piping to deliver large quantities of water through open sprinkler heads, in which the water supply is controlled by a valve actuated by a thermostatic device on a predetermined temperature or rate of temperature rise or a smoke responsive device, independent of the sprinklers.
DRY PIPE SYSTEM	A system in which all pipes and sprinkler heads are filled with air under pressure and the water supply is controlled by an approved automatic dry-pipe valve in the event of fire, actuated either by the release of air or by thermostatic electric control.
NON-AUTOMATIC SPRINKLER SYSTEM	A sprinkler system designed for use by the fire department in which all pipes are maintained dry and which is equipped with a siamese fire department connection.

ONE-SOURCE SPRINKLER SYSTEM — An automatic sprinkler system which is supplied from one approved source of water supply.

PARTIAL SPRINKLER SYSTEM — An automatic sprinkler system consisting of a limited number of automatic sprinkler heads serviced from the building water supplies with one or more fire department siamese connections as required, for use in exit facilities and isolated hazardous locations.

SUPERVISED SPRINKLER SYSTEM — A system in which all water supply valves and accessory equipment is provided with electrical contact devices to transmit signals to an outside central supervisory station.

THERMOSTATIC SPRINKLER SYSTEM — An open or closed head sprinkler system operated through an auxiliary thermostatic device which functions at a predetermined rate of temperature rise.

TWO-SOURCE SPRINKLER SYSTEM — An automatic sprinkler system which is supplied from a combination of any two of the approved sources of water supply, from two pressure tanks or by direct connections to the municipal water supply on two streets in which the water mains are separately controlled.

WATER CURTAIN — A system of approved open or closed sprinkler heads or perforated pipes installed on the exterior of a building at eaves, cornices, window openings, and on mansard or peak roofs with water supply under manual control.

WATER SPRAY — Installed around openings in floors or walls using spray nozzles thermostatically controlled and connected to the water supply system.

WET PIPE SPRINKLER SYSTEM — A system of automatic sprinklers in which all pipes are filled with water at all times.

STAGE — A portion of a place of assembly or building which is used for presentations of plays and other entertainments, wherein scenery, drops, or other effects may be installed or used, and where the distance between the top of the proscenium opening and the ceiling of the stage is more than 5 feet.

STAIR — One or more flights of stairs and the necessary landings and platforms connecting them to form a continuous and uninterrupted passage from one floor to another.

STANDPIPE — A wet or dry fire line supplying water installed exclusively for the fighting of fire, extending from the lowest to the topmost story of a building or structure with hose outlets at every floor equipped with reducing valves and designed to operate at required working pressure.

DRY STANDPIPE — A standpipe fire line without permanent or automatic water supply with a siamese connection for use of the fire department.

FIRST AID STANDPIPE — An auxiliary vertical or horizontal fire line designed primarily for emergency use by the occupants of the building or by the private fire brigade before the arrival of the municipal fire department.

WET STANDPIPE — A standpipe fire line having a primary water supply constantly available at every hose outlet, or made available by opening the hose outlet or by automatic functioning of a control station.

STORY — That part of a building between a floor and the floor or roof next above. A mezzanine shall be considered a story if it exceeds 33⅓ percent of the area immediately below or exceeds 2,500 square feet with an assigned number of employees or exceeds 10,000 square feet in any case. A penthouse shall be considered a story if it exceeds 33⅓ percent of the roof area or exceeds 2,500 square feet with an assigned number of employees or exceeds 10,000 square feet in any case.

STORY HEIGHT	See HEIGHT.
STREET	A primary thoroughfare or highway 30 feet or more in width which is dedicated or devoted to public use by legal mapping, user, or other lawful means.
STREET FLOOR	A floor usually the principal entrance floor, which is not more than ½ story above or below grade at the location from which egress is provided to the street.
STRUCTURE	An assembly of materials forming a construction for occupancy or use including among others, stadiums, tents, reviewing stands, platforms, stagings, observation towers, radio towers, tanks, trestles, piers, wharves, open sheds, coal bins, shelters, fences, and display signs.
TON REFRIGERATION	The unit of capacity of refrigeration equivalent to the removal of heat at the rate of 12,000 Btu per hour.
UNFIRED PRESSURE VESSEL	A closed metal vessel which contains air, steam, gas or liquid pressure in excess of 15 pounds per square inch gauge which is supplied from an external source.
UNLIMITED AREA BUILDING	A building or structure that does not comply with the tabular areas of Table 401.1.
USE GROUP	The classification of a building or structure based on the purpose for which it is used.
VENTILATION	The process of supplying or removing air by natural or mechanical means to or from any space. Such air may or may not have been conditioned.
VERTICAL EXIT	A stair, ramp or escalator, serving as an exit from one or more floors above or below the street floor.
WALL	
BEARING WALL	A wall which supports any vertical load in addition to its own weight.

CAVITY WALL	A wall built of masonry units or concrete, or a combination of these materials, arranged to provide a continuous air space within the wall, and in which the inner and outer parts of the wall are tied together with metal ties.
CURTAIN WALL	A non-bearing wall not supported at each story.
FACED WALL	A wall in which the masonry facing and backing are so bonded as to exert common action under load.
FIRE PARTITION	A partition which subdivides a story of a building to provide an area of refuge, stair shaft, or other exit so as to restrict the spread of fire.
FIRE WALL	A wall having adequate fire resistance and structural stability under fire conditions to accomplish the purpose of completely subdividing a building or of completely separating adjoining buildings to resist the spread of fire.
FOUNDATION WALL	A wall below the floor nearest grade serving as a support for a wall, pier, column, or other structural part of a building.
HOLLOW MASONRY WALL	A wall built of masonry units so arranged as to provide an air space within the wall, and in which the facing and backing of the wall are bonded together with masonry units.
NON-BEARING WALL	A wall which supports no vertical load other than its own weight.
PANEL OR SKELETON WALL	A non-bearing wall supported at each story on a skeleton frame.
PARAPET WALL	That part of any wall entirely above the roof line.
PARTY WALL	A wall on an interior lot line used or adapted for joint service by two contiguous buildings.
PLASTIC WALL PANEL	See PLASTIC.

VENEERED WALL	A wall having a facing or other weather-resisting noncombustible materials securely attached to the backing, but not so bonded as to exert common action under load.
WATER CURTAIN	See SPRINKLED SYSTEM.
WATER SPRAY	See SPRINKLED SYSTEM.
WIND LOAD	The lateral pressure on the building or structure exerted by the wind.
WRITING	Construed to include handwriting, typewriting, printing, photo-offset or any other form of reproduction in legible symbols or characters.
WRITTEN NOTICE	A notification in writing delivered in person to the individual or to the parties intended or delivered at or sent by mail to the last business address known to the party giving the notice.
YARD	An open unoccupied space on the same lot with a building extending along the entire length of a street, or rear, or interior lot line.

ARTICLE 3

OCCUPANCY AND CONSTRUCTION CLASSIFICATIONS

SEC. 300.0 SCOPE.

This Article of the code shall regulate the classification of all buildings in respect to use group, type of construction, and fire hazard for the purpose of controlling the size and location of buildings.

SEC. 301.0 USE GROUP CLASSIFICATIONS.

301.1 ALL USE GROUPS. All buildings and structures shall be classified in one of the use groups specified in Table 301.1 and in accordance with accepted engineering practice.

Table 301.1
Use Group Classifications

USE GROUP	OCCUPANCY
A-1	Extreme High Hazard
A-2	High Hazard
B-1	Moderate Hazard Storage
B-2	Low Hazard Storage
C	Mercantile
D	Industrial
E	Business
F-1A	Assembly—Theater with stage
F-1B	Assembly—Theater without stage
F-2	Assembly—Night clubs and concert halls
F-3	Assembly—Recreation centers, lecture halls, terminals, bowling alleys, restaurants other than night clubs
F-4	Assembly—Churches
G	Outdoor assembly

301.2 HAZARDOUS USE—GROUP A. All buildings and structures or parts thereof shall be classified in the hazardous use group when used for the storage, manufacture or processing of highly flammable or explosive products or materials likely to burn with extreme rapidity or which may produce poisonous

fumes or explosions; for storage or manufacturing which involves highly corrosive, toxic or noxious alkalies, acids or other liquids or chemicals producing flame, fume, explosive, poisonous, irritant or corrosive gases; and for the storage or processing of any materials, producing explosive mixtures of dust or fine particles subject to spontaneous ignition.

A. Extreme High Hazard—Group A-1. Extreme high hazard uses shall include all process, materials, products of manufacture and storage of live ammunition, explosives (as defined by the New Jersey Revised Statutes, Title 21, Explosives Law) military pyrotechnics, pyrotechnic material, signals and flares, and fireworks. The occupancies shall be classified as extreme high hazard use group A-1 in accordance with accepted engineering practice.

B. High Hazard—Group A-2. High hazard occupancies shall include those having contents that are liable to burn with extreme rapidity or from which poisonous fumes or extremely rapid pressure rises or explosions are to be expected in the event of fire. Such high hazard uses are not limited to but are indicative of the processes, materials, including their storage, of products or partial products of manufacture. These occupancies shall be classified as high hazard use Group A-2, in accordance with accepted engineering practice.

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

A. Moderate Hazard—Group B-1. Buildings used for the storage of moderate hazard contents which are likely to burn with moderate rapidity but which do not produce either poisonous gases, fumes or explosions. These occupancies shall be classified as moderate hazard storage use Group B-1.

B. Low Hazard—Group B-2. Buildings used for the storage of noncombustible materials, and of low hazard wares that do not ordinarily burn rapidly or with excessive smoke and from which neither poisonous fumes or explosions are to be expected in case of fire. Combustible storage with a fire load rating of 24,000 Btu per square foot or less shall be considered as low hazard storage provided that not more than 25 percent of the gross area exceeds the maximum fire load limit of 24,000 Btu per square foot. These occupancies shall be classified as low hazard storage use group B-2 in accordance with accepted engineering practice.

301.4 Mercantile Use—Group C. All buildings and structures or parts thereof used for the displaying, selling or buying of goods, wares or merchandise shall be classified in the mercantile use group; including among others, retail stores, salesrooms, markets, department stores, discount houses, supermarkets and shopping centers. Highly combustible goods, such as merchandise made of proxylin products, shall be limited to small quantities that do not constitute a high hazard; and if not so limited, the construction shall comply with the requirements of the hazardous use group as required by the provisions of this section, Article 7, and Tables 401.1 and 505.0.

301.5 Industrial Uses—Group D. All buildings and structures, or parts thereof, in which occupants are engaged in performing work or labor in fabricating, assembling or processing of products or materials shall be classified in the industrial use group; including among others factories, assembling plants, testing laboratories, motor vehicle service and repair shops, research and development laboratories and all other industrial and manufacturing uses, except those involving highly flammable or explosive products and materials of hazardous use groups. The processes and manufacturing operations shall be classified as industrial use group in accordance with accepted engineering practice.

301.6 Business Use—Group E. All buildings and structures or parts thereof shall be classified in the business use group when used for the transaction of business, for the rendering of professional and similar services that may involve the incidental storage of stocks of goods, wares, or merchandise in limited quantities only; including among others, television studios and stations, radio stations, telephone exchanges, and similar establishments.

301.7 Assembly Use—Group F. All buildings and structures, or parts thereof shall be classified in the assembly use group when used or designed as places of assembly when defined as follows:

A. Theaters With Fixed Seats and Stage—Group F-1A. Such structures shall include all theaters and other buildings used primarily for theatrical or operatic performances and exhibitions, arranged with a raised stage, proscenium curtain, fixed or portable scenery or scenery loft, lights, motion picture booth, mechanical appliances or other theatrical accessories and equipment and provided with fixed seats.

B. Theaters With Fixed Seats and No Stage—Group F-1B. Such structures shall include all theaters without a stage and equipped with fixed seats used for motion picture performances.

C. Night Clubs and Concert Halls Without Stages—Group F-2. Such structures shall include all buildings and places of public assembly, without theatrical stage accessories, designed for use as night clubs

and for similar purposes including all rooms, lobbies and other spaces connected thereto with a common means of entrance and exit.

D. Art Galleries, Lecture Halls and Recreation Centers Without Stages—Group F-3. Such structures shall include all buildings with or without an auditorium in which persons assemble for amusement, entertainment or recreation which may include incidental motion picture, dramatic, theatrical or educational presentations. Other similar uses without theatrical stage other than a raised platform, and principally used without permanent seating facilities are in this classification. Included among these uses are art galleries, museums, lecture halls, libraries, skating rinks, dance halls, club rooms, lodge rooms, recreation centers, bowling alleys, passenger terminals, and restaurants other than night clubs.

E. Churches—Group F-4. Such structures shall include all buildings used as churches and for similar religious purposes.

301.8 Outdoor Assembly Use—Group G. Such structures shall include grandstands, bleachers, coliseums, stadiums, drive-in theaters, tents and similar structures for outdoor assembly use.

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

301.10 Special Use. Special industrial buildings and other structures not covered by Sec. 301.0 and those buildings involving unusual fire and explosion risks or occupied by large numbers of people subject to life and panic hazards shall comply with Article 7.

301.11 Doubtful Use. When a building or structure is proposed for a use not specifically provided for in this code or the classification of which is doubtful, such building or structure shall be placed in the use group it most nearly resembles with respect to the life and fire hazard.

301.12 Incidental Use. Where the higher hazard is incidental to the main use of the building and the area devoted to such use is segregated by fire resistive construction as required in Article 5, the building shall be classified according to the main use.

301.13 Mixed Use and Occupancy.

A. When a building is occupied by two or more uses not included in the same use group, the provisions of this code applying to each use shall

apply to such parts of the building as come within that group; and if there are conflicting provisions, the requirements securing the greater safety shall apply to the entire building.

B. When mixed uses are completely separated horizontally and vertically from adjoining occupancies by fire divisions of the highest fire grading prescribed in Table 303.1 for the separated uses, each part of the building shall be separately classified as to use.

Sec. 302.0 Construction Classification.

302.1 Construction Classes. All buildings and structures shall be classified in any one or in a combination of the four construction types as defined: Type 1, Fire Resistive Construction; Type 2, Noncombustible Construction; Type 3, Exterior Masonry Wall Construction; and Type 4, Frame Construction. The fire resistance ratings for each element of the construction shall be not less than required by Table 505.0.

302.2 Type 1—Fire-Resistive Construction. Buildings and structures of fire-resistive construction are those in which the walls, partitions, structural elements, floors, ceilings, and roofs, and the exit are constructed and protected with noncombustible materials to afford the fire resistance specified in Table 505.0, except as provided by Article 4. Fire resistive buildings shall be further classified as Types 1-A and 1-B.

A. Type 1-A—Fire-resistive 3-Hour Floors. Structures of Type 1-A (fire-resistive 3-hour floors) shall include all buildings of fire-resistive construction in which the floors are constructed or protected to furnish a fire resistance rating of 3 hours as provided by Table 505.0.

B. Type 1-B—Fire-resistive 2-Hour Floors. Structures of Type 1-B (fire-resistive 2-hour floors) shall include all buildings of fire-resistive construction in which the floors are constructed or protected to furnish fire-resistance rating of 2 hours as provided in Table 505.0.

302.3 Type 2—Noncombustible Construction. Buildings and structures of noncombustible construction are those in which the walls, partitions, structural elements, floors, ceilings and roofs, and the exit are constructed of approved noncombustible materials meeting the fire resistance ratings of Table 505.0, except as modified by the fire limit limitations of Sec. 404.0. Noncombustible buildings shall be further classified as Types 2-A, 2-B and 2-C.

A. Type 2-A—Noncombustible 1½ Hour Protected. Structures of Type 2-A (noncombustible 1½ hour protected) shall include all buildings of noncombustible construction in which the structural framework is protected to develop a fire resistance rating of 1½ hours as provided in Table 505.0.

B. **Type 2-B—Noncombustible ¾ Hour Protected.** Structures of Type 2-B (noncombustible ¾ hour protected) shall include all buildings of noncombustible construction in which the structural framework is protected to develop ¾ hour fire resistance rating of ¾ hours as provided in Table 505.0.

C. **Type 2-C—Noncombustible Unprotected.** Structures of Type 2-C (noncombustible unprotected) shall include all buildings of noncombustible construction in which the structural framework is unprotected as provided in Table 505.0.

302.4 TYPE 3—EXTERIOR MASONRY WALL CONSTRUCTION. Buildings and structures of exterior masonry wall construction are those in which the exterior, fire and party walls are constructed of approved masonry or reinforced concrete proportioned for the required strength and stability for the use and occupancy as specified in Article 8, or in which the exterior walls are of protected steel or reinforced concrete skeleton construction of the required fire resistance and structural properties; and the floors, roofs, and interior framing are wholly or partly of wood or of steel or other approved construction; the fire and party walls are ground supported; except that girders and their supports carrying walls of masonry shall be protected to afford the same degree of fire resistance as the walls supported thereon; and all structural elements have the required fire resistance ratings specified in Table 505.0.

A. Type 3-A—Heavy Timber Mill Construction. Structures of Type 3-A (heavy timber mill) construction shall include all exterior masonry wall buildings in which the interior structural members consist of heavy timbers with flat surfaces, with all sharp projections and concealed or inaccessible spaces eliminated, with heavy plank floor and roof construction, all having the minimum dimensions herein specified; or in which the interior structural members consist of protected metal, reinforced concrete or other approved construction of the fire resistance specified in Table 505.0.

(1) *Columns.*

a. Wooden columns shall be not less than 8 inches, nominal, in any dimension when supporting floor loads and not less than 6 inches, nominal, in least dimension and not less than 8 inches, nominal, in other dimension when supporting roof loads only.

b. Columns shall be continuous or superimposed throughout all stories on each other, by means of reinforced concrete or metal caps with brackets or be connected by properly designed steel or iron caps, pintels and base plates or by timber

splice blocks affixed to the columns by means of connectors housed within the contact faces, or other approved methods.

c. Columns of materials other than wood shall have a fire resistance rating of not less than ¾ hour.

d. Columns shall not rest on floor timbers; nor shall they rest on masonry foundations unless stone, cast iron or steel bases are used to transmit their loads.

(2) *Floor framing.*

a. Beams and girders of wood shall be not less than 6 inches, nominal, in width and not less than 10 inches, nominal, in depth.

b. Arches which spring from grade or the floor line and support floor loads shall be not less than 8 inches, nominal, in any dimension.

c. Framed timber trusses supporting floor loads shall have members of not less than 8 inches, nominal, in any dimension.

(3) *Roof framing.*

a. Arches for roof construction which spring from grade or the floor line and do not suport floor loads shall have members not less than 6 inches, nominal, in width and not less than 8 inches, nominal, in depth for the lower half of the height and not less than 6 inches, nominal, in depth for the upper half.

b. Arches for roof construction which spring from the top of walls or wall abutments, timber trusses, and other roof framings which do not support floor loads, shall have members not less than 4 inches, nominal, in width and not less than 6 inches, nominal, in depth. Spaced members may be composed of two or more pieces not less than 3 inches, nominal, in thickness, when blocked solidly throughout their intervening spaces or when such spaces are tightly closed by a continuous wood cover plate of not less than 2 inches, nominal, in thickness, secured to the underside of the members. Splice plates shall be no less than 3 inches, nominal, in thickness. When protected by approved automatic sprinklers under the roof deck, framing members shall be not less than 3 inches, nominal in width.

(4) *Floors.*

a. Floors shall be without concealed spaces and shall be constructed of splined or tongued and grooved plank not less than 3 inches, nominal thickness, covered with 1-inch, nominal dimension, tongued and grooved flooring, laid crosswise or diagonally to the plank, or of laminated planks not less than 4 inches, nominal width set on edge close together spiked at intervals of 18 inches and covered with 1-inch, nominal dimension, flooring. In laminated floors the planks shall be laid with broken joints so that no continuous line will occur across the floor. Laminated floors shall not be spiked to the supporting girders. Joints of the planking shall be over supports or at the quarter points with no more than ⅔ of the joints at such quarter points. Joints between planks shall be tight.

b. Flooring shall not extend closer than ½ inch to walls to provide an expansion joint. This joint shall be covered at top or bottom in such manner as not to obstruct an expansive movement of the floor.

(5) *Roofs.*

a. Roofs shall be without concealed spaces except that building service equipment may be enclosed in a room used for no other purpose and cut off from the balance of the building by construction having a fire resistance rating of not less than 1 hour.

b. Roof decks shall be matched or splined planks not less than 2 inches, nominal thickness; or laminated planks not less than 3 inches nominal thickness, set on edge close together and laid as required for floors; or approved 1⅛ inch thick 2-4-1 exterior glue, tongue and groove plywood, with all end joints staggered and butting on centers of beams spaced not over 4 feet apart; or other forms of roof decks, if of noncombustible material.

B. Type 3-B—Ordinary Protected Construction. Structures of Type 3-B (ordinary protected) construction shall include all exterior masonry wall buildings in which the interior structural elements are wholly or partly of fire-protected wood of not less than 2 inch nominal thickness, or of other approved protected combustible materials, or of metal, protected and insulated to afford a fire resistance rating of not less than ¾ hours as provided by Table 505.0.

C. Type 3-C—Ordinary Unprotected Construction. Structures of Type 3-C (ordinary unprotected) construction shall include all exterior masonry wall buildings in which the interior structural members are of wood not less than 2 inch nominal thickness or consist of other combustible materials by a fire resistance rating of not less than ¾ hours as provided by Table 505.0.

302.5 TYPE 4—WOOD FRAME CONSTRUCTION. Buildings and structures of frame construction are those in which the exterior walls, bearing walls, partitions, floor and roof construction are constructed wholly or partly of wood stud and joist assemblies with a minimum nominal dimension of 2 inches, or of other approved combustible materials; with fire-stopping at all vertical and horizontal draft openings as provided by Article 5 and in which the structural elements have the fire resistance ratings specified in Table 505.0. Frame buildings shall be further classified as Types 4-A and 4-B.

A. Type 4-A—Wood Frame Protected. Wood structures of Type 4-A (wood frame protected) shall include all buildings of frame construction in which the exterior walls and interior structural members are protected to develop a fire resistance rating of not less than ½ hour as provided by Table 505.0.

B. Type 4-B—Wood Frame Unprotected. Structures of Type 4-B (wood frame unprotected) shall include all buildings of wood frame construction in which the exterior walls and interior structural members are unprotected as provided by Table 505.0.

302.6 MINIMUM CONSTRUCTION. When a type of construction is used that is superior to the minimum required for the construction type for any specific use, height and area of the building, nothing in this code shall be construed to require full compliance with the higher type, but the designated construction class of the building shall be that of the lesser requirements unless all the requirements for the higher type are fulfilled.

SEC. 303.0 FIRE GRADING.

303.1 SEPARATIONS. The fire grading specified in Table 303.1 shall determine the minimum fire resistance rating for fire walls and fire divisions both vertical and horizontal which segregate mixed uses.

Table 303.1

Fire Separation of Use Groups

Use Group and Class	Description	Minimum Fire Resistance Rating of Principal Structural Parts (1) (2) Hours
A-2	High Hazard (3)	4
B-1	Storage; moderate hazard	3
B-2	Storage; low hazard	2
C	Mercantile	3
D	Industrial	2
E	Business	2
F-1	Assembly; theaters	3
F-2	Assembly; night clubs	3
F-3	Assembly; recreation centers, lecture halls, terminals, restaurants	2
F-4	Assembly; churches	1½

Notes to Table

1. Where the building is 2 stories or less in height, a fire separation of 2 hours shall be acceptable in all occupancies other than churches where a fire separation of 1 hour shall be acceptable.
2. See Table 505.0.
3. For Class A-1 extreme high hazard use group, see Article 7.

303.2 Modification. The Bureau may modify the fire separation of a building in any use group if it is determined by inspection or certified by adequate supporting data that the existing or proposed fire hazard varies from that established in this code for that use group, but in no case shall there be a decrease in the fire resistance ratings of Table 505.0.

303.3 Special Hazards. When necessary to resist a higher degree of fire severity than provided in Sec. 303.0, the Bureau may exceed the fire resistance ratings for the elements of construction in any building and the fire separation of the use group.

ARTICLE 4

GENERAL BUILDING RESTRICTIONS

Sec. 400.0 Scope.

This Article of the code shall control the limitations of height and area of all new buildings and additions to existing buildings, the restriction of use and type of construction in reference to location within the fire limits and the permissible encroachment of buildings on public property and other legally required open areas.

Sec. 401.0 General Area and Height Limitations.

401.1 Area Limits. The area of all buildings between exterior enclosure walls or between exterior walls and fire walls shall not exceed the limits established in Table 401.1 except as provided by Sec. 402.0. The area specified in Table 401.1 shall apply to buildings facing on a street not less than 30 feet in width, or on a public space not less than 30 feet in width which is accessible to a street.

401.2 Height Limits. The heights of all buildings between exterior enclosure walls or between exterior walls and fire walls shall not exceed the limits established in Table 401.1 except as provided by Sec. 403.0. The height in feet and the number of stories specified in Table 401.1 shall apply to all buildings and to all separate parts of a building enclosed within the permissive or required enclosure walls and fire walls.

401.3 Increase in Height and Area. The height or area of an existing building or structure shall not be increased unless it is of a type of construction permitted for new buildings of the increased height and area, and use group within the fire limits in which it is located and as provided in Table 401.1.

401.4 Existing Excessive Area. Any building heretofore approved which exceeds the maximum allowable area permitted by this Article 4 may be extended if the addition is separated from the existing building by an approved fire wall and the additional area does not exceed the limits for the specific use group and type of construction as set forth in this Article.

Table 401.1

General Height and Area Limitations of Buildings Facing on One Street or Public Space not less than 30 Feet Wide

Areas in Square Feet, Heights in Number of Stories and Feet N.P.—Not Permitted ⊠ Unrestricted

USE GROUP		TYPE OF CONSTRUCTION									
		TYPE 1		TYPE 2			TYPE 3			TYPE 4	
		FIRE-RESISTIVE		NONCOMBUSTIBLE			EXTERIOR MASONRY WALLS			FRAME	
				Protected		Unprot.	Heavy Timber (Mill)	Ordinary (Joisted)		Protected	Unprot.
								Protected	Unprot.		
		1A	1B	2A	2B	2C	3A	3B	3C	4A	4B
A-1 A-2	Explosives High Hazard other than Explosives	5 sty.65' 14,000	3 sty. 40' 11,000	3 sty. 40' 7,000	2 sty. 30' 6,000	1 sty. 20' 3,500	2 sty. 30' 6,000	2 sty. 30' 5,000	1 sty.20' 3,500	1 sty. 20' 3,000	N.P.
B-1	Storage - Moderate	⊠	5 sty. 65' 22,000	5 sty. 65' 14,000	4 sty. 50' 10,000	2 sty. 30' 7,000	4 sty. 50' 10,000	3 sty. 40' 9,000	2 sty. 30' 7,000	2 sty. 30' 5,000	1 sty. 20' 3,500
B-2	Storage - Low	⊠	⊠	7 sty. 85' 24,000	5 sty. 65' 18,000	3 sty. 40' 12,000	5 sty. 65' 18,000	4 sty. 50' 16,000	3 sty. 40' 12,000	3 sty. 40' 9,000	2 sty. 30' 6,000
C	Mercantile	⊠	12sty135' 25,000	6 sty.75' 16,000	4 sty. 50' 12,000	2 sty.30' 8,000	4 sty. 50' 12,000	3 sty. 40' 10,000	2 sty. 30' 8,000	2 sty. 30' 6,000	1 sty. 20' 4,000
D	Industrial	⊠	12sty135' 25,000	6 sty.75' 16,000	4 sty. 50' 12,000	2 sty.30' 8,000	4 sty. 50' 12,000	3 sty. 40' 10,000	2 sty. 30' 8,000	1 sty. 20' 5,000	N.P.
E	Business	⊠	⊠	7 sty.85' 24,000	5 sty. 65' 18,000	3 sty.40' 12,000	5 sty. 65' 18,000	4 sty.50' 16,000	3 sty. 40' 12,000	3 sty. 40' 9,000	2 sty.30' 6,000
F-1-A	Assembly Theatres — With Stage & Scenery	⊠	6 sty. 75' 12,000	4 sty.50' 8,000	2 sty. 30' 6,000	1 sty.20' 4,000	2 sty. 30' 6,000	2 sty.30' 5,000	1 sty. 20' 4,000	1 sty. 20' 3,000	N.P.
F-1-B	Assembly Theatres — Without Stage (Motion Pic. Theatres)	⊠	9 sty.100' 22,000	5 sty.65' 14,000	3 sty. 40' 10,000	2 sty.30' 7,000	3 sty. 40' 10,000	3 sty.40' 9,000	2 sty. 30' 7,000	1 sty. 20' 5,000	1 sty.20' 3,500
F-2	Assembly-Night Clubs & Similar Uses	⊠	4 sty. 50' 6,000	3 sty.40' 4,000	2 sty. 30' 3,000	1 sty.20' 2,000	2 sty. 30' 3,000	2 sty.30' 2,500	1 sty. 20' 2,000	1 sty. 20' 1,500	1 sty.20' 1,000
F-3	Assembly - Lecture Halls - Recreation Centers - Terminals - Restaurants other than Night Clubs	⊠	9 sty.100' 22,000	5 sty.65' 14,000	3 sty. 40' 10,000	2 sty.30' 7,000	3 sty. 40' 10,000	3 sty.40' 9,000	2 sty. 30' 7,000	1 sty. 20' 5,000	1 sty.20' 3,500
F-4	Assembly - Churches	⊠	9 sty.100' 25,000	5 sty.65' 16,000	3 sty. 40' 12,000	2 sty.30' 8,000	3 sty. 40' 12,000	3 sty.40' 10,000	2 sty. 30' 8,000	1 sty. 20' 6,000	1 sty.20' 4,000

Notes to Table

1. For street-frontage increase in area, see 402.1.
2. For sprinkler increase in area, see 402.A.
3. For horizontal fire line increase in area, see 402.2.B.
4. For automatic venting increase in area, see 402.3.
5. For decrease in area for multi-story building, see 402.4.
6. For maximum total area, see 402.5.
7. For unlimited area, see 402.6 and 402.7.
8. For increase in height when sprinklered, see 403.2.
9. For special building requirements, see Article 7.
10. Storage buildings within the property lines of industrial premises shall be limited to the restrictions of use group D.

Sec. 402.0 Area Exceptions.

402.1 Street Frontage Increase.

A. When a building or structure has more than 25 percent of the building perimeter fronting on a street or other accessible unoccupied space not less than 30 feet in width leading to a street, the tabular areas may be increased two percent for each one percent of such excess frontage.

B. When a portion of an existing building or structure perimeter affording frontage area increase is built upon but separated by a fire wall, the length of the fire wall may be considered for perimeter frontage credit providing the exterior wall opposite the fire wall has the required 30 feet accessibility.

402.2 Sprinkler or Horizontal Fire Line Increase.

A. When a building is equipped with an approved automatic sprinkler system, the tabular area may be increased 100 percent for multi-story and 200 percent for one-story buildings unless such sprinkler system is required by Articles 7 or 13.

B. When a one-story building is not equipped with an automatic sprinkler system, the tabular area may be increased by 50 percent when a horizontal fire line is installed in accordance with Sec. 1303.0.

402.3 Automatic Venting Increase. When a one-story building in other than hazardous use group is equipped with an approved sprinkler system and approved automatic heat and smoke venting devices complying with Sec. 1309.0, the tabular area may be increased 50 percent for a ratio of venting area to floor area of ¼ of one percent, 75 percent for a ratio of ½ of one percent, and 100 percent for a ratio of ¾ of one percent.

402.4 Multi-Story Reduction. Buildings 2 stories in height may be built to the same area limits provided in Table 401.1 for one-story buildings. In buildings over 2 stories in height, the area limits of Table 401.1 for one-story buildings shall be reduced for each story height over 2 stories in all use groups as specified in Table 402.4.

Table 402.4

Building Construction	Area Reduction
Type 1-A and 1-B	No reduction
Type 2-A	1/20 of area
Types 2-B, 2-C, 3-A, 3-B, 3-C and 4-A	
3 Story	1/10 of area
Over 3 Story	1/5 of area

402.5 Maximum Total Area. The maximum increase in floor area under the combined provisions of this Article shall not provide a total area in excess of 3½ times the tabular area of Table 401.1 for multi-story buildings and 5½ times for one-story buildings in accordance with accepted engineering practice.

402.6 Storage and Industrial Buildings of Unlimited Area.

A. This 402.6 shall not apply to buildings of storage and industrial occupancies that are unrestricted in area by Table 401.1 or to buildings of storage and industrial occupancy that are of Type 4 construction.

B. Building of storage and industrial occupancies may be unlimited in area when they are located outside the fire limits and comply with 402.6.

C. Storage and industrial occupancies shall be separated from other buildings and property lines in accordance with Table 402.6.C.

Table 402.6.C

Building Construction	Minimum Horizontal Separation Feet
Types 1-A and 1-B	30
Type 2-A	30
Type 2-B	40
Type 2-C	50
Type 3-A and 3-B	40
Type 3-C	50

D. The exit facilities shall comply with Sec. 618.0 or 619.0.

E. The entire building shall be equipped with automatic sprinkler protection except areas housing noncombustible materials may not be required to have automatic sprinkler protection, when approved by the Bureau.

F. All combustible framing materials, where permitted, shall be fire retarded.

G. Windowless buildings shall be provided with access for the fire department.

H. Hose connections, fire hose and hydrants shall be installed.

I. Sufficient water shall be available for sprinkler heads and hose lines.

J. Emergency light and power shall be provided in unlimited area buildings for means of egress and services.

K. Storage and industrial buildings shall not exceed 1 story or 85 feet in height.

L. In buildings Type 2-C and Type 3-C construction, the fire load shall not exceed an average throughout the building of 80,000 Btu per square foot, nor shall the fire load in more than 25 percent of the building exceed 80,000 Btu per square foot, nor shall the fire load in any bay exceed 400,000 Btu per square foot.

M. In buildings of Types 2-B, 3-A and 3-B construction, the fire load shall not exceed an average throughout the building of 120,000 Btu per square foot, nor shall the fire load in more than 25 percent of the building exceed 120,000 Btu per square foot, nor shall the fire load in any bay exceed 400,000 Btu per square foot.

N. In buildings of Type 2-A construction, the fire load shall not exceed an average throughout the building of 160,000 Btu per square foot, nor shall the fire load in more than 25 percent of the building exceed 160,000 Btu per square foot, nor shall the fire load in any one bay exceed 400,000 Btu per square foot.

O. The fire load of any area in an unlimited area building separated by fire walls or fire resistive partitions shall be excluded provided the area enclosed in such fire walls or fire resistive partitions is within the tabular areas of Table 401.1.

P. The building shall be provided with heat and smoke vents with an area of ¾ of one percent of the floor area.

Q. In buildings exceeding 100,000 square feet in area, an approved plant fire brigade shall be maintained with adequate mobile fire fighting equipment at all times during occupancy of the building.

R. In buildings exceeding 100,000 square feet in area, an approved control center shall be provided for the use of the disaster control organization in accordance with the State Plant Protection Service.

402.7 Mercantile Buildings of Unlimited Area.

A. This 402.7 shall not apply to buildings of mercantile occupancy that are unrestricted in area by Table 401.1 or to buildings of mercantile occupancy that are of Type 4 construction.

B. Buildings of mercantile occupancy may be unlimited in area when they are located outside the fire limits and comply with 402.7.

C. Mercantile occupancies shall comply with 402.6.C through 402.6.J.

D. One story mercantile buildings shall comply with Table 505.0 and be at least Type 2-B construction.

E. Two story mercantile buildings shall comply with Table 505.0 and the first story shall be at least Type 2-A construction and the second story at least Type 2-B construction.

F. The basements in all mercantile buildings shall be Type 1-A construction.

G. Mercantile buildings over two story and their basements shall be Type 1-A construction, except when the building is less than 70 feet in height, the top story may be Type 2-B construction.

H. The building shall be provided with heat and smoke vents with an area of ¾ of one percent of the floor area or an emergency exhaust system with a minimum ventilation rate of 12 air changes per hour.

I. Storage areas shall be separated from sales areas by fire partitions having a fire resistance rating of not less than 1½ hours and when the fire load exceeds that permitted by 402.6.L through 402.6.N, the roof construction shall provide the fire resistance required by Item 11 of Table 505.0.

J. In buildings exceeding 100,000 square feet in area, an approved fire fighting crew shall be organized to assure operation of the emergency ventilation system and shall be on duty at all times when the sales areas are occupied.

402.8 Grade Floor Protection.

A. Non-Fire-Resistive Construction. In all buildings other than Types 1-A and 1-B construction with occupiable stories or basements below grade, the ceilings, partitions, and supports below the grade floor shall be protected with noncombustible materials or assemblies of component materials having a fire resistance rating of not less than ¾ hours or shall be Type 3-A construction, or shall be equipped with automatic sprinklers; but shall be in no case less than the fire resistance rating of the use group and type of construction required by this code.

B. Protected Noncombustile Construction. In all buildings of Type 2-A construction more than 4 stories or 50 feet in height, the floor above the basement or cellar shall be constructed with a fire resistance rating of not less than 2 hours.

C. Basement Assembly Uses. No dance hall, skating rink or similar places of public assembly for amusement, entertainment, instruction,

or service of food or refreshment shall be located in stories or rooms below grade unless the floor construction above and below has a fire resistance rating of not less than 1½ hours.

402.9 Attic Spaces. The attic spaces of all buildings, except where roof and attic are of Types 1-A and 1-B construction, shall be sub-divided into areas not exceeding 3,000 square feet by noncombustible firestops. When doors or other openings are provided in such sub-dividing partition, they shall be of noncombustible materials and the construction shall be tightly fitted around all ducts or other assemblies piercing such partitions.

Sec. 403.0 Height Exceptions.

403.1 Roof Structures. The following appurtenant structures shall not be included in the height of the building: roof tanks and their supports; ventilating, air conditioning and similar building service equipment; roof structures other than penthouses; chimneys and parapet walls not exceeding 4 feet in height; unless the aggregated area exceeds ⅓ of the area of the building upon which they are erected.

403.2 Sprinkler Increase. Except in buildings where automatic sprinkler equipment is required for special uses or occupancies, all structures other than of Type 4 construction, designed for business, industrial, mercantile or low hazard storage uses may be erected one story or 20 feet higher than specified in Table 301.0 when equipped with two source automatic sprinkler system.

Sec. 404.0 Fire Limits.

404.1 Definition. The fire limits shall comprise a section of land including public streets, highways, buildings and structures of all types and uses, the limits of which have been established by law or represent more than 50 percent of the area of a square measured from the center of the proposed construction with diagonals of 2800 feet.

404.2 Determination of Fire Limits. When an owner proposes construction outside of the tabular limits of Table 401.1, or involving the general restrictions of Sec. 405.0, it shall be the responsibility of the owner to present the necessary data to show that the proposed construction location is either inside or outside the fire limits.

404.3 Fire Districts. Where fire districts or fire zones have been established by municipal ordinance, they shall be considered as fire limits.

Sec. 405.0 Restrictions Within Fire Limits.

405.1 High Hazard Uses. All buildings of hazardous use except when approved by the Bureau, shall be prohibited within the fire limits. Paint spray

rooms, drying rooms, and rooms for similar incidental uses, not exceeding 1,000 square feet in area in industrial buildings, shall be permitted when enclosed in fire resistive construction, as specified in Article 8 and when separated by fire divisions, as specified in Table 303.1.

405.2 Protected Exteriors. All buildings of Type 2 construction, except one story buildings not more than 3,000 square feet in area in all use groups except assembly and high hazard, within the fire limits shall be constructed with walls of not less than ¾ hour fire resistance rating when located within 11 feet of interior lot lines or any buildings on the same lot and at least 2 hour fire resistance rating when located within 6 feet.

405.3 Roof Covering Materials. All roof covering materials shall be constructed of Class A, Class B, or Class C roof covering materials complying with Sec. 519.0.

405.4 Frame Construction.

A. Restrictions. No building or structure of Type 4 construction shall be erected within the fire limits or be moved from without to within the fire limits, or from one lot to another within the fire limits, or be extended in height or area within the fire limits except as provided in 405.4.B through 405.4.F.

B. Fences. Fences not over 6 feet in height may be erected of Type 4 construction.

C. Storm Enclosures. Storm enclosures may be erected of Type 4 construction not more than 10 feet in height and not more than 3 feet wider than the entrance doors which they serve.

D. Parking Lot Offices. When located not less than 6 feet from the lot line or any building, parking lot offices not more than 10 feet in height and 100 square feet in area may be erected of Type 4 construction when accessory to a lot for motor vehicle parking.

E. Sheds. Sheds open on the long side not more than 15 feet in height nor more than 500 square feet in area may be erected of Type 4 construction when located not less than 6 feet from lot lines.

F. Builders' Shanties. Temporary builders' shanties erected in connection with approved building operations may be of Type 4 construction for a limited period of time as approved by the Bureau.

405.5 Minor Roof Structures. Aerial supports not more than 12 feet in height, water tanks and flag poles may be erected of wood on buildings not more than 3 stories nor more than 40 feet in height, and drip bars in cooling towers may be constructed of wood not less than one inch thick.

405.6 Bins and Tanks. Coal and material bins, water towers, tank structures, and trestles may be erected of Type 3-A construction, not over 35 feet in height, when located 30 feet from the interior lot lines or from any building, except when located on lot lines along a railroad right of way or waterfront.

405.7 Motor Vehicle Service Stations. Motor vehicle service stations and structures of similar uses not including high hazard uses, may be erected of Type 2-C construction within the height and area limits of Table 401.1, provided they are located not less than 11 feet from the lot line or any building unless the exterior walls are protected as required in 405.2.

405.8 Exterior Trim. Wood cornices and half timbering may be erected on building of mercantile, industrial and business use groups. Existing openings in exterior walls of Types 3-A, 3-B, and 3-C construction which are not required for ventilation or access purposes, may be filled in with wood studs, metal lath, and stucco or other approved construction of equal fire resistance rating.

Sec. 406.0 Restrictions Outside Fire Limits.

406.1 Construction Types Permitted. All types of construction shall be permitted outside the fire limits within the height and area limitations of Table 401.1, except as provided in 406.2 through 406.4.

406.2 Lot Line Separation. The exterior walls of all frame buildings erected less than 6 feet from interior lot lines shall be of at least ¾ hour fire resistive construction, including opening protectives except for store fronts and window openings, but in no case shall such walls be located less than 3 feet from interior lot lines.

406.3 Roof Coverings. All roof covering materials shall be constructed of Class A, B or C roof covering materials complying with Sec. 519.0.

406.4 Special Use and Occupancy. Buildings of special use and occupancy shall be constructed in accordance with Article 7.

Sec. 407.0 Use of Public Property and Encroachments on Legal Open Areas.

407.1 Prohibited Projections. No part of any building or structure shall project beyond the lot line or beyond the building line or over any other legally required open area for light and ventilation or over any other public space, except as provided in 407.2 or 407.3.

407.2 Below Grade. No part of a building erected below grade that is necessary for structural support of the building shall project beyond the lot

lines except that the footings of street walls or their supports located at least 8 feet below grade may project not more than 12 inches beyond the street lot line.

407.3 Above Grade. All encroachments permitted above grade beyond the street lot line or the building line shall be so constructed that their removal will not cause the building to become structurally unsafe.

Sec. 408.0 Permissible Street Encroachments.

408.1 Exceptions. Except as may be otherwise prescribed by law, or by rule of the governmental authorities having jurisdiction over streets, highways, and public spaces, the encroachments covered by 408.2 through 408.9 shall be permitted to project beyond the street lot line or the building line.

408.2 Cornices and Eaves. Main cornices or roof eaves located at least 12 feet above the curb level shall not project more than 3 feet.

408.3 Belt Courses, Lintels, Sills, Architraves and Other Decorations. Belt courses, lintels, sills, architraves, pediments and similar architectural decorations shall not project more than 4 inches when less than 10 feet above the curb level, and not more than 10 inches when 10 feet or more above the curb level.

408.4 Ornamental Columns. Ornamental columns or pilasters including the bases and moldings which emphasize the main entrance of the building shall not project more than 12 inches.

408.5 Entrance Steps. Entrance steps shall not project more than 12 inches and shall be guarded by cheek pieces not less than 3 feet high or shall be located between ornamental columns or pilasters.

408.6 Oriel Windows. Oriel windows with the lowest portion at least 10 feet above the curb level shall not project more than 2½ feet.

408.7 Balconies. Balconies located at least 10 feet above the curb level shall not project more than 3 feet except that when the balcony is required in connection with a fire escape or exterior stairway as a means of egress on existing buildings, the encroachment may be increased, but shall not exceed 4 feet.

408.8 Awnings. Movable awnings with the lowest portion at least 8 feet above the curb level shall not project closer than 12 inches to the curb line. Fixed awnings and marquee located at least 8 feet above the sidewalk shall not project closer than 2 feet to the curb line, but if the lower portion of such marquee or fixed awning is located 13½ feet or more above the sidewalk, it

may project to the vertical plane through the curb. Awning covers or boxes located at least 8 feet above the curb level shall not project more than one foot.

408.9 VAULTS. Vaults below the sidewalk level shall not extend closer than three feet to the curb line.

SEC. 409.0 PERMISSIBLE ALLEY ENCROACHMENTS.

The permissible projections beyond street lot lines as provided in Sec. 408.0 shall apply to building projections into alleyways.

SEC. 410.0 PERMISSIBLE YARD AND COURT ENCROACHMENTS.

410.1 WHEN PERMITTED. No part of any building or structure shall encroach upon side courts, inner courts or yards required for light and ventilation of habitable and occupiable rooms, except as provided in 410.2 through 410.7. In no case shall the encroachment exceed 20 percent of the legal area of yard or court required for light and ventilation purposes.

410.2 ROOF EAVES. Roof eaves shall not project more than 3 feet into a required yard or court.

410.3 ARCHITECTURAL FEATURES. Belt courses, window sills and similar architectural features shall not project more than one foot into a required yard or court.

410.4 EXTERIOR STAIRS AND FIRE ESCAPES. Exterior stairs, fire tower balconies, fire escapes, or other required means of egress shall not project more than 4 feet into a required yard or court.

410.5 CHIMNEYS. Chimneys shall not project more than 2 feet into required yard or court.

410.6 STEPS. Steps shall not project more than one foot into a required yard or court.

410.7 RAIN LEADERS. Rain leaders shall not project more than one foot into a required yard or court.

ARTICLE 5

FIRE PROTECTION CONSTRUCTION REQUIREMENTS

SEC. 500.0 SCOPE.

This Article of the code shall apply to fire safety and required fire resistance and flame resistance as determined by the potential fire hazard to and from the building and by the use and occupancy of the building or structure.

SEC. 501.0 MATERIALS OF CONSTRUCTION.

501.1 FIRE RESISTANCE RATING. All building elements and built-up assemblies of structural materials including walls, partitions, columns, girders, beams and slabs shall be rated in accordance with performance under the standard fire test procedures for full-size specimens in accordance with accepted engineering practice.

501..2 LISTED MATERIALS AND DEVICES.

A. In place of the test procedures prescribed in this code for building elements, built-up assemblies of structural material, fire doors, fire windows, fire retardant wood and other trim, finish and decorative materials, the Bureau may accept such materials and assemblies that are listed by a nationally recognized testing agency, as provided in accepted engineering practice.

B. In lieu of 501.2, the Bureau may accept the certification of the architect or engineer of record that such elements, assemblies or equipment provide equivalent protection.

501.3 USE OF COMBUSTIBLE MATERIAL IN FIRE RESISTIVE ASSEMBLIES.

A. Acceptable Material. All materials and forms of construction that develop the fire resistance required by this code shall be acceptable for fire proofing and structural purposes except that the use of combustible component materials in structural units or structural assemblies in buildings of Type 1 or 2 construction shall be limited as provided in 501.3.B through 501.3.D.

B. Combustible Components. Combustible aggregates may be incorporated in concrete mixtures approved for fire resistive construction. Other approved component materials or admixtures that meet the fire resistance test requirements of this code may be used in structural

assemblies. Wood nailing strips or any other material of similar combustible characteristics for securing trim and finish may be embedded in concrete and masonry construction.

C. Filler Units. When not included in strength calculations, filler units that contain component combustible materials may be used in fire resistive floor constructions provided the complete assembly meets the required fire resistance rating.

D. Fire Retardant Lumber. Fire retardant treated lumber may be used as follows:

(1) For interior non-bearing partitions not required to have a fire resistance rating. Where a fire resistive rating is required, the fire retardant treated wood shall be limited to the framing members, such as studs, plates and blocking.

(2) For roof framing and roof decks in one story buildings not required to have a fire resistance rating or where the fire resistance rating does not exceed ¾ hours.

(3) For interior furring and blocking of exterior walls, furring and blocking of interior walls and partitions, and framing of suspended ceilings, provided the furring, blocking and framing do not affect the integrity or reduce the fire resistance rating of the construction element.

(4) For interior finish and trim when flame spread rating of the fire retardant lumber complies with Table 504.3.

(5) As provided in 504.5.B.

501.4 Light-Transmitting Plastic Construction.

A. Light-transmitting plastics, which meet the strength, durability and sanitary requirements of this code shall comply with 501.4.A.1 and 501.4.A.2.

(1) The light-transmitting plastic shall burn no faster than 2½ inches per minute in sheets 60/1000 of an inch in thickness when tested in accordance with accepted engineering practice.

(2) The light-transmitting plastic shall have a smoke density rating of:

a. 75 or less when tested in accordance with accepted engineering practice, or

b. No greater than 450 when tested in a way intended for use in accordance with accepted engineering practice.

B. Light-transmitting plastics shall be classified in accordance with the following when tested in sheets 60/1000 of an inch in thickness in accordance with accepted engineering practice.

(1) Class SE—Plastic materials which are self-extinguishing.

(2) Class VSB—Plastic materials which have a burning rate of 0.8 inches per minute or less.

(3) Class SB—Plastic materials which have a burning rate of 2½ inches per minute or less.

Sec. 502.0 Protection of Structural Members.

502.1 Full Member Protection. All structural elements shall have the fire resistance required by Table 505.0.

502.2 Floor Support. Columns, girders, trusses, beams or supporting floors shall be provided with fire protection at least equivalent to that required by Table 505.0 for the floor construction.

502.3 Embedded Mechanical Facilities. Pipes, wires, conduits, ducts, or other service facilities shall not be embedded in the required fire protection of a structural member, except that pipes, wires and conduits may be installed between the required fire protection and the structural member protected, provided that where they pierce the required fire protection, the area of the penetrations by pipes, sleeves, electrical outlet boxes, or other voids, do not exceed two percent of the area of the fire protection on any one face, and that the voids in the fire protection are closed off with close fitting metal escutcheons or plates. The concealed spaces shall be firestopped at each story as required by Sec. 515.0.

502.4 Protection from Damage. Where the fire protective covering on a column is subject to physical damage from moving vehicles, handling of merchandise, or by other means the fire protective covering shall be protected by a substantial jacket of metal, other noncombustible material or by corner guards.

502.5 Exterior Exposed Structural Members. Exterior columns, girders, or beams of buildings which do not exceed two stories or 30 feet in height, which are required by Table 505.0 to have a fire resistance rating not exceeding one hour need not be protected from exterior fire exposure when the building has an exterior separation of 30 feet or more and the open space is not used for storage, parking, or as a loading dock.

Sec. 503.0 Flame Resistance of Building Material.

503.1 Flame Spread. The flame resistance and combustibility of materials used in construction such as for finish, trim or decoration shall be determined by the flame-spread test procedures provided in accepted engineering practice.

503.2 Classification. Materials subjected to flame spread test shall be classified by the average of at least three surface flame spread ratings according to Table 503.2.

Table 503.2

Class	Average Flame Spread Rating
I	0–25
II	26–75
III	76–225
IV	Over 225

503.3 Surface Coverings. Materials used as coverings such as paint, paper or similar substances which are less than one twenty-eight (0.036) inch total thickness may be accepted without modification of the flame spread rating when they do not contribute to the flame spread, smoke density or toxicity more than paper of similar thickness when each is cemented or adhered to solid backing.

Sec. 504.0 Interior Finish.

504.1 Defined. Interior finish shall include the exposed surface material or other finish applied to walls and partitions of fixed or movable type, ceilings and other interior surfaces. Decorations or furnishings not so applied, doors, finished floors, heavy timber structural members or floor coverings shall not be considered as interior finish.

504.2 Trim. Trim, picture molds, chair rails, baseboards, handrails and window frames, door bucks and their casings shall be construed as trim and not interior finish. Trim when not in enclosed vertical exits or in rooms or spaces required to have fire protected openings may have a flame spread rating one class less flammable than that required for the interior finish but not less than Class III when the area of the trim is not in excess of 20 percent of the aggregate wall and ceiling area.

504.3 Flame Spread. Interior finish materials shall have a flame spread rating not greater than that designated by Table 504.3.

Table 504.3

Flame Spread of Interior Finishes

Class	Group Use	Flame Spread Classification: Required Vertical Exits and Exit Passageways	Flame Spread Classification: Corridors Providing Access to Exits	Flame Spread Classification: Rooms or Enclosed Spaces(1)
A	High Hazard	I	II	III
B-1	Storage—Moderate Hazard	I	II	III
B-2	Storage—Low Hazard	I	II	III
C	Mercantile	I	II	III
D	Industrial	I	II	III
E	Business	I	II	III
F-1	Assembly—Theaters	I	I	II(2)
F-2	Assembly—Night Clubs	I	I	II(2)
F-3	Assembly—Halls, Terminals, Restaurants	I	II(3)	III
F-4	Assembly—Churches	I	II(3)	III

Notes to Table

1. The specific use or occupancy of the room or enclosed space shall be the governing factor, regardless of the occupancy group classification of the building or structure. When approved full sprinkler protection is provided, interior finish of Class II or III materials may be used in place of Class I or II materials, respectively, except in exits or exit passageways.
2. Class III interior finish materials may be used in enclosed spaces for wainscoting not more than 8 feet in height and not more than 2,000 square feet in applied surface areas. Such interior finish shall be applied over a non-combustible backing.
3. Class III interior finish materials may be used in one story buildings or for ceilings which are 20 feet or more in height to the lowest part of the ceiling construction in multi-story buildings.
4. Class III interior finish may be used in administrative areas.

504.4 Application of Interior Finishes.

A. Interior finish materials shall be applied or otherwise fastened in such a manner that they will not readily become detached when subjected to room temperatures of 200 degrees F or less for 30 minutes or otherwise become loose through changes in the setting medium from the effects of time or conditions or occupancy.

B. Interior finish materials applied to walls, ceilings or structural elements of a building or structure which are required to be fire-resistive or to be constructed of noncombustible component materials, shall be applied directly against the exposed surface of such structural elements, or to furring strips attached to such surfaces with all concealed spaces created thereby firestopped where in excess of 10 square feet in area or 8 feet in any dimension.

C. Where walls, ceilings or other structural elements are required to be fire-resistive or to be constructed of noncombustible component materials and interior finish is set out or dropped distances greater than 1¾ inches from the surface of such elements, only materials of which both faces qualify as Class I shall be used, unless the finish material is protected on both sides by automatic sprinklers or is attached to a noncombustible backing complying with 504.4.F or to furring strips applied directly to such backing as provided in 504.4.B.

D. Interior finish materials may be applied directly to the wood members and decking of heavy timber construction, where permitted, or to furring strips applied to such members or wood decking as provided in 504.4.B.

E. Interior finish materials, other than Class I material, which are less than ¼ inch in thickness shall be applied directly against a noncombustible backing unless the tests under which such material has been classified were made with the materials suspended from the noncombustible backing.

F. Noncombustible backing for interior finish materials shall be a continuous surface with permanently tight joints, equal in area to the area of the finish, and extending completely behind such finish in all directions; and may be of any materials meeting requirements for noncombustible classification of material or of fire-retardant treated lumber. When the noncombustible backing does not constitute an integral part of the structural elements or system, it shall be attached directly to the structural elements or to furring strips as required for the application of finish according to 504.4.B or may be suspended from the structural members at any distance provided concealed spaces created thereby shall be fire stopped in accordance with the applicable requirements. Where Class III interior finish is applied to a continuous noncombustible backing beneath wood joist construction, the allowable area for fire stopping may be increased to 3,000 square feet.

504.5 Fire Retardant Lumber.

A. Fire retardant lumber used as interior finish shall have a flame spread rating not exceeding that permitted by Table 504.3.

B. Fire retardant treated wood may not be used where exposed directly to the weather or in interior spaces where it will be subjected to wetting or humidity conditions which could cause leaching, unless listed for such use. After treatment, the material may be cut to length and may be bored or cut for plumbing or heating pipes and for electrical outlets. There shall be no other fabrication after treatment, such as shaping or grooving for splines or connectors so as to expose untreated surfaces unless the exposed surfaces or edges are tightly butted against other material that is noncombustible or that is fire retardant treated wood. The allowable working stresses shall be 90 percent of the allowable stresses for untreated lumber of like condition.

504.6 Decorative Material.

A. In place of public assembly and in exits of buildings, all draperies, hangings, and other decorative materials suspended from walls or ceilings shall be noncombustible or flame resistant, complying with accepted engineering practice.

B. The permissible amount of noncombustible decorative hangings shall not be limited.

C. The permissible amount of flame resistant decorative hangings shall not exceed 20 percent of the total wall and ceiling area in any room or space.

Sec. 505.0 Required Fire Resistance of Structural Elements.

The fire resistance rating of structural and other building elements for all types of construction shall comply with Table 505.0.

Table 505.0

Fire-Resistance Ratings of Structural Elements in Hours

ITEM	STRUCTURAL ELEMENT		TYPE OF CONSTRUCTION									
			TYPE 1		TYPE 2			TYPE 3			TYPE 4	
					NONCOMBUSTIBLE			EXTERIOR MASONRY WALLS			FRAME	
			FIRE-RESISTIVE		Protected		Unprot.	Heavy Timber (Mill)	Ordinary		Protected	Unpr
									Protected	Unprot.		
			1A	1B	2A	2B	2C	3A	3B	3C	4A	4
1	Exterior Walls											
	On street lot lines or with fire separation of 30' or more from interior lot lines or any bldg.	Bearing	4	3	2	3/4	0	2	2	2	3/4	C
		Non-bearing (1)	0	0	0	0	0	0	0	0	3/4	C
	On interior lot lines or less than 6' therefrom or within 11' of any building	Bearing	4	3	2	2	2 (2)	2	2	2	3/4	3/
		Non-bearing	2	2	1-1/2	3/4	2 (2)	2	2	2	3/4	3/
	6' or more but less than 11' from interior lot lines, or from 11'to 20' of any building	Bearing	4	3	2	3/4	3/4 (2)	2	2	2	3/4	0
		Non-bearing	2	2	1-1/2	3/4	3/4 (2)	2	2	2	3/4	0
	11' or more but less than 30' from interior lot lines, or from 20' to 30' of any building	Bearing	4	3	2	3/4	0	2	2	2	3/4	0
		Non-bearing	1-1/2	1-1/2	3/4	3/4	0	1-1/2	1-1/2	1-1/2	3/4	0
2	Interior Bearing Walls and Partitions		4	3	2	3/4	0	2	3/4	0	3/4	0
			← (11) →									
3	Fire Walls or Party Walls (3)		4	3	2	2	2	2	2	2	2	2
4	Fire Divisions		← (4) →									
5	*Fire Enclosure of Exit Passageways, Stairways, Elevator Hoistways and other Shafts (5)*		2	2	2	2	2	2	2	2	3/4	3/4
			← (11) →									
6	Corridor Partitions and Vertical Separation of Tenant Spaces (6)		3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	1/2	1/2
			← (11) →									
7	Other Non-bearing Partitions (7)		← (11) →					0	0	0	0	0
8	Columns, Girders, Trusses (other than Roof Trusses) and Framing	Supporting one floor or roof	3	2	1-1/2	3/4	0	3/4	3/4	0	1/2	0
			← (11) →									
		Supporting more than one floor	4	3	2	3/4	0	3/4	3/4	0	1/2	0
			← (11) →									
9	Structural Members Supporting Wall or Floors		← (8) →									
10	Floor Construction including Beams		3	2	1-1/2	3/4	0	(9)	3/4	0	1/2	0
			← (11) →									
11	Roof Framing and Deck 15' or less in height (10)		2	1-1/2	3/4	3/4	0	(9)	3/4	0	1/2	0
			← (11) →									
12	Roof Framing and Deck (10)	A More than 15' but less than 20' in hgt. to lowest member	3/4	3/4	3/4	0	0	(9)	0	0	1/2	0
			← (11) →									
		B 20' or more in height to lowest member	0	0	0	0	0	(9)	0	0	0	0
			← (11) →									

Notes to Table

1. One-story buildings less than 50,000 square feet in floor area may have zero fire-resistance rating. One-story buildings more than 50,000 square feet in floor area may have zero fire-resistance rating, when the fire separation is 80 feet or more.
2. One-story buildings of Type 2-C construction not over 3,000 square feet in area of all use groups, except assembly and high hazard, shall be exempt from the requirements for protected exteriors.
3. In no case less than the fire grading of the use group, see Sec. 303.0.
4. Fire-resistance rating shall correspond to fire grading of use group, see Sec. 303.0.
5. For modifications pertaining to stair enclosures, see Sec. 612.9; for pipe shafts and shaft enclosures, see Sec. 511.0.
6. See Sec. 608.6.
7. See Sec. 510.2.
8. The required fire-resistance of wall or floor supported but not less than the fire-resistance rating for the type of construction.
9. See Sec. 302.4.A.
10. For clearance from combustible contents, see Sec. 513.2.
11. Noncombustible construction only.

Table 505.0

Fire-Resistance Ratings of Structural Elements in Hours

ITEM	STRUCTURAL ELEMENT		TYPE OF CONSTRUCTION									
			TYPE 1		TYPE 2			TYPE 3			TYPE 4	
					NONCOMBUSTIBLE			EXTERIOR MASONRY WALLS			FRAME	
			FIRE-RESISTIVE		Protected		Unprot.	Heavy Timber (Mill)	Ordinary		Protected	Unprot.
									Protected	Unprot.		
			1A	1B	2A	2B	2C	3A	3B	3C	4A	4B
1	Exterior Walls											
	On street lot lines or with fire separation of 30' or more from interior lot lines or any bldg.	Bearing	4	3	2	3/4	0	2	2	2	3/4	0
		Non-bearing (1)	0	0	0	0	0	0	0	0	3/4	0
	On interior lot lines or less than 6' therefrom or within 11' of any building	Bearing	4	3	2	2	2 (2)	2	2	2	3/4	3/4
		Non-bearing	2	2	1-1/2	3/4	2 (2)	2	2	2	3/4	3/4
	6' or more but less than 11' from interior lot lines, or from 11'to 20' of any building	Bearing	4	3	2	3/4	3/4 (2)	2	2	2	3/4	0
		Non-bearing	2	2	1-1/2	3/4	3/4 (2)	2	2	2	3/4	0
	11' or more but less than 30' from interior lot lines, or from 20' to 30' of any building	Bearing	4	3	2	3/4	0	2	2	2	3/4	0
		Non-bearing	1-1/2	1-1/2	3/4	3/4	0	1-1/2	1-1/2	1-1/2	3/4	0
2	Interior Bearing Walls and Partitions		4	3	2	3/4	0	2	3/4	0	3/4	0
			← (11) →									
3	Fire Walls or Party Walls (3)		4	3	2	2	2	2	2	2	2	2
4	Fire Divisions		← (4) →									
5	Fire Enclosure of Exit Passageways, Stairways, Elevator Hoistways and other Shafts (5)		2	2	2	2	2	2	2	2	3/4	3/4
			← (11) →									
6	Corridor Partitions and Vertical Separation of Tenant Spaces (6)		3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	1/2	1/2
			← (11) →									
7	Other Non-bearing Partitions (7)		← (11) →					0	0	0	0	0
8	Columns, Girders, Trusses (other than Roof Trusses) and Framing	Supporting one floor or roof	3	2	1-1/2	3/4	0	3/4	3/4	0	1/2	0
			← (11) →									
		Supporting more than one floor	4	3	2	3/4	0	3/4	3/4	0	1/2	0
			← (11) →									
9	Structural Members Supporting Wall or Floors		← (8) →									
10	Floor Construction including Beams		3	2	1-1/2	3/4	0	(9)	3/4	0	1/2	0
			← (11) →									
11	Roof Framing and Deck 15' or less in height (10)		2	1-1/2	3/4	3/4	0	(9)	3/4	0	1/2	0
			← (11) →									
12	Roof Framing and Deck (10)	A More than 15' but less than 20' in hgt. to lowest member	3/4	3/4	3/4	0	0	(9)	0	0	1/2	0
			← (11) →									
		B 20' or more in height to lowest member	0	0	0	0	0	(9)	0	0	0	0
			← (11) →									

Notes to Table

1. One-story buildings less than 50,000 square feet in floor area may have zero fire-resistance rating. One-story buildings more than 50,000 square feet in floor area may have zero fire-resistance rating, when the fire separation is 80 feet or more.
2. One-story buildings of Type 2-C construction not over 3,000 square feet in area of all use groups, except assembly and high hazard, shall be exempt from the requirements for protected exteriors.
3. In no case less than the fire grading of the use group, see Sec. 303.0.
4. Fire-resistance rating shall correspond to fire grading of use group, see Sec. 303.0.
5. For modifications pertaining to stair enclosures, see Sec. 612.9; for pipe shafts and shaft enclosures, see Sec. 511.0.
6. See Sec. 608.6.
7. See Sec. 510.2.
8. The required fire-resistance of wall or floor supported but not less than the fire-resistance rating for the type of construction.
9. See Sec. 302.4.A.
10. For clearance from combustible contents, see Sec. 513.2.
11. Noncombustible construction only.

Sec. 506.0 Exterior Walls.

506.1 Omission of Enclosure Walls. When the enclosure walls for all or part of a story are omitted, the open areas shall be separated from the upper and lower stories of the building by wall and floor construction complying with Table 505.0. The piers, columns and other structural supports within the open portion shall be constructed with the fire resistance required for exterior walls, but not less than the fire grading of the use group of Table 303.1.

506.2 Permitted Window Area in Fire-Resistive Exterior Walls. The maximum allowable area of window to required fire-resistive bearing or non-bearing exterior wall area in any story except the first story facing a street or public space shall comply with Table 506.2.

Table 506.2

Horizontal Separation Feet	Bearing Wall Percent of Area	Non-Bearing Wall Percent of Area
0 to 3	0	0
Over 3 to 11	20	30
Over 11 to 30	30	40
Over 30	40	No Limit

506.3 Wall Lintels. Lintels over openings in walls shall have a fire resistance rating not less than required by this Section for the wall in which the lintel is placed; however, no fire resistance rating shall be required when the opening is spanned by a masonry arch designed to carry all imposed loads or the opening is spanned by a beam above the lintel which has a fire resistance rating not less than required by this Section for the wall in which the beam is placed, or the span does not exceed 4 feet. Stone lintels shall not be used unless supplemented with steel lintels, reinforced concrete or masonry arches designed to support the imposed loads.

506.4 Combustible Trim. In buildings of Type 3 construction that do not exceed three stories or 40 feet in height, exterior half-timbering and similar architectural decorations may be constructed of wood or other combustible materials, provided such trim is backed up solidly with approved noncombustible materials.

506.5 Balconies and Bay Windows. All balconies, bay and oriel windows attached to or supported by exterior walls of other than Type 4 construction shall be built of noncombustible material.

506.6 Existing Combustible Construction. Any existing cornice or other exterior architectural element constructed of combustible materials may be repaired with the same material to the extent of 50 percent of its area in one year if public safety is not thereby endangered.

506.7 Plastic Exterior Wall Panels.

A. Approved plastic materials may be used as wall panels, in exterior walls not required to have a fire-resistive rating, except in hazardous use groups and assembly-theaters and nightclub use groups.

B. Area limitation and separation requirements of exterior wall panels shall be as provided in Table 506.7.B.

C. Vertical spandrel wall separation between stories shall be three feet for SE and VSB plastic wall panels and four feet for SB plastic wall panels.

D. Combinations of plastic glazing and plastic wall panels shall be subject to the area, height, percentage limitations and separation requirements applicable to the class of plastics as prescribed for wall panel installations.

Sec. 507.0 Protection of Openings.

507.1 When Required. In all buildings, other than churches and open air parking structures, exterior openings shall have approved fire windows, fire shutters, water curtains, fire doors or other approved protective assemblies having a fire resistance rating of not less than ¾ hours as follows:

A. Exposures on Street or Open Space. Opening protectives shall be required in walls of buildings facing streets or public spaces less than 20 feet wide.

B. Exposures on Interior Lot Line. Opening protectives shall be required in walls of buildings within 11 feet of interior lot lines.

C. Exposure on the Same Site. Approved protectives shall be provided in every opening of buildings or building sections located on the same site, within 20 feet horizontally in a direct line of any structure of Type 2-C or 4-B construction or within 30 feet horizontally of any unprotected opening in another building or building section regardless of type of construction.

D. Vertical Exposure on the Same Site. Approved protectives shall be provided in every opening which is less than 30 feet vertically above the roof of a building or building section on the same site within a

Table 506.7.B

Fire Separation	Class of Plastic (3)	Max. Area of Exterior Wall in Plastic Panels	Maximum Single Area	Minimum Separation of Panels	
				Vertical	Horizontal
		Percent	Square Feet	Feet	Feet
6 ft. or less	—	(2)	(2)	—	—
More than 6 ft. but less than 11 ft.	SE	10	50	8	4
	VSB, SB	(2)	(2)	—	—
11 ft. or more but less than 30 ft.	SE	25	90	6	4
	VSB, SB	15	70	8	4
30 ft. and over	SE, VSB	50	Not Limited	3	0
	SB	50	100	6	3

Notes to Table

1. See 506.7.D for combination of glazing and wall panel areas permitted.
2. Not permitted.
3. See 501.4.B for plastic classification.

horizontal distance of 30 feet of the wall in which the opening is located, unless such roof construction has a fire resistance rating of not less than one hour.

507.2 Installation. Opening protectives shall be installed in accordance with accepted engineering practice.

507.3 Spandrel Walls. In all buildings and structures designed for storage, mercantile, industrial and business uses exceeding three stories or 40 feet in height; openings located vertically above one another in exterior walls which are required to have a fire resistance rating of more than ¾ hours, shall be separated by spandrel walls not less than three feet in height extending between the top of any opening and the bottom of the opening next above and having a fire resistance rating not less than that of the exterior wall or by a fire canopy as provided in 507.4.

507.4 Fire Canopy. A fire canopy may be used in lieu of spandrel wall. It shall project at least two feet horizontally out from the wall and be at least as long as the width of the opening below. It shall have the same fire resistance rating as required for the exterior wall.

507.5 Fire Access Openings. Buildings over 20 feet high without openings within 100 feet of each other in exterior walls facing on street or other accessible space shall be provided with fire access panels in each one story building exceeding 20 feet in height and in each story of multi-story buildings above the first but not higher than 75 feet above grade. Fire access panels shall be openable from the inside and the outside, shall be not less than 32 inches wide and 48 inches high, and shall be spaced not more than 100 feet apart and when serving a story or stair with a sill height of not more than 36 inches above the floor or stair landing as the case may be. Smoke and heat vents which provide access through exterior walls or the roof may be used in lieu of fire access openings when they provide equivalent access.

507.6 Glazing of Unprotected Openings.

A. Doors, sash and framed openings, which are not required to be fire protected, may be glazed with approved plastic or other materials in buildings of any construction.

B. The area of such glazing shall not exceed 25 percent of the wall face of the story in which it is installed.

C. The area of a unit or pane of glazing installed above the first story shall not exceed 12 square feet and the vertical dimensions of a unit or pane shall not exceed 4 feet. There shall be a minimum 3 feet vertical spandrel wall between stories.

Sec. 508.0 Fire Walls and Party Walls.

508.1 Fire Resistance Rating. Fire walls and party walls shall be constructed of approved noncombustible material to provide the fire resistance rating specified in Table 505.0 for the type of construction, but not less than the fire grading of the use group specified in Table 303.1. The construction shall comply with all the structural provisions for bearing or non-bearing walls.

508.2 Fire Wall Offset. If fire walls are offset at intermediate floor levels in fire protected skeleton frame construction, the offset floor construction and the intermediate wall supports shall be constructed of noncombustible material with a fire resistance rating not less than that required for the fire wall.

508.3 Fire Wall Continuity. In all buildings and structures of other than Types 1-A and 1-B construction, fire walls and party walls shall be continuous from foundation to 2 feet 8 inches above the top of the roof framing if thoroughly firestopped and no combustible materials extend through the wall.

508.4 Cutting Fire Walls. No fire wall, 8 inches or less in thickness, shall be cut for chases or socketed for insertion of structural members subsequent to erection.

508.5 Hollow Fire Walls. When combustible members frame into hollow fire walls or fire walls of hollow units, all hollow spaces around and between the structural members shall be firestopped, in accordance with Sec. 515.0.

508.6 Fire Cutting of Wood Joists. Where intermediate wood floor joists bear on masonry fire and bearing walls, each joist end shall be tapered or fire cut before erection.

508.7 Combustible Insulation. Combustible insulation may be permitted when cemented or attached directly to the face of the fire wall and protected on the exposed surface with a noncombustible material without intervening air spaces.

508.8 Fire Wall Openings.

A. No opening shall exceed 120 square feet except as provided in 508.8.B.

B. In one story buildings where the entire area on both sides of the fire wall is sprinklered, the opening may be not more than 240 square feet when the opening is protected by approved water spray protection.

C. The aggregate width of all openings in a fire wall at any floor level shall not exceed 25 percent of its length.

D. Openings in fire walls shall be protected with approved opening protectives having a combined fire protection rating complying with Sec. 514.0 and when serving as a horizontal exit in fire walls.

Sec. 509.0 Fire Partitions.

509.1 Fire Resistance Rating. Fire partitions required for the enclosure of exits and areas of refuge shall be constructed of approved materials having at least the fire resistance rating prescribed by Item 5 of Table 505.0.

509.2 Fire Partition Continuity. When fire partitions around vertical shafts are not continuous from floor to floor, the offset in the floor construction shall be of construction having a fire resistance rating not less than that of the partition construction.

509.3 Openings. No openings other than exit doors shall be permitted in fire partitions except as provided in 608.7. Doors in fire partitions shall comply with Sec. 514.0 except as modified by 610.9.A and 610.9.B, when they provide access to corridors.

509.4 Horizontal Exits in Fire Partitions. A self-closing swinging fire door assembly rated in accordance with 514.2.A shall be provided in horizontal exits in fire partitions. Each such door shall swing in the direction of exit flow from that side and when serving as an exit in both directions adjacent doors shall be provided each swinging in opposite directions.

509.5 Combustible Stair Enclosures. Stair enclosures constructed of approved combustible assemblies protected with component materials to afford the required fire resistance ratings shall be continuous through combustible floor construction and shall provide an unbroken fire barrier in combination with protected floors, ceilings, and fire doors separating the exit from the unprotected areas of the building. Such enclosures shall be firestopped to comply with Sec. 515.0.

Sec. 510.0 Fire Resistive Partitions.

510.1 Combustible Construction. In buildings and structures of Types 3 or 4 construction, wood studs or other combustible assemblies may be used when they afford the fire resistance specified in Table 505.0 or Article 8.

510.2 Noncombustible Construction. In all buildings and structures of Types 1 or 2 construction, partitions shall be approved noncombustible material, approved fire retardant treated lumber, or shall have a fire resistance rating of not less than one hour except that trim may be of wood.

510.3 SUPPORTS. Floors supporting fire resistive partitions shall provide at least equivalent fire resistance. All fire resistive partitions shall extend from the top of the fire resistive floor below to the fire resistive ceiling or floor above, and shall be securely attached thereto. All hollow vertical spaces in partitions shall be firestopped at every floor level as required in Sec. 515.0.

SEC. 511.0 VERTICAL SHAFTS AND HOISTWAYS.

511.1 APPLICATION. Sec. 511.0 shall apply to all shaft enclosures except as specifically modified for stair enclosures, flue enclosures and incinerator chutes.

511.2 OPEN SHAFT ENCLOSURES. The enclosing walls of shafts that are open to the outer air at top shall be constructed of materials suitable for exterior walls of buildings and structures and provide the required fire resistance specified in Table 505.0 for shafts.

511.3 SHAFT ENCLOSURES. The enclosing walls and the top of shafts extending through more than 2 stories shall be constructed of noncombustible materials having a fire resistance rating of not less than 2 hours, and when extending through a non-fire resistive roof shall have an 18 inch minimum parapet. Except in high hazard occupancy, shaft enclosures not extending more than two stories or more than 25 feet shall be constructed of noncombustible materials having a fire resistance rating of not less than ¾ hours and not less than that of the floor penetrated.

511.4 VENTING OF SHAFTS. All shafts exceeding 4 square feet in area that extend more than two stories or 25 feet shall be provided with approved venting device, complying with Sec. 517.0. Where such shafts do not extend to the roof, the enclosing duct extending to the exterior shall have the same fire resistance as the shaft enclosure.

511.5 NOT EXTENDING TO ROOF. A shaft that does not extend into the top story of the building shall be enclosed with top construction of the same fire resistance as the floors of the building or structure in which it occurs, but in no case less than that of the fire resistance rating of the shaft enclosure in Table 505.0.

511.6 BOTTOM ENCLOSURE. All shafts that do not extend to the bottom of the building or structure shall be enclosed at the lowest level with construction of the same strength and fire resistance as the lowest floor through which it passes, but in no case with a fire resistance rating less than that of the shaft enclosure.

511.7 EXISTING SHAFTWAYS. In all existing shaftways of buildings which are not already enclosed as required in this code, the Bureau shall direct such construction as it may deem necessary to insure the safety of the occupants.

511.8 OPENING PROTECTIVES FOR SHAFTS. Shafts and hoistways shall have approved opening protectives complying with Sec. 507.0.

511.9 DUCT AND PIPE SHAFTS. Vertical ducts or pipes arranged in groups of two or more which extend through two or more stories and occupy an area of more than one square foot but less than 4 square feet shall be enclosed in construction of not less than ¾ hour fire resistance rating. Such required enclosures with area exceeding 4 square feet shall conform to 511.4.

511.10 UNENCLOSED ESCALATORS. Unenclosed vertical openings for escalators which are not accepted as required means of egress shall be permitted in sprinklered buildings when the opening is provided with one of the methods of protection in 511.10.A through 511.10.D.

A. Sprinkler Vent Method. An approved combination of an automatic fire or smoke detection system, automatic air control system and an automatic water curtain.

   (1) An air control system shall be so located and of such capacity as to create a downdraft through the moving stairway floor opening having an average velocity of not less than 300 feet per minute under normal conditions for a period of not less than 30 minutes. The operation of the exhaust system for any floor opening shall be initiated by an approved device in the story involved. There shall also be provided a manual means of operating and testing the system at periodic intervals.

   (2) A water curtain shall be formed by open sprinklers or spray nozzles so located and spaced as to form a complete and continuous barrier along all exposed sides of the floor opening and reaching from the ceiling to the floor. Water intensity for the water curtain shall be not less than 3 gallons per minute per lineal foot of water curtain measured horizontally around the opening. The water curtain shall operate automatically from a fixed temperature type device so placed with respect to the floor opening that the water curtain operates upon the advance of heat towards the moving stairway opening.

B. The Rolling Shutter Method. An approved automatic self-closing rolling shutter which will completely enclose the top of each moving stairway.

   (1) The shutter shall not be used to protect floor openings for moving stairways communicating directly with basements. Where used to protect floor openings the operation of the shutter shall be initiated by an automatic fire or smoke detection system

located near the moving stairway. There shall be a manual means of operating and testing the operation of the shutter.

(2) The shutter assembly shall be capable of supporting 200 pounds applied on any one square foot of area and shall be not less resistant to fire than 24 gauge steel. The shutter shall operate at a speed of not greater than 30 feet per minute and shall be equipped with a sensitive leading edge. The leading edge shall arrest the progress of the moving shutter and cause it to retract a distance of approximately 6 inches upon the application of a force not in excess of 20 pounds applied on the surface of the leading edge. The shutter, following retraction, shall continue to close immediately.

C. The Spray Nozzle Method. An approved combination of an automatic fire or smoke detection system and a system of high velocity water spray nozzles.

(1) The number of spray nozzles, their discharge angles and their location shall be such that the moving stairway opening between the top of the wellway housing and the treadway will be completely filled with dense spray on operation of the system. Spray nozzles shall be of the open type and shall have a solid conical spray pattern with discharge angles between 45 and 90 degrees. The number and size of nozzles and water supply shall be sufficient to deliver a discharge of 2 gallons of water per square foot per minute through the wellway, area to be figured perpendicular to the slope of the moving stairway.

(2) Spray nozzles shall be so located and positioned that the center line of the spray discharge is as closely as possible in line with the slope of the moving stairway; at not more than an angle of 30 degrees with the top slope of the wellway housing. Nozzles shall be positioned, also, so that the center line of discharge is at an angle of not more than 30 degrees from the vertical sides of the wellway housing.

(3) The spray nozzles shall discharge at a pressure of not less than 25 pounds per square inch. Water supply piping may be taken from the sprinkler system provided in so doing an adequate supply of water will be available for the spray nozzles and the water pressure at the sprinkler furthest from the supply riser is not reduced to a point below that required for the sprinklers. Control valves for the water supply to spray nozzles shall be so located as to be readily accessible.

(4) The spray nozzle system shall operate automatically from thermal response elements of the fixed temperature type so placed with respect to the floor opening that the spray nozzle system operates upon the advance of heat towards the moving stairway opening. The system shall also be provided with manual means of operation.

(5) A noncombustible draft curtain shall be provided extending at least 20 inches below and around the opening and a solid noncombustible wellway housing at least 5 feet long measured parallel to the handrail, and extending from the top of the handrail enclosure to the soffit of the stairway or ceiling above, at each moving stairway floor opening. Where necessary, spray nozzles shall be protected against mechanical damage.

D. The Kiosk Method. A noncombustible enclosure at the upper floor landings equipped with an approved double acting self-closing door or doors of metal and wired glass.

(1) Wired glass in metal framework may be used for the enclosure provided no light of glass has a length or width greater than 48 inches.

(2) The enclosure shall include a landing at each floor which is of sufficient length beyond the moving stairway to permit the full opening of the door or doors beyond the handrail and having a width not less than that of the floor opening.

SEC. 512.0 CEILINGS.

512.1 FIRE RESISTIVE CEILINGS.

A. When a ceiling is used to fire protect a noncombustible floor or roof assembly, it shall be continuous between exterior walls, fire walls or fire partitions having at least the same fire resistance rating as the ceiling.

B. Fire resistive ceilings which constitute an essential part of a floor or roof assembly to meet a required fire resistance rating shall be installed as tested and may have openings to accommodate noncombustible piping, ducts, lighting fixtures and other electric outlets. The aggregate area of such openings in the ceiling shall be not greater than the area of openings in the test assembly which determined the fire resistance rating and the fixtures and attachments shall be installed so as not to decrease the fire resistance of the assembly. All

duct openings shall be protected with approved noncombustible fire dampers, except where dampers are not provided in the tested ceiling assemblies.

512.2 Non-Fire Resistive Ceilings. Where a floor or roof has the fire resistance rating required by Table 505.0, a ceiling having no fire resistance rating may be suspended below it. In buildings of Types 1 and 2 construction, the hangers and framing shall be of noncombustible material. In buildings of Type 3 and 4 construction, the hangers and framing may be of combustible material, provided there is compliance with Table 504.3.

512.3 Luminous Ceilings of Noncombustible Material.

A. Luminous ceilings constructed of noncombustible materials may be used in buildings of all occupancy groups. Luminous ceilings are those having more than 20 percent of their area consisting of translucent, louvered, egg crated, mesh or similar material supported on a frame or grid which is hung from the floor or roof.

B. Glass other than wired glass or heat resistant glass having a minimum coefficient of expansion of 36 x 10^{-7} inches per inch per degree Centigrade, shall have no pane larger than 8 square feet in area when used in suspended ceilings.

C. Luminous ceilings installed under sprinkler heads shall be constructed of noncombustible louvers, egg crating, mesh or other open material installed so as not to impede the intended coverage of the sprinkler heads, nor access to all heads and valves of sprinkler system.

512.4 Plastic Light Diffusing Systems.

A. Plastic light diffusing systems shall not be installed in hazardous use groups, any exit, exit passageway, corridor, or any room in which the net floor area per occupant is less than 20 square feet. The plastic diffuser shall be supported directly or indirectly from ceiling or roof construction by use of noncombustible hangers.

B. A plastic light diffusing system shall comply with 504.3 unless the plastic light diffusing system consists of approved light transmitting plastic panels as provided in 501.4 which will fall from their mountings before being ignited by the application of heat.

C. Individual panels or units shall not exceed 10 feet in length.

D. No plastic light diffusing system shall be installed below sprinklers unless appropriate tests by a nationally recognized testing agency have shown that such system does not prevent effective protection by the sprinklers; or unless sprinklers are located both above and below the light diffusing system.

512.5 Firestopping of Ceiling Spaces. Ceiling spaces in floor and roof construction in which the secondary structural members are not individually encased in fire resistive materials or assemblies of component materials, shall be firestopped in areas of not more than 3,000 square feet with noncombustible materials. Such firestopping shall comply with Sec. 515.0.

512.6 Firestopping of Wood Joist Construction. Where the ceilings are suspended below wood joist floor construction, the space between the ceilings and the floor above shall be firestopped in areas of not more than 1,000 square feet with materials complying with Sec. 515.0.

Sec. 513.0 Roof Framing.

513.1 Fire Resistance Rating.

A. Where roof framing is required to be protected in Table 505.0, the individual members shall be entirely encased in materials or assemblies having the specified fire resistance ratings, except that individual covering of members may be omitted, when a continuous ceiling of the specified fire resistance rating is provided below the roof framing.

B. The enclosed space when trusses are used shall have an access door with maximum dimensions of 3 x 3 feet equipped with an opening protective of the same fire rating as required for the roof framing in Items 11 or 12 of Table 505.0. When the trusses or the roof decking are permitted to be constructed of combustible materials, the space above the fire resistive ceiling shall be sub-divided into maximum areas of 3,000 square feet as required for attic spaces in 402.9. These spaces may be vented to the outside to prevent condensation.

513.2 Clearance from Combustible Contents.

A. The fire resistance for roof framing and deck as covered by Item 12A of Table 505.0 shall be permitted only when the clearance from the underside of the lowest member of the roof to the top of combustible stock piles is more than 10 feet.

B. The fire resistance for roof framing and deck as covered by Items 12B of Table 505.0 shall be permitted only when the clearance from the underside of the lowest member of the roof to the top of combustible stock piles is more than 15 feet.

C. When the clearance from the underside of the lowest member of the roof to the top of combustible stock piles is less than as provided in 513.2.A or 513.2.B, the fire resistance for roof framing and deck shall comply with Item 11 of Table 505.0.

Sec. 514.0 Fire Doors and Windows.

514.1 Acceptable Assemblies. Assemblies of fire windows, fire doors, and fire shutters shall comply with accepted engineering practices.

514.2 Fire Doors.

A. Fire door assemblies shall be constructed of any material or assembly of component materials that complies with Table 514.2.A.

Table 514.2.A

Fire Resistance Rating of Fire Walls, Divisions or Partitions in which Opening Occurs Hours	Fire Protection Rating of Opening Protective Hours
Fire Walls and Fire Divisions (1)	
4 or 3	3 (Class A) (2)
2	1½ (Class B)
Shaft Enclosure Walls	
2	1½ (Class B)
¾	¾ (Class C)
Exit Passageway Walls	
2	1½ (Class B)
Fire Partitions and Fire Resistive Partitions	
2 or 1½	1½ (Class B)
1 or ¾	¾ (Class C)

Notes to Table

1. Fire doors in openings over 120 square feet in area shall have a fire resistance rating of not less than 3 hours, and the openings shall be protected by water spray protection as required by 508.8.
2. Opening protective may consist of two 1½ hour (Class B) opening protectives, with one protective installed on each face of a fire wall or fire division.

B. When two fire door assemblies are each installed on opposite sides of the same opening, the combined assembly shall be accepted as having a fire resistance rating equal to the sum of the two fire door assembly ratings. Such combined fire protection shall not be less than the fire resistance required for the opening.

C. Fire door assemblies of larger size than those available under a listing shall be accepted when they bear a certificate of inspection of the Underwriters' Laboratories or when they are certified by the architect or engineer of record to provide construction equivalent to that of a required fire door assembly.

D. Wired glass panels not less than ¼ inch thick shall be permitted in fire doors in accordance with Table 514.2.D.

Table 514.2.D

Location	Maximum Glass Area (Total Each Individual Door)
Class A—3 hour or more	None
Class B—1 or 1½ hour	100 square inches
Class C—¾ hour	1296 square inches (1)
Class D—1½ hour	None
Class E—¾ hour	720 square inches (1)

Note to Table

1. No dimension of opening shall exceed 54 inches.

E. All fire doors shall be self-closing and shall be closed during occupancy of the building except that the Bureau may accept the use of automatic closing devices as provided in accepted engineering practice on doors that are normally required to be open for ventilation or other specified purposes when the safety of the occupants is not endangered.

514.3 Fire Windows and Shutters.

A. When fire shutters of the swinging type are in exterior openings, at least one row in every 3 vertical rows shall be arranged to be readily opened from the outside and shall be identified by distinguishing marks or letters not less than 6 inches high.

B. All metal mullions which exceed a nominal height of 12 feet shall be protected with insulating materials to afford the same fire resistance rating as required for the wall construction in which the protective is located.

514.4 WATER SPRAY OPENING PROTECTION. Horizontal openings in fire walls and partitions, which cannot be protected with fire door assemblies, shall be protected with water spray as provided by 508.8.

SEC. 515.0 FIRESTOPPING.

515.1 WHEN USED. Firestopping shall be designed and constructed to close all concealed draft openings and to form effectual fire barriers against the spread of fire between stories of buildings and in all open structural spaces of buildings, including the following locations: combustible wall, partition and floor framing; ceiling spaces and open spaces behind accoustical and other finishes; floor sleeper spaces; pipe, duct and flue openings; and fire dampers and curtains.

515.2 MATERIALS. All firestopping shall consist of noncombustible materials securely fastened in place, except that 2 thicknesses of 2 inch lumber with broken lap joints or one thickness of 2 inch lumber installed with tight joints shall be permitted to firestop open spaces of wood framing.

SEC. 516.0 ROOF OPENINGS.

516.1 SCUTTLES. Unless provided with other approved means of access to the roof, every building and structure more than two stories in height, except buildings having roofs with a pitch greater than 20 degrees, shall have an access trap door not less than 2 x 3 feet in area, securely attached or anchored to the roof framing, with ladder leading thereto from the top story. The trap door or scuttle shall be fire-resistive in Type 1-A and 1-B construction and noncombustible in Type 2 construction, and noncombustible or wood covered on top with sheet metal in Type 3 or Type 4-A construction.

516.2 SKYLIGHTS.

A. Skylights on buildings of Type 1 or 2 construction shall have the sash and frames thereof constructed of metal or other noncombustible materials. In foundries or buildings where acid fumes, deleterious to metal are necessary to the use of the building, treated wood or other non-corroding materials shall be permitted.

B. Skylights in all locations other than over shafts or when used for smoke and heat venting in Sec. 1309.0, shall be glazed with wired glass, glass block construction, plastic, or other glazing material. No single pane of wired glass shall exceed 720 square inches in area or 54 inches in any dimension.

C. Skylight assemblies may be glazed with approved plastic materials, except in hazardous use groups, in accordance with the following:

1. The plastic shall be mounted above the plane of the roof on a curb constructed consistent with the requirements for the type of construction classification.
2. Each skylight unit shall have a maximum area within the curb of 100 square feet.
3. The aggregate area of skylights shall not exceed 25 percent of the floor area of the room or space sheltered by the roof in which they are installed.
4. Skylights shall be separated from each other by a distance of not less than 4 feet measured in a horizontal plane.
5. Where exterior wall openings are required to be fire protected by Sec. 507.0, no skylight shall be installed within 6 feet of such exterior wall.
6. Combinations of plastic roof panels and skylights shall be subject to the area, percentage limitations and separation requirements applicable to roof panel installations.

SEC. 517.0 SHAFT AND HOISTWAY VENTING DEVICES.

517.1 REQUIRED VENTING. All shafts or hoistways when required by Sec. 511.0 shall be provided with skylights or windows not less than 25 percent of the area of the shaft or with an automatic vent opening device providing a clear opening area of not less than 10 percent of the shaft area.

517.2 SKYLIGHTS.

A. Skylights placed over shaftways shall be glazed with plain glass not more than $\frac{3}{16}$ inches thick or approved light transmitting plastic materials which are able to be vented readily.

B. Plain glass skylights shall be provided with substantial corrosion-resistive metal or other approved noncombustible screens having a mesh not less than $\frac{3}{4}$ x $\frac{3}{4}$ inch nor larger than 1 x 1 inch, constructed of not lighter than No. 12 B&S gauge wires. The screen shall be erected at a distance of not less than 4 nor more than 10 inches above all glazed portions of the skylight and shall project on all sides for a distance of not less than the height of the screen above the glass. A similar screen shall be placed below the skylight in stair shafts to afford protection to the occupants of the building.

517.3 Windows. Windows used for venting shall have the sill not less than 18 inches above the adjoining roof and not less than 18 inches above the top of any door serving the top floor of the shaft. Such windows shall not be located within 10 feet of an interior lot line nor within 20 feet of any opposing opening unless such opening is provided with not less than a ¾ hour opening protective.

517.4 Automatic Vents. Vents shall open automatically by means of rate of rise, heat actuated, or smoke actuated device. Vent openings exceeding six square feet shall have grill protection below with a maximum opening of 6 inches and capable of supporting a concentrated load of 200 pounds at any point. Self-burnout unit type vents shall comply with accepted engineering practice.

Sec. 518.0 Roof Structures.

518.1 General. All construction, other than minor roof structures covered in 402.5, erected above the roof or any part of any building or structure located within the fire limits or of any building or structure more than 40 feet in height outside the fire limits, shall be constructed of noncombustible material.

518.2 Fire Resistive Enclosures.

A. All roof structures unless constructed of masonry or reinforced concrete or unless erected on buildings and structures of Type 1 or 2 construction shall be enclosed in walls of noncombustible materials having a fire resistance rating of not less than ¾ hours, protected with weather-resistive roof or wall coverings, except as provided in 518.2.B and 518.4.B.

B. Roof structures erected on the roof of buildings of Type 3 or 4-A construction may be constructed of combustible materials protected to afford a ¾ hour fire resistance rating covered on the outside with approved roofing material.

518.3 Penthouses.

A. Penthouses occupying more than one third of the roof area, or exceeding 2,500 square feet with an assigned number of employees, or exceeding 10,000 square feet in any case shall be considered a story of the building and the enclosure shall conform to the requirements for exterior walls of the building type.

B. When the exterior wall of a penthouse is recessed 5 feet or more from the exterior wall of the next lower story which is required to have a greater fire resistance, it may be constructed of material having a fire resistance rating of not less than 1½ hours, when protected on the outside with noncombustible material and supported on fire resistive construction.

518.4 Mansards and Sloping Roof.

A. Every mansard or other sloping roof having a pitch of more than 60 degrees to the horizontal on any building or structure over 40 feet in height shall be constructed of noncombustible materials having a fire resistance rating of not less than ¾ hours; except that when the building is more than 6 stories or 75 feet in height, such mansards shall have the same fire resistance rating as for the exterior walls of the building but need not exceed 1½ hour.

B. When the pitch is less than 60 degrees to the horizontal, the mansard or sloping roof located on any building of Type 2, 3, or 4 construction may be constructed of the same materials as the roof of the building and the face and back of the mansard may be protected with approved roof coverings.

518.5 Dormer Windows. All dormer windows shall be of the same type of construction as the roof and side walls of the building on which they are located. Dormer roofs shall be protected with roof covering of the same type and fire resistance as the roofing of the building.

518.6 Water Tanks.

A. Water tanks shall be installed in accordance with accepted engineering practice.

B. Water tanks having a capacity of more than 500 gallons placed in or on a building shall be supported on Type 3-A noncombustible framing, or except that when such supports are located within the building, they shall be fire protected as required for the building type, but not less than the fire grading of the use group listed in Table 303.1.

C. A pipe or outlet shall be located in the bottom or in the side close to the bottom, and the tank shall be fitted with a quick-opening valve to enable the contents to be discharged in an emergency to a suitable drain.

D. No tank shall be located over or near a stairway, elevator or other interior shaft unless a solid roof or floor deck of the necessary strength is constructed underneath the tank.

E. All unenclosed roof tanks exposed to the weather shall have approved covers sloping toward the outer edges.

F. When metal hoops are used in the construction of wood tanks, they shall be protected with acceptable corrosion-resistive coatings or shall be manufactured from approved corrosion-resistive alloys.

518.7 Cooling Towers.

A. Cooling towers shall be installed in accordance with accepted engineering practice.

B. Cooling towers erected on the roofs of buildings shall be constructed of noncombustible materials, except that drip bars may be of wood.

C. Cooling towers not located on buildings may be constructed of wood or other materials of similar combustible characteristics.

518.8 Spires and Similar Structures.

A. All spires, towers, or cupolas shall be erected of the type of construction and fire-resistive rating required for the building to which they are accessory as provided by Tables 303.1 and 505.0 except that when the height of such appurtenant structures exceeds 85 feet above grade or when the area at any horizontal section of the spire, tower, or cupola exceeds 200 square feet or when it is used for any purpose other than as architectural embellishment, the structure and its supports shall be of Type 1 or 2 construction.

B. Radio and television towers and antennae shall be constructed to comply with Article 7.

Sec. 519.0 Roof Coverings and Decks.

519.1 Classification. Roof coverings shall be classified in accordance with accepted engineering practice.

519.2 Limitations of Use. Roofs placed on buildings shall be covered with Class A or Class B roof coverings except as follows:

A. Class C roofing may be used on buildings of Type 2-C, 3 or 4 when they are located outside the fire limits and do not exceed the tabular areas or heights in Table 401.1.

B. Plastic sheets, either translucent or opaque, used as roofing shall comply with 501.4.

519.3 Existing Roofs. Not more than 25 percent of the area of an existing roof shall be replaced or repaired in any 12 month period unless the entire roof is made to conform with these requirements for new roofing.

519.4 Fire and Party Wall Restrictions. No wood planking, sheating, or other combustible decking when used in roof construction shall extend through or over any party wall or fire wall or across any lot line.

519.5 Roof Insulation. The use of combustible roof insulation shall be permitted provided it is covered with the appropriate roof covering.

519.6 Plastic Roof Panels.

A. Approved plastic materials may be used as roof panels, where the roof is not required to have a fire resistance rating, except in hazardous use groups and all assembly-theater and night club use groups.

B. Individual roof panels shall be separated from each other by a distance of not less than 4 feet measured in a horizontal plane.

C. Where exterior wall openings are required to be fire protected by Sec. 507.0, no roof panel shall be installed within 6 feet of such exterior wall.

D. Area limitations for plastic roof panels in the construction and use groups covered by 519.6.A shall be in accordance with Table 519.6.D.

Table 519.6.D

Class of Plastic	Maximum Area Individual Unit of Panel Sq. Ft.	Maximum Aggregate Area as a Percent of Floor Area
SE	300	30
VSB	200	25
SB	100	20

ARTICLE 6

MEANS OF EGRESS

Sec. 600.0 Scope.

This Article of the code shall apply to the design, construction, protection, location, arrangement and maintenance of required exit facilities to provide a safe means of egress from buildings hereafter erected, increased in size, altered, or changed in occupancy. Existing buildings shall comply with Sec. 602.0.

Sec. 601.0 General Egress Requirements.

601.1 Location and Arrangement. All approved exits shall be arranged and constructed as provided in this code.

A. Visibility and Accessibility. All required exits shall be visible and shall be so located as to be readily accessible with unobstructed access and so arranged as to lead directly and continuously to the street or to an area of refuge with means of egress to a street.

B. Remote Location. Whenever more than one means of egress is required from any room, space or floor of a building, they shall be placed as remote from each other as practicable.

C. Tenant Spaces. Where more than one tenant occupies a floor of a building, each tenant shall be provided with access to the required exits without passing through premises occupied by any other tenant.

D. Exit Discharge. All vertical exits shall extend continuously so as to discharge directly, or by way of a yard, court, or exit passageway to a street. Each yard or court shall have a width not less than 3 feet or as required for an exit passageway in Sec. 609.0.

E. Access for Handicapped. Where grade conditions warrant it, access for the handicapped shall be provided by ramps in conformance with 615.2.

F. Adjacent to Hazardous Materials. Exits shall not discharge near or adjacent to installations storing materials that are flammable, or which may react to cause a fire or explosion, or which are toxic, chemically unstable, or may spontaneously form explosive compounds.

601.2 Maintenance of Exits. The employer or owner of every building and structure shall be responsible for the safety of all persons in such premises with respect to the adequacy of means of egress.

A. Obstructions. The clear width of any door, hall, passage or any other required exit shall not be obstructed or reduced in any manner.

B. Exterior Exits. Fire escape stairs, fire escapes, exterior balconies, porches, galleries, or roofs used for access to an exit shall be kept clear of all flower boxes, pots and other obstructions. No display sign or other obstruction shall be attached to the building so as to interfere with the free operation and use of such means of egress. They shall be kept free of snow and ice and shall be maintained in a safe condition.

601.3 Accepted Engineering Practice. Except where specifically covered in this Article, compliance with accepted engineering practice shall be deemed to meet the requirements of this code.

601.4 Windowless Buildings. In all buildings without exterior window openings in all stories, the exit shall be located so as to be accessible to the fire department through the access openings specified in 507.5.

601.5 Modification. Where strict compliance with this Article is impractical, the Bureau may approve alternate means of egress which will accomplish the same purpose in accordance with the procedure established in Sec. 124.0.

Sec. 602.0 Existing Buildings.

602.1 As New Buildings. Exits in existing buildings shall comply with the exit requirements for new buildings except as provided in 602.2 through 602.6.

602.2 Enclosures. All existing unenclosed stairs required by this code for egress in industrial buildings exceeding two stories and in all other buildings exceeding three stories, shall be enclosed with partitions and opening protectives having a fire resistance rating of not less than ¾ hours and shall be ventilated in accordance with Sec. 508.0.

602.3 Fire Escapes. Class B fire escapes complying with Sec. 614.0 may be accepted as a secondary means of egress in existing residential buildings not over 5 stories and all other buildings not over 4 stories or 45 feet in height, when access to the street is provided from the termination of the fire escape.

602.4 Alterations. The means of egress in existing buildings or structures shall not be reduced or altered below the requirements for the use or occupancy of new buildings.

602.5 Existing Use Changed. In every building or structure in which there is a change from one use group to another or when there is an increase in occupancy load, the exit facilities serving the new use and occupancy shall be made to comply with the provisions of this Article for new buildings.

602.6 Additions to Existing Buildings. When an addition is made to an existing building, the integrity of existing exits shall be maintained.

Sec. 603.0 Exit Requirements.

603.1 Determination of. The determination of proper exits of a building shall be based on its occupancy group classification, the number of occupants, the travel distance to an exit, the capacity of exits and the construction class of the building. Every floor of a building shall be provided with exit facilities for its occupancy load. The occupancy load of floors shall not be cumulative for the purpose of designing vertical exits, except where one floor is used by another as a means of egress and except in places of assembly. Vertical exits from any floor above the street floor may serve simultaneously all floors above the street floor and vertical exits from any floor below the street floor may serve simultaneously any floor below the street floor.

603.2 Mixed Occupancy. When a building is classified in more than one occupancy group the exit requirements of the entire building shall be based on that having the strictest exit requirements, or the exit requirements for each building section shall be determined separately where they can be segregated.

603.3 Multiple Use. Where a building, floor, or space is used for multiple purposes involving different activities at different times, that occupancy which involves the greatest number of occupants shall be used in determining the exit requirement.

603.4 Incidental Occupancies. When a building contains incidental occupancies classified as other than the principal occupancy, the exit requirements, except those applying to the space of the incidental occupancy, shall be based on those applying to the occupancy under which the building is classified.

Sec. 604.0 Design Occupancy Load.

604.1 Occupancy Allowance. The number of persons to be provided for in determining exit facilities on any given floor area shall be actual normal occupancy for which the floor area or part thereof is designed; but in no case less than the number which can be accommodated on the floor area within the perimeter of the building, not including the area of exterior walls, or of elevator, stair or other shaft enclosures, at the rate of one person per unit of area as established in Table 604.1. The occupancy load of any space shall include the persons discharging into or through it.

Table 604.1
Occupancy Allowances

Use Group	Gross Floor Area in Sq. Ft. Per Occupant
Assembly with fixed seats	6
Assembly without fixed seats	15
Business Buildings	100
Court Rooms	40
Dance Halls, Lodge Rooms	15
Industrial Buildings	100
Mercantile Buildings, First Floor	30
Mercantile Buildings, Basement Sales Floor	30
Mercantile Buildings, Other Floors	60
Storage Buildings	300
Bowling Alleys, allow 5 persons for each alley including 15 feet of runway, and for additional areas	10

604.2 Mixed Occupancies. When incidental or mixed occupancies occur increasing the occupancy load above that determined by use of Table 604.1, the load of these spaces shall be determined by accepted engineering practice and where the use is not listed the load shall be established by the Bureau.

604.3 Modifications. When the designed occupancy load of a space creates a hardship when the load is determined by 604.1, the Bureau may establish the basis for the occupancy load. When an existing building is altered or changed in occupancy or use to require enlarged exit facilities, the Bureau may authorize the alteration or change in occupancy without enlargement of the exit facilities provided the occupancy load is limited to that permitted by the provisions for existing exit facilities. In each of the above instances the building or space shall be posted with a sign complying with Sec. 119.0.

604.4 Non-Simultaneous Occupancy. The occupancy load of toilets, locker rooms, meeting rooms, storage rooms, employee cafeteria and similar rooms or spaces which are not occupied at the same time as other rooms or spaces on the same floor of a building, may be omitted from the occupancy load of the floor, to the extent such spaces serve other occupied rooms on the same floor.

604.5 Mezzanine Floors. The occupancy load of a mezzanine floor discharging through a floor below shall be added to the main floor occupancy and the capacity of the exits from the main floor shall be designed for the total occupancy load of both floors.

604.6 Roofs. Roof areas occupied as roof gardens, for assembly, storage, or other purposes shall be provided with exit facilities to accommodate the required occupancy load, but in no case shall there be less than two approved means of egress, except where access to the roof is required only for transient purposes.

Sec. 605.0 Capacity of Exits.

605.1 Unit Exit Width. The unit of exit width for all exits and egress facilities shall be 22 inches with a credit of ½ unit for each 12 inches of width in addition to one or more units of exit width. The number of persons per unit of exit width shall be determined by the occupancy group classification and the exit type as listed in Table 605.1 except as modified by Sec. 702.0.

Table 605.1

Capacity Per Unit Exit Width (1)

	Number of Occupants			
Use Group	Corridors, Passageways, Ramps, and Horizontal Exits	Stairs	Interior Doors	Exterior Doors
High Hazard	50	30	40	50
Storage	75	45	60	75
Mercantile	100	60	80	100
Industrial	100	60	80	100
Business	100	60	80	100
Assembly	100	60	80	100

Note to Table

1. The capacity per unit of exit width for escalators used as required exits shall be 66⅔ percent of that established for stairs for the applicable use group.

605.2 Grade Floor Exits. Grade floor exits shall provide units of exit width as provided for exterior doors in Table 605.1 for all occupants of that floor and in addition 1½ units of exit width for each two units of exit width of vertical exits from floors above or below the grade floor using the grade floor as a means of egress and not discharging directly to the outside at grade.

Sec. 606.0 Travel Distance.

606.1 To Exits. The maximum travel distance from the most remote point in any room or space or as provided in 606.2, 606.3, and 606.4 to a door opening into an open exterior space, a vertical exit enclosure, an exit tunnel, an exterior stair, or to a horizontal exit shall be not greater than the distance specified in Table 606.1, except as specified in Sec. 618.0 for unlimited area buildings.

Table 606.1

Length of Travel to Exits

	Travel Distance in Feet		
Use Group	Unsprinklered Construction	Sprinklered Construction	Dead End
High Hazard	(1)	75	(1)
Storage	100	150(2)	50
Mercantile	100	150(2)	50
Industrial	100	150(2)	50
Business	200	300	50
Places of Assembly	100	150	25

Notes to Table

1. Not permitted.
2. In other than unlimited area buildings, when heat venting of ¾ of one percent is provided but when heat and smoke venting is not otherwise required, the travel distance may be increased 50 percent.
3. The travel distance in unlimited area buildings over 200 feet in width shall not exceed 75 percent of the mean width of the building.

606.2 Mercantile Occupancies. The travel distance may be measured from a door opening from a room not used for sales purposes, such as an office, rest, fitting, or stockroom to an open sales space provided the travel distance within the room does not exceed 50 feet.

606.3 Fire Detection Systems. In buildings equipped with an automatic fire detection system complying with Sec. 760.0, the travel distance for all occupancy groups other than theaters shall be the same as permitted for sprinklered construction in Table 606.1.

606.4 Measurement. The travel distance shall be measured as provided in accordance with accepted engineering practice.

606.5 Common Path of Travel. When two or more exits are required, the common path of travel not longer than the dead end permitted in Table 606.1, may be permitted for the first part of the path of travel from any point or door, as the case may be, to a required exit.

Sec. 607.0 Number of Exits.

607.1 Two Exits Required. There shall be not less than two approved exits serving every floor except only one exit shall be required as provided in 607.2 through 607.4.

607.2 Business Buildings. One means of egress may be accepted in business buildings not over two stories in height or not over 4,000 square feet in area of Type 1 or Type 2-A construction, or not over 3,000 square feet in area in other types of construction where the travel distance from the second floor to the exit does not exceed 75 feet and the occupancy load does not exceed 25.

607.3 Industrial Buildings. One means of egress may be accepted in industrial buildings not over two stories in height or over 1500 square feet in area of Type 1, Type 2-A or Type 2-B construction where the second floor distance of travel to the exit does not exceed 75 feet and the occupancy load does not exceed 25.

607.4 Transient Use. One means of egress may be accepted in spaces such as roofs, open structures or other special areas in all occupancy groups where the occupancy is transient and used only for repair, maintenance, service, or similar purposes.

607.5 Special Use and Occupancy. Exit facilities for special use and occupancy shall comply with Sec. 702.0.

Sec. 608.0 Aisles, Halls, and Obstructions.

608.1 Availability. Safe and continuous aisles, halls or corridors providing access to exits shall be available from any point on any floor and be maintained free of obstruction at all times.

608.2 Capacity. The capacity of aisles, halls, and corridors in determining the required width, measured in units of exit width, shall be as listed for corridors in Table 605.1.

608.3 Minimum Width. The width of any aisle shall be not less than 30 inches, nor of any hall or corridor not less than 36 inches, nor less than the occupancy load it accommodates, nor when it accommodates all travel to an exit, less than the width of that exit and in no case shall a corridor be less than 44 inches in width for mercantile, industrial or business occupancies.

608.4 Height. Corridors shall have a minimum height of at least 7 feet 6 inches for at least 75 percent of the floor area with no point less than 7 feet. No projection shall be located so as to obstruct full view of exit signs. Aisles and halls shall have a minimum height of not less than 7 feet.

608.5 Dead Ends. Dead ends in corridors shall not be permitted to exceed the dimension for dead ends in Table 606.1, except that when a corridor is completely enclosed in construction having a fire resistance rating of not less than 2 hours with all room door opening protectives having a fire resistance rating of at least 1½ hours, the permissible length of the dead end may be increased 100 percent above the length listed in Table 606.1.

608.6 Construction. Corridor construction shall comply with the fire resistance ratings of Table 505.0, except that corridors serving spaces in the same occupancy and tenancy need only be noncombustible construction or approved fire retardant lumber in Type 1 and Type 2 construction, and may be combustible construction in Type 3 or Type 4 construction.

608.7 Borrowed Light. No openable transoms shall be permitted in wall or door openings of corridors, except that fixed panels may be permitted in not more than 20 percent of the wall and door area with the area of each panel limited to that indicated in Table 608.7.

Table 608.7

Corridor Construction	Panel	Maximum Area per Panel Square Inches
¾ hour	Wired glass ¼ inch or thicker	1440
¾ hour	Tempered glass 7/32 inch or thicker	720

608.8 Interior Finish. The interior finish of all corridors shall be in accordance with Table 504.3.

Sec. 609.0 Exit Passageways.

609.1 Free of Obstructions. Exit passageways shall be maintained free of obstruction at all times.

609.2 Capacity. The capacity of exit passageways shall be determined for the occupancy on the basis of units of exit width from Table 605.1.

609.3 Width. No exit passageway shall be less wide than the vertical exit it serves and when a passageway serves two or more vertical exits it shall not be less than 75 percent of the total width of all vertical exits served.

609.4 Height. Exit passageways shall have a clear height of 7 feet 6 inches for at least 75 percent of the floor area, with no point less than 7 feet in height. No projection shall be located so as to obstruct full view of exit signs.

609.5 Enclosure. The construction of exit passageways shall be as required by Table 505.0 for the applicable construction type of the building.

609.6 Opening. No openings other than exit doors shall be permitted in exit passageways except as provided in 609.9B.

609.7 Interior Finish. The interior finish of exit passageways shall be in accord with Table 504.3.

609.8 Egress by Way of Exit Passageways. Exit passageways may serve as a means of egress from one vertical exit to another exit or to the outside. In buildings with two or more vertical exits, not more than 50 percent shall discharge into a single exit passageway which is provided with only one means of egress. One hundred percent of all vertical exits may discharge into an exit passageway when the passageway provides two or more means of egress to the exterior at grade from each vertical exit and when each means of egress is remote from one another.

609.9 Street Floor Lobbies. Exit passageways which serve as street lobbies shall comply with the following:

A. Opening Protectives. Door openings between street floor lobbies and interior communicating spaces shall be at least 1½ hour self-closing fire doors, except that when the communicating space is in assembly occupancies, or is completely sprinklered and in low hazard storage, mercantile, industrial or business occupancies they shall be at least ¾ hour self-closing fire doors. Glass or other noncombustible doors may be used if installed in combination with a 1½ hour automatic fire door activated by a rate of rise temperature device. The maximum door opening area may not exceed 20 percent of the common wall between the lobby and the communicating space.

B. Show Windows. Show windows facing street floor lobbies shall have a maximum floor area of not more than 24 square feet, shall be protected by automatic sprinklers, glazed with ¼ inch polished plate glass or equivalent and backed by construction having a fire resistance rating of not less than 2 hours. Openings in the show window back construction shall be protected as required in 609.9.A. Adjoining show windows shall be separated from each other by construction having a fire resistance rating of not less than 2 hours.

C. Permitted Uses. Street floor lobbies may be occupied by newsstands, candy and tobacco stands or information booths, when constructed of noncombustible materials, when they occupy not more than 5 percent of the net floor area and when they do not reduce the required clear width of the lobby at any point.

609.10 Exit Tunnels. Where main floor areas are too large for direct exits to the outside of the building within the limitation of maximum travel distance to reach exits, or where used for communication with other buildings, tunnels shall constitute acceptable exit passageways or horizontal exits when complying with the following:

A. Tunnels more than 100 feet long shall not be less than 8 feet wide and 8 feet high in the clear and shall be provided with adequate artificial light and ventilation.

B. Tunnels shall be reached directly by open stairs or ramps from the floor above.

C. Tunnels shall be of at least two hour fire resistance construction and shall contain no combustible occupancy.

D. Tunnels shall be enclosed at each end by self-closing swinging fire doors having a fire resistance rating of not less than 1½ hours with the swing in the direction of exit travel.

E. Tunnels shall discharge into a means of egress providing access to the street.

F. No tunnel shall be accepted as a means of egress unless regularly used during normal occupancy, or during fire exit drills.

G. Tunnels shall be provided with an emergency lighting system complying with 903.7.

H. Tunnels may serve as a means of access to toilet facilities and to employee locker rooms if sprinklered and separated by self-closing fire doors normally kept closed.

Sec. 610.0 Exit Doors and Access Doors.

610.1 Door Construction.

A. All required exit doors shall be self-closing fire doors complying with Sec. 514.0, except grade floor exit doors complying with 610.1.B and approved collapsible revolving doors complying with 610.6.

B. Exit doors at grade other than from stair enclosures, may be glazed with plate glass not less than 7/32 inches thick, or with any other approved glazing materials of equal fire resistance and flame resistance. Glass doors having one or more unframed edges may be used provided they are constructed of tempered glass not less than 3/4 inches thick. Automatic horizontally sliding fire doors shall not be permitted in horizontal exits.

610.2 Number of Doors. Rooms or spaces except as provided in Article 7 shall be provided with means of egress in accordance with Table 610.2.

Table 610.2

Occupancy Load	Number of Doors	Direction of Door Swing
10 or less	1	Swing in or out.
11 to 25	1	Swing out, except if provided with more than one door, all may swing in.
26 to 60	2	At least one shall swing out.
	3	None required to swing out.
Over 60	2 or more	All shall swing out.

610.3 Door Opening Widths and Capacity. The unit of width for exit and access door openings shall be 22 inches. Door jambs or stops and the door thickness when open shall not reduce the required width by more than two inches for each 22 inches of width.

610.4 Size of Doors. The minimum width of single exit doors shall be 30 inches and the maximum shall be 44 inches. When the door is subdivided into two or more separate openings, the minimum clear width of each opening shall be not less than 30 inches and each opening shall be computed separately in determining the number of required units of exit width. A door 40 inches in width shall be deemed the equivalent of two full units of exit width. The height of exit doors shall in no case be less than 6 feet 8 inches except that the opening may be reduced by not more than two inches by projections such as stops, sills or closures. The nominal door dimensions shall be used for computing required size of doors.

610.5 Door Hardware.

A. Locks and fastenings on required exit doors shall be readily opened from the inner side without the use of keys. Draw bolts, hooks and similar devices shall be prohibited on all required exit doors.

B. Exit doors in rooms, floors, or buildings which are locked during occupancy shall be equipped with approved panic proof latches or bolts which release under a pressure of 15 pounds in assembly use Group F-2 with an occupancy load of more than 75; in mercantile use group and industrial use group with an occupancy load of more than 200; and in all other occupancies and places of public assembly with an occupancy load of more than 300.

C. Fire door opening protectives of specified fire resistance rating shall include approved hardware in the assembly.

610.6 Revolving Doors.

A. Except in industrial buildings and places of assembly with an occupancy load of more than 200, automatic collapsible revolving doors, when constructed and installed as provided by accepted engineering practice, shall be accepted as supplemental exit doors from the first floor to the street but not to exceed 50 percent of the total required grade floor exits.

B. Where revolving doors are permitted, swinging doors shall be provided to furnish one-half of the required exit width in accordance with Sec. 610.0 and at least one swinging door shall be located adjacent to and not more than 20 feet from each revolving door.

C. Automatic collapsible revolving doors approved as required exits shall provide not less than a clear unit of exit width at the narrowest points of passage through the vestibule when the leaves are in the collapsed position.

D. The diameter of approved revolving doors shall not be less than 6½ feet.

610.7 Turnstiles. No turnstiles or similar devices designed to restrict travel to one direction shall be placed so as to obstruct any required exit. When used they shall be not more than 36 inches nor less than 30 inches in height and turn freely in the direction of exit travel. Each turnstile shall provide a travel width of not less than 22 inches and may not be credited with more than one unit of exit width. Not more than 50 percent of the required exit capacity may be provided by turnstiles at any location. The balance of the required exit capacity at that location shall be provided by swinging doors not more remote from the turnstile than 20 feet.

610.8 Power Operated Doors. Power operated doors shall remain closed in case of power failure but be manually operable. No power operated door shall be credited as a required exit unless it can be made to swing in the direction of exit travel.

610.9 Access Doors.

A. Doors from rooms or spaces opening into corridors which require a fire resistance rating and which provide access in only one direction to an exit shall be self-closing swinging fire doors with a Class C fire protection rating.

B. Doors from rooms or spaces opening into corridors which require a fire resistance rating and which lead to an exit or exits shall be self-closing swinging doors providing protection at least equivalent to 1¾ inch solid bonded cone wood doors.

C. Doors from rooms and spaces opening into corridors that do not require a fire resistance rating shall be self-closing swinging doors providing protection equivalent to metal covered wood doors, hollow metal doors or ¾ inch thick solid tempered glass doors.

D. Doors opening into corridors may have glazed panels not exceeding panel sizes permitted in Table 608.7.

E. No exit door shall open immediately on a flight of stairs or step, but a landing the length and width of which are not less than the width of such door, shall be provided between such door and such stairs or step.

F. Noncombustible mail slots having an area not exceeding 40 square inches may be provided in the door when the slot is protected by a closure activated by gravity or a device which keeps it closed when not in use.

Sec. 611.0 Horizontal Exits.

611.1 As Approved Means of Egress. Horizontal exits shall be accepted as an approved means of egress. The connection between the areas of refuge may be accomplished by protected openings in a fire wall, or fire partition, or by a vestibule, a tunnel, or an open-air balcony or by a bridge. The capacity of horizontal exits shall be determined on the basis of units of exit width in accordance with Table 605.1. Only the widths of doors swinging in the direction of exit travel shall be counted.

611.2 Opening Protectives. Doors shall be swinging, self-closing doors having a fire resistance rating of 1½ hours, except that doors in fire divisions

having a 3 hour or 4 hour fire resistance rating shall have opening protective as required by Table 514.1.A. Each swinging door shall swing in the direction of exit travel, and when travel is in both directions, as when two areas of refuge serve as areas of refuge for each other, at least two door openings shall be provided, the doors of which shall swing in opposite directions. Signs shall be placed over each door on the side from which egress is made, indicating the exit door.

611.3 Size of Doors. The size of openings in fire walls shall comply with 508.8, but the width of one opening used as a required exit shall not be greater than 88 inches nor shall the area exceed 80 square feet.

611.4 Unlocked Doors. Horizontal exit doors shall be kept unlocked and unobstructed whenever the premises on either side of this exit is occupied.

611.5 Balconies, Bridges and Tunnels. When serving as horizontal exits, vestibules, balconies, bridges and tunnels shall comply with the following:

A. Doors. Exterior doors when opening into balconies or unenclosed bridges serving as horizontal exits shall be self-closing swinging fire doors provided at each end.

B. Floors. The floor level of exterior balconies and bridges shall be approximately 7½ inches lower than the sills of doors opening into them. The floor shall be level on either side of the door and where there is a difference in level between the areas connected by the horizontal exit, the floors of the horizontal exit shall slope not more than one inch in ten inches.

C. Protection. Exterior wall openings within ten feet horizontally or below any open bridge or balcony shall be protected by fire doors or fire windows. Balconies shall not open on yards or courts less than twelve feet wide.

D. Construction. Open bridges and balconies shall have solid floors and be constructed of noncombustible materials. Enclosed and interior bridges shall have walls, floors and roofs or ceilings constructed of materials having a fire resistance rating of not less than 2 hours. Windows of enclosed bridges shall be fire windows affording at least a ¾ hour fire resistance rating.

611.6 Area of Refuge.

A. Occupancy Load. The areas connected by the horizontal exit shall be public areas or areas occupied by the same tenant and each such area of refuge shall be adequate to house the total occupancy load of both connected areas computed on the basis of a net floor area allowance of three square feet for each occupant.

B. Enclosure. An area of refuge shall be enclosed by fire walls or fire partitions having a fire resistance rating of not less than 2 hours, or by exterior walls complying with Table 505.0.

C. Stair Exit. There shall be at least one interior enclosed stair serving each area of refuge. Any fire area not having a stair directly accessible thereto shall not be considered as an area of refuge but as part of an adjoining section with such stair. The length of travel from any point within an area of refuge to either a stair or a horizontal exit shall not exceed the requirements of Sec. 606.0. The total capacity of the stair from each area of refuge shall not be less than the capacity of the horizontal exits leading into any one area of refuge, except that in buildings of other than Type 1 construction the capacity of the vertical exit shall be not less than ½ of the normal occupant load of the area of refuge.

D. Auxiliary Elevator. When horizontal exits are provided in floors located twelve or more stories above grade, the required stairs for each area of refuge shall be supplemented by at least one passenger elevator capable of manual operation, maintained ready for use during normal occupancy of the building, and provided with emergency power complying with 903.7.

Sec. 612.0 Interior Stairs.

612.1 Capacity. The capacity of exit stairs and doors per unit of exit width shall be computed on the basis of Table 605.1 for the respective occupancy group.

612.2 Width. All interior required stairs shall be not less than 44 inches in width except that such width may be reduced to 36 inches in low and moderate hazard storage, mercantile, industrial and business occupancies having an occupancy load on any floor above or below grade of not more than that permitted by Table 605.1 for one unit of exit width. Stairs from mezzanines having an occupancy load not exceeding that permitted for the applicable occupancy for one unit of exit width may be 30 inches wide.

612.3 Headroom. The headroom in all parts of the stair enclosure shall be not less than 6 feet 8 inches.

612.4 Landings and Platforms. The least dimension of landings and platforms shall be not less than the required width of stairs, and the height of rise between landings and intermediate platform shall not exceed 8 feet in industrial, business, and assembly buildings. In all other buildings, no stair shall have a height of rise of more than 12 feet between landings. No single flight of stairs shall have less than three risers.

612.5 Rise and Run. The rise of every step shall not exceed 7½ inches and the run shall be not less than 10 inches. No winders shall be permitted in required stairs, except that curved or skewed stairs with treads having a minimum width of 7 inches and an average width of 9 inches may be permitted.

612.6 Handrails. Stairs shall have continuous walls or guards on each side, plus handrails, except that only one handrail shall be required on stairs less than 36 inches in width. Handrails shall project not more than 3½ inches into the required stair width. When the width exceeds 88 inches, the stairs shall be provided with intermediate handrails dividing the stair in sections of either two or three units of exit width. The height of the handrail shall be not less than 30 inches nor more than 34 inches above the nosing of treads. The handrail shall be continuous or returned to the enclosure walls, guards or posts at the top and bottom of each flight. Handrails in all stairs shall be of materials having a flame spread rating not exceeding 150.

612.7 Stair Doors.

A. Width. The width of every exit door to a stair shall have a capacity of not less than the number of units of exit width required for that portion of the occupancy load which it serves from that floor, but in no case shall such door be less than the minimum widths required by 610.3. Doors providing egress from stair enclosures shall have a capacity equal to that of the stair.

B. Direction of Swing. Doors shall swing on a landing in the direction of exit travel. When opening, a stair exit door at any point of its swing shall not reduce the required width of landings. When the stair exit door is completely open, it shall not interfere with the full capacity of the stairs.

C. Opening Protectives. Required stair exit door opening protectives, including the frames and hardware, shall be self-closing swinging fire doors complying with Sec. 514.0.

D. No exit door shall open immediately on a flight of stairs or step, but a landing the length and width of which are not less than the width of such door, shall be provided between such door and such stair or step.

612.8 Stair Construction.

A. Noncombustible Construction. Except as provided in 612.8.C, all required interior stairs shall be built entirely of noncombustible materials with solid risers, treads and landing platforms and all finish floor substances shall be of non-slip noncombustible materials, except that combustible handrails with a flame spread rating of not more than 150 shall be permitted.

B. Designed Loading. All stairs, platforms and landings shall be adequate to support a live load of 100 pounds per square foot.

C. Combustible Construction. All combustible stairs shall be protected on the underside or soffit by noncombustible finish and be fire stopped at the top and bottom of each flight. Stairs may be of combustible materials in all use groups except high hazard, assembly and institutional; Types 3 and 4 construction; in buildings not over 3 stories or 40 feet in height; or where the occupancy load does not exceed 40 on any floor above or below grade.

612.9 Stair Enclosures.

A. Noncombustible at Least Two Hours. All required interior stairs shall be enclosed in partitions or walls having a fire resistance rating of not less than 2 hours except as provided in 612.9.B.

B. Noncombustible Less Than Two Hours. The fire resistance rating of stair enclosures in Type 1 or Type 2 construction may be reduced from 2 hours to that required for floors for the type of construction used but not to less than ¾ hour rating under the following conditions:

(1) In industrial buildings not more than two stories or 30 feet in height.

(2) In buildings of other use groups except high hazard and assembly not more than three stories or 40 feet in height.

(3) The stair and enclosure are of noncombustible material.

(4) The occupant load does not exceed 40 on any floor above or below grade.

C. Combustible Stair Enclosures. Combustible stairs as permitted by 612.8.C may be enclosed in combustible construction having a fire resistance rating of not less than ¾ hours.

D. Openings in Stair Enclosure Walls. No openings, except the necessary doorways, windows opening to the exterior of the building, and required vents shall be permitted in stair enclosures. There shall be no enclosed usable space under the stairs in an exit enclosure nor shall the open space under such stairs be used for any purpose.

E. Open Stairs. Not more than 50 percent of the required exits from the second floor or from either the basement or cellar, but not both, may be unenclosed stairs to the street grade floor in mercantile, industrial, and business occupancies when:

(1) All the remaining vertical exits serving floors above or below are fully enclosed, continuous exits leading directly to the outside.

(2) The areas served by open stairs are open and unsubdivided and the total of all such areas so connected, does not exceed 100 percent of that permitted for the street grade floor by Table 301.1.

(3) Corridors, rooms or spaces shall be separated from these open areas by construction having a fire resistance rating of not less than ¾ hours but not less than that required for the floor construction, with all openings between them protected as required by Sec. 507.0.

(4) Travel distance to exits on each floor or the travel distance from any point in the open space by way of an open stair to an exterior door opening at grade does not exceed the distance permitted by Sec. 406.0.

(5) In buildings of Types 2-B, 2-C, 3 and 4 construction, all open areas connected by open stairs shall be protected by an automatic sprinkler system complying with Sec. 1301.0.

(6) Basements or cellars in mercantile occupancies in buildings of all construction types when connected by open stairs to floors above, shall be protected by an automatic sprinkler system complying with Sec. 1301.0.

F. Open Stair Construction. Open stairs where permitted may have open risers and stringers or other supports.

612.10 Interior Access Stairs.

A. When Permitted. Interior stairs providing access between not more than two floors or levels and not serving as exits, may be installed when in the same tenancy and when the hazard is rated as low for each of the connected spaces as provided in 612.10.B through 612.10.D.

B. Between Floors. Stairs connecting two floors shall be enclosed with partitions having a fire resistance rating of not less than that required for the floor but not less than ¾ hour with a self-closing door at either the top or bottom, except that in other than storage and industrial occupancies, it need not be so enclosed when the stair is of noncombustible construction in buildings of Type 1 construction or in buildings of other types of construction when each floor so connected is protected by an automatic sprinkler system.

C. Basement Stairs. Access stairs to basements or cellars used for storage or heating shall be separated by construction having a fire resistance rating not less than that required for the floor but not less than ¾ hour, and provided with self-closing doors.

D. Mezzanine Stairs. Stairs connecting a mezzanine and the main floor may be open and unenclosed. The distance traveled over the stair shall be counted as part of the travel distance to the required exit.

Sec. 613.0 Fire Escape Stairs.

613.1 As Means of Egress. Exterior fire escape stairs (Class A) conforming to the requirements for interior stairs in all respects other than the requirements for enclosures and specific modifications listed herein, may be accepted as required means of egress in all buildings provided there is at least one interior vertical exit except as provided in 607.4.

613.2 Minimum Width. Class A fire escape stairs shall have a minimum width of 36 inches except that fire escape stairs may be not less than 24 inches in width when used as a means of egress for transient purposes or for open industrial structures where their use is approved by the Bureau.

613.3 Capacity. The capacity of a 36 inch wide fire escape stair shall not be greater than that for one unit of exit width for the applicable occupancy for stairs as listed in Table 605.1 and the capacity of a 24 inch fire escape stair shall not be greater than ½ of that permitted for one unit of exit width.

613.4 Screens. On buildings over three stories or 40 feet in height, screens shall be provided on all exposed sides of required fire escape stairs to a height of five feet, constructed of wire or other noncombustible weather resisting mesh having a maximum opening of 1½ inches. The top of the stair shall be protected with a hood or canopy of noncombustible material.

613.5 Access to Stair. Access from the interior of the building shall be provided at each story through a ¾ hour self-closing fire door having at least a ¾ hour fire resistance opening directly on the platform or balcony providing access to the fire escape stair.

613.6 Opening Protectives. Building openings below and within ten feet horizontally of the stair shall be protected with approved ¾ hour fire windows or fire doors conforming with Sec. 514.0.

613.7 Access to Street. All fire escape stairs shall be located so as to lead directly to a street or open space with direct access to a street or through an exit passageway at grade complying with Sec. 609.0.

613.8 Encroachment. In no case shall fire escape stairs project beyond the street lot line.

613.9 Construction. Fire escape stairs shall be constructed entirely of noncombustible materials as provided in Sec. 412.6 with handrails on both sides of stairs and platforms. Provisions shall be made for drainage of water, snow and ice.

Sec. 614.0 Class B Fire Escapes.

614.1 Secondary Means of Egress. As provided in 602.3, Class B fire escapes may serve as a secondary means of egress.

614.2 Location. When accepted as a required means of egress, fire escapes constructed on the front of existing buildings and projecting beyond the front lot line, shall have the lowest platform not less than 10 nor more than 12 feet above grade and shall be equipped with a counterbalance stair to the street and with a fixed ladder to the roof.

614.3 Construction. The fire escape shall be designed and constructed of noncombustible materials in accordance with accepted engineering practice.

Sec. 615.0 Ramps.

615.1 Substitution for Stairs. Ramps with a gradient of not more than one in ten may be substituted for stairs and shall comply with the applicable requirements for such required stairs except that larger gradients may be permitted in existing buildings and where specified in Article 7 but in no case greater than one in seven. Exit capacity of ramps per unit of exit width shall be as provided in Table 605.1. The ramp for all slopes exceeding one in ten and where the use involves the danger of slipping, shall be surfaced with approved non-slip materials.

615.2 Required Ramps. At least one exterior ramp with a slope not greater than 1 in 12, leading from grade to a building entrance, accessible at that level to elevators in buildings so equipped, shall be provided in accordance with 601.1.E in buildings in all occupancy groups except high hazard, or storage, where none of the street floor entrances provide access without steps at grade level.

Sec. 616.0 Escalators.

616.1 As Exits. Escalators of the horizontal non-slip tread type moving in the direction of egress may be an approved exit, when constructed in accordance with Sec. 1402.0. Escalators not moving in the direction of egress may be credited as required exits when they are connected to an automatic fire detection system that will cause them to stop upon the detection of fire. When

accepted as a required means of egress, escalators shall be enclosed as specified in 612.9.

616.2 CAPACITY. The capacity of escalators when accepted as exits shall conform to Table 616.2.

Table 616.2

	Minimum Width in Inches at		Units of
Tread	Balustrade (1)	Enclosure (2)	Exit Width
24	32	52	1½
40	48	68	2

Notes to Table

1. Measured 27 inches above front edge of tread.
2. Clear width above handrails.

616.3 WIDTH. The width of escalators shall be not less than as provided in 416.1 for the units of exit width provided.

616.4 LANDINGS AND PLATFORMS. Landings and platforms shall be provided at the top and bottom of each unit as required for interior stairs.

616.5 RAILINGS. Railings shall be of the balustrade type surmounted by moving handrails traveling at the same speed as the steps.

616.6 CONSTRUCTION. Approved escalators shall be constructed of noncombustible materials except for step wheels, handrails, electrical equipment, and wood veneers not more than $\frac{1}{28}$ inches thick directly attached to metal or other noncombustible backing with a nonflammable cement. The enclosure shall afford the fire resistance rating required for interior stairs as specified in Table 505.0. Vertical openings of escalators serving as non-required exits shall be protected as required by Sec. 511.0.

616.7 HEIGHT OF TRAVEL. No single escalator unit shall have a vertical travel of more than two stories nor more than 35 feet.

616.8 INCLINE. The maximum incline of an escalator shall not exceed 30 degrees from the horizontal and the step riser shall not exceed 8½ inches.

SEC. 617.0 ROOF ACCESS.

617.1 HOW PROVIDED. In buildings 4 stories or more in height with roofs having a slope of less than 20 degrees, access to the roof shall be provided by at least one stair or other vertical exit extending continuously from the street

floor to the roof, except that access to set back areas may be through a door or window from the same level, and opening to the roof. In buildings less than four stories in height with roofs having a slope of less than 20 degrees, access to the roof shall be provided by access scuttles and ladders.

617.2 ROOF ENCLOSURES. Stairs extending through roofs shall be enclosed in roof structures of fire resistive construction complying with 511.3.

SEC. 618.0 STORAGE AND INDUSTRIAL BUILDINGS OF UNLIMITED AREA.

618.1 WHEN PERMITTED. Storage and industrial buildings of unlimited area or storage and industrial buildings shown as unrestricted in area by Table 401.1 shall comply with 618.2 through 618.5.

618.2 TRAVEL DISTANCE. Egress by way of aisles at least 36 inches wide shall be provided from any point to a fire aisle and the travel distance to reach an exit to the outside by way of aisles or fire aisles shall conform to Note 3 of Table 606.1. Aisles shall be wide enough to care for their occupancy load based on the capacity from Table 605.1.

618.3 FIRE AISLES.

A. Fire aisles shall have a minimum width of 10 feet and shall run continuously and as straight as possible between openings in opposing walls. At least one continuous cross fire aisle shall be provided for each 400 feet of the length of the main aisle system. The cross aisles shall connect all fire aisles and provide access at each end to openings in the exterior, fire or division walls as the case may be.

B. Fire aisles shall lead to exits at each end which provide egress to grade, at least two of which remote from each other shall provide access for mobile fire fighting equipment.

C. Fire aisles shall not be obstructed and when used for the transportation of materials shall be provided with parking bays to permit loading and unloading outside the area of the aisles and without obstructing the aisle.

D. Fire aisles shall be posted at intervals of not less than 200 feet with approved signs and directional exit signs.

E. Positive markings shall identify the borders of fire aisles.

618.4 DOORS. At least two doors serving fire aisles shall be not less than 10 feet high and 10 feet wide to permit access of fire fighting equipment.

618.5 EMERGENCY LIGHTING. All exit signs, directional exit signs and exit lighting in fire aisles shall be provided with emergency lighting and shall comply with Sec. 903.0.

Sec. 619.0 Mercantile Buildings of Unlimited Area.

619.1 When Permitted. Mercantile buildings of unlimited area or mercantile buildings shown as unrestricted in area by Table 401.1 shall comply with 619.2 through 619.4.

619.2 Travel Distance. Egress by way of aisles shall be provided from any point directly to an exit providing egress to the outside within a travel distance which conforms to Note 3 of Table 606.1.

619.3 Aisles. Aisles shall comply with Sec. 608.0. Aisles shall be adequate in width for the occupant load they serve and those providing access to exits in both directions shall be not less than 44 inches wide. The total width of all aisles running parallel in either direction shall be at least equal to the required width of the exit doors toward which the aisles lead.

619.4 Emergency Lighting. All exit signs, directional exit signs and exit lighting in fire aisles shall be provided with emergency lighting and shall comply with Sec. 903.0.

Sec. 620.0 Exit Signs.

620.1 When Required. Exit signs shall be provided to indicate locations of means of egress in all buildings.

620.2 Location. An exit sign shall be clearly visible without obstructions in the line of sight from all places in spaces requiring exit signs.

620.3 Directional Exit Signs. Directional exit signs shall be placed to indicate the path of travel to an exit when it is not visible, or when changes in means of egress occur requiring a change in direction within an exit, or where necessary to avoid use of facilities which do not serve as exits to the outside, in which cases the Bureau may also require a sign reading "NOT AN EXIT."

620.4 Design. Exit signs shall be worded in legible block letters with the word EXIT for exit signs and with the word EXIT and an arrow indicating the direction to the exit for directional exit signs. Letters shall be at least 6 inches high except that for internally lighted signs the letters shall be at least 4½ inches high.

Sec. 621.0 Exit Lighting.

Means of egress shall be provided with artificial light as provided in Sec. 903.0.

ARTICLE 7

SPECIAL USE AND OCCUPANCY

Sec. 700.0 Scope.

This Article of the code shall apply to the construction, location and equipment of spaces, buildings or structures designed for special uses and occupancies. Such spaces, buildings or structures shall comply with all other applicable Articles of this code except as provided by this Article.

Sec. 701.0 Special Use and Occupancy.

701.1 Special Buildings and Structures. Special industrial or other use group buildings including among others but not limited to those listed in this Article may be constructed in accordance with the requirements of this Article. The Bureau may vary specific requirements of this code when not applicable and when consistent with reasonable structural, fire, and life safeguards considering the isolation of the building and the fire risk to and from adjoining property.

701.2 Hazardous Materials and Processes. Special provisions shall be made in the design of buildings which involve the storage, manufacturing, handling, or sale of flammable, combustible, explosive or hazardous materials, in accordance with the requirements of this Article.

Sec. 702.0 Exit Facilities for Special Use and Occupancy.

702.1 Compliance. The exit facilities of buildings or structures shall conform to Article 6, except as modified for special uses or occupancies.

702.2 Number of Exits. All rooms, spaces, classified in the hazardous use group, or in buildings or structures so classified, except toilet and similar rooms, shall be provided with not less than two exits and all exit doors from such spaces shall open outward in the direction of exit travel.

702.3 Hazardous Spaces. No means of egress shall traverse a hazardous area to reach an exterior exit.

702.4 Special Structures. Special structures, such as towers in chemical plants and refineries, and cupolas, which are unenclosed by walls, which provide access for the fire department at each working level and which are not

higher than the attainable height of the available fire equipment, may have only one exit provided the total travel distance horizontally and vertically from any occupiable point does not exceed 150 feet, the designed occupant load does not exceed 10, and the structure is of noncombustible construction.

Sec. 703.0 Ignition Sources in Hazardous Areas.

703.1 Heat Producing Appliances. Heat producing appliances shall be designed, installed and protected so as to safeguard against fire and explosion hazards in accordance with Chapter 121, Heat Producing Appliances and Air Conditioning Systems of Title 12, N.J.A.C.

703.2 Electric Wiring and Equipment. All electric wiring, fixtures and equipment including switch controls, motors and transformers shall be installed in accordance with Article 11.

703.3 Static Electricity. Provisions shall be taken to reduce the hazard from static electricity in accordance with accepted engineering practice.

703.4 Industrial Trucks. Industrial trucks propelled by electricity or internal combustion engines shall be permitted only when approved for use in accordance with Chapter 147, Industrial Trucks of Title 12, N.J.A.C.

703.5 Cutting and Welding. The operation of welding and cutting shall be conducted in hazardous areas only when adequate precautions and protection have been provided in accordance with Chapter 160, Welding and Cutting of Title 12, N.J.A.C.

703.6 Other Sources. Protection shall be taken to prevent other sources of ignition in hazardous areas in accordance with Chapter 161, Smoking of Title 12, N.J.A.C., and accepted engineering practice as applicable.

Sec. 704.0 Ventilation.

When a hazardous occupancy involving flammable or combustible liquid, gases, vapors or dusts involves a potential fire or explosion hazard, provision shall be made to vent the room, space or equipment in accordance with Chapter 122, Local Exhaust Systems of Title 12, N.J.A.C.

Sec. 705.0 Fire Fighting and Fire Extinguishing Equipment.

705.1 Hazardous Use or Processing. Buildings for hazardous use and processing shall be protected with automatic sprinkler systems or other fire extinguishing equipment in accordance with Article 13.

705.2 Effective Protection. Where the nature of the hazard is such that the application of water is not effective, other means of fire protection subject to the approval of the Bureau shall be provided.

Sec. 706.0 Separation of Hazardous Spaces.

Where practical, uses involving hazardous materials or processes shall be segregated in a separated one story building constructed of noncombustible materials, or separated from other uses by walls providing not less than 2 hours fire resistance rating. The Bureau may permit continuous use when it finds that the extent and nature of the use, or that the means of protection reduce the hazard so as to minimize the need for separation.

Sec. 707.0 High Hazard Locations.

No extreme high or high hazard use shall be located within 200 feet of a property classified as public assembly F-1, nor within any area classified as within the fire limits in accordance with Sec. 404.0.

Sec. 708.0 Explosion Relief Systems.

708.1 When Required. Explosion relief shall be provided in all occupancies using the following:

A. Flammable and combustible liquids when required by Sec. 711.0.

B. Combustible fibers which are readily ignitable and free burning such as cotton, sisal, henequen, ixtle, jute, hemp, tow, cocoa fiber, oakum, baled waste, baled waste paper, kapok, kay, straw, spanish moss, excelsior, certain synthetic fibers and other like materials.

C. Dusts which if mixed with air in the proper proportions become explosive and may be ignited by a flame or spark.

D. Blasting agents or fireworks.

E. Compressed gases.

708.2 Relief Devices. The methods employed to provide explosion relief shall be designed for automatic release under predetermined increases in pressure or the structure shall be designed against collapse in accordance with accepted engineering practice.

Sec. 709.0 Severe Fire Loads.

709.1 Definition. A severe fire load shall mean a space or structure containing combustible materials in excess of 400,000 Btu per square foot, or

combustible material piled to a height exceeding 15 feet, or stacked to a height exceeding 12 feet by means of clamps, pallets, racks or otherwise so as to provide a series of small chimneys or open spaces within the combustible material.

709.2 PROTECTION AGAINST FIRE. Severe fire loads shall be protected against fire as follows:

A. A two-source automatic sprinkler system shall be installed. Where a dry pipe system is installed, it shall be equipped with quick opening devices. No combustible material shall be piled or stacked higher than 3 feet below the sprinkler head deflectors. Noncombustible material shall not be piled or stacked higher than 18 inches below sprinkler head deflectors. The sprinkler system shall be connected to a central station.

B. Smoke and heat venting shall be provided.

C. Fire hose, standpipes and hydrants shall be provided.

D. Fire brigades shall be organized when the area exceeds the tabular area permitted in Table 401.1.

E. Combustible material shall not be piled or stacked in areas greater than those permitted for smoke and heat venting. These areas may be separated from each other by aisles located under the draft curtains. The aisles shall be at least as wide as ½ the height of the piled or stacked material.

SEC. 710.0 FLOOR AND WALL OPENINGS.

710.1 FLOOR OPENINGS. All floor openings, unless guarded by permanent enclosures or full height temporary barriers shall be guarded in accordance with accepted engineering practice.

710.2 WALL OPENINGS. All wall openings from which there is a drop of more than 4 feet shall be guarded in accordance with accepted engineering practice.

SEC. 711.0 FLAMMABLE AND COMBUSTIBLE LIQUIDS.

Flammable or combustible liquids stored, handled and used in buildings or structures, such as chemical plants, refineries, distilleries, service stations, dry cleaning plants, plants manufacturing organic coatings, spray finishing or dip tank operations shall comply with Chapter 133, Flammable and Combustible Liquids of Title 12, N.J.A.C.

SEC. 712.0 GASES.

Gases shall be stored, handled and used in accordance with accepted engineering practice; or Chapter 200, Liquefied Petroleum Gas of Title 12, N.J.A.C.; or Chapter 160, Welding and Cutting of Title 12, N.J.A.C. as applicable.

SEC. 713.0 EXPLOSIVES AND FIREWORKS.

Explosives and fireworks shall be stored, handled, used and transported in accordance with:

Chapter 191, The Transportation of Explosives of Title 12, N.J.A.C.

Chapter 192, The Storage of Explosives of Title 12, N.J.A.C.

Chapter 193, The Use of Explosives of Title 12, N.J.A.C.

Chapter 194, Rocket Experimentation by Amateurs of Title 12, N.J.A.C.

SEC. 714.0 CHEMICALS.

Chemicals shall be stored, handled or used in accordance with accepted engineering practice; or Chapter 132, Wet Nitrocellulose of Title 12, N.J.A.C. as applicable.

SEC. 715.0 DUST HAZARDS.

Dusts creating an explosion hazard shall be handled in accordance with accepted engineering practice.

SEC. 716.0 METALS AND METAL DUSTS.

Metals and metal dusts shall be stored, handled and used in accordance with accepted engineering practice.

SEC. 717.0 FIBERS.

Combustible fibers shall be stored in accordance with accepted engineering practice.

SEC. 718.0 GRAIN ELEVATORS.

718.1 CONSTRUCTION. All grain elevators and similar structures, except as provided in 718.3 shall be of Type 1, Type 2, or of laminated planks or lumber sizes qualified for Type 3-A construction within the height and area limits of high hazard uses of Table 401.1 except as provided in 718.2.

718.2 HEIGHT AND AREAS. When erected of 3 hour Type 1-A construction the height and area of grain elevators and similar structures shall be unlimited. When of Type 3-A construction, the structure may be erected to a height of 65 feet. In isolated areas the height of Type 3-A structures may be increased to 85 feet.

718.3 ACCEPTED ENGINEERING PRACTICE. Grain elevators and similar structures shall comply with accepted engineering practice.

SEC. 719.0 POWER HOUSES, FOUNDRIES, AND OTHER SIMILAR STRUCTURES.

719.1 EXEMPTIONS FROM HEIGHT AND AREAS. All buildings and structures designed to house special industrial processes, including among others the production and distribution of electric, gas or steam power, rolling mills, foundries, and requiring large areas and unusual heights to accommodate craneways or special machinery and equipment shall be exempt from the height and area limitations of Table 401.1.

719.2 AREA. Such buildings shall comply with 402.5 except as to height and when constructed of Types 2-A, 2-B and 2-C construction may have balconies and mezzanine floors which do not exceed ⅔ the area of the main floor in any one tier.

719.3 NONCOMBUSTIBLE MATERIAL. The enclosure walls when used of such buildings shall be constructed of approved noncombustible and weather resisting materials and when located with a horizontal separation of less than 30 feet from interior lot lines or any other building shall be protected or constructed to provide a fire resistance rating of not less than 2 hours.

719.4 FIRE PROTECTION. These buildings shall comply with Article 13 for auxiliary fire extinguishing equipment except that automatic sprinklers may be waived by the Bureau when such installations would be detrimental or dangerous to the specific use and occupancy, or when the fire load is not more than 24,000 Btu per square foot.

SEC. 720.0 RADIO AND TELEVISION TOWERS.

720.1 STRUCTURAL. All radio and television sending and receiving towers shall be designed to comply with Article 8 when over 20 feet in height above a roof or other support.

720.2 USE OF NONCOMBUSTIBLE MATERIAL. They shall be of noncombustible materials when located on the roof of a building. Free standing towers when located outside the fire limits may be built of timber construction complying with Type 3-A construction if less than 100 feet in height.

720.3 GROUNDING. All towers shall be grounded in accordance with accepted engineering practice.

SEC. 721.0 PIERS, WHARVES, AND MARINAS.

Piers, wharves and marinas shall be constructed and installed in accordance with accepted engineering practice.

SEC. 722.0 TUNNELS AND BRIDGES.

The construction of tunnels and bridges or other similar connections between buildings or parts of buildings shall be of noncombustible material or equivalent to the types of construction of the building having the highest allowable area. All openings into tunnels or enclosed bridges when connecting buildings shall be protected by self-closing fire doors and other permanent openings shall be firestopped.

SEC. 723.0 OPEN PARKING STRUCTURES.

723.1 WHEN PERMITTED. Open parking structures are those structures to be used for the parking or storage of passenger motor vehicles designed for carrying not more than 10 persons, and including the following two general types:

A. Ramp type parking structures are those employing a series of continuously rising floors or a series of interconnecting ramps between floors permitting the movement of passenger automobiles under their own power to and from the street level.

B. Mechanical type parking structures are those employing specially designed parking machines, elevators, lifts, conveyors, moving cranes, dollies or other devices for moving passenger automobiles to and from the street level.

723.2 EXTERIOR WALLS. The exterior shall be open on at least two sides at each tier for at least 50 percent of their area and so as to provide access for fire fighting. Walls closer than 11 feet to an interior property line or 20 feet to a building shall be without openings and provide not less than the fire resistance required by Table 505.0.

723.3 HEIGHT AND AREA LIMITATIONS. The height of the top deck or parking surface and the area per parking tier shall not exceed Table 723.3 except as provided in 402.1 and except that an open parking structure having not more than two tiers above grade shall not be limited in area. Any portion of an open parking structure extending below grade shall comply with Sec. 724.0.

Table 723.3

Construction Type	Allowable Height Feet	Allowable Area per Tier Square Feet
1-A	unlimited	unlimited
1-B	unlimited	unlimited
2-A	100 or 12 tiers + 1	50,000
2-B	100 or 12 tiers + 1	50,000
2-C	70 or 8 tiers + 1	30,000

723.4 Minimum Tier Height. The clear height between parking tiers shall be not less than 6 feet 6 inches.

723.5 Guards. Guards or railing of noncombustible materials at least 3 feet 6 inches high shall be provided at the periphery of all parking tiers, except where exterior walls are provided and around all interior tier openings. Noncombustible curbs or bumpers at least 8 inches high, substantially anchored and located so that no part of any motor vehicle will contact a wall, partition or railing shall also be provided. Guards, curbs and railings may be omitted where mechanical means is provided for parking vehicles when approved by the Bureau.

723.6 Floor Openings. A curb or ramp at least 6 inches high shall be provided at all interior floor openings. Floors of each tier shall be pitched to provide adequate drainage.

723.7 Exits for Manual Parking. Manual parking-open parking structures with manual parking shall be provided with one extra from each tier of parking, except that such structures having an area per floor in excess of 3,000 square feet shall be provided with at least two exits from each tier. When two exits are required not more than 50 percent of the required exit capacity may be provided by the ramps used by motor vehicles, when serving not more than one level below grade. A ramp when used as a required exit shall be credited with not more than 2 units of exit width. Exit stairs shall have a minimum width of 36 inches and may be unenclosed, except that they shall be enclosed in at least 2 hour fire resistant construction when the top riser is more than 30 feet from one of the open exterior walls. No point on any tier of parking shall be more than 100 feet from an exit.

723.8 Exits for Mechanical Parking. Open parking structures with mechanical parking equipment shall be provided with at least one exit from each tier of parking. Such exits may be unenclosed but shall be not less than 36 inches wide and not more than 200 feet from any point on any tier.

723.9 Ramps. Ramps used for movement of motor vehicles and as required exits need not be enclosed when serving tiers above grade. Such ramps shall have a gradient not exceeding 1 in 7 with nonslip surfaces. A landing having a minimum dimension of 20 feet in length shall be provided at the discharge point of all ramps at the street level, within the street line. Where a ramp is also used for the parking of motor vehicles, it shall be considered as a parking tier and may not serve as an exit for the occupants of the structure.

723.10 Hoistway Enclosures. Hoistways for elevators and lifts shall be enclosed with noncombustible materials or with screening having a mesh not greater than ½ inch.

723.11 Motor Fuel Pumps. Motor fuel pumps and facilities may be provided on the street floor level only and shall be located not closer than 20 feet from a ramp or other vertical opening. No pedestrian exit from any parking area shall have a path of travel through any fuel dispensing area.

723.12 Occupancy Separations. Areas used for office, waiting and for dispensing fuel shall be separated from parking areas on the same level by noncombustible partitions having a fire resistance of at least ¾ hours. Open parking structures when part of another occupancy shall be separated from that occupancy by construction providing at least 2 hours fire resistance.

723.13 Standpipes. Open parking structures having an area in excess of 3,000 square feet on any tier shall be provided with standpipes.

Sec. 724.0 Garages Other than Small Parking Garages.

724.1 Classification. Garages used for parking motor vehicles other than small parking garages shall be classified as follows:

A. Class 1 garage shall include buildings or spaces used for parking of vehicles having fuel storage tanks in excess of 26 gallons capacity; or for parking vehicles of any size which are combined with an area in which mechanical repair, body work or painting of vehicles is conducted. Class 1 garages shall be classified as moderate hazard storage.

B. Class 2 garage shall include buildings or spaces used for parking vehicles having fuel storage tanks of 26 gallon capacity or less in which fuel and oil may be dispensed but in which no repair, body work or painting of vehicles is conducted. Class 2 garages shall be classified as low hazard storage.

724.2 Height and Area. The heights and areas of public garages shall conform to Table 401.1. Each story shall have a minimum clear height of 8 feet.

724.3 CONSTRUCTION.

A. Structures over 1 story in height shall be of noncombustible or fire-resistive construction.

B. Floors at grade or street level when over basements shall provide a fire resistance rating of not less than 2 hours.

C. Floor finish of floors shall be constructed of approved, non-absorbent, water-resistant, vapor resistant, noncombustible material.

D. Floors shall provide adequate drainage.

724.4 ROOF PARKING. Parking on the roof may be permitted in Type 2 construction buildings provided:

A. The roof is constructed to provide a fire resistance rating of not less than 2 hours.

B. The floor is protected by guards, railings and curbs as required for open parking structures.

C. The roof is considered as a story or its equivalent in height in determining the permitted height according to Table 401.1.

D. Exits serving the roof are enclosed in bulkheads of 2 hours fire resistant construction equipped with self-closing doors.

E. Ramps are enclosed as required in 723.9.

724.5 OCCUPANCY SEPARATIONS.

A. Parking areas in moderate hazard occupancies shall be separated from repair, body work or spray painting areas, from fuel dispensing areas, and from areas used for sales and office purposes, and each area shall be separated from the other when the area exceeds 1,000 square feet, by noncombustible walls having a fire resistance of not less than 2 hours.

B. Parking areas in low hazard occupancies shall be separated from fuel-dispensing, sales, or office areas by noncombustible walls providing not less than ¾ hour fire resistance.

C. When parking garages are part of another occupancy, they shall be separated by construction providing not less than 2 hour fire resistance. All openings in walls separating occupancies shall be protected by self-closing doors.

D. Fuel and motor-oil dispensing areas shall not be located on any floor other than at street level and no fuel pump shall be located closer than 20 feet to a ramp or other vertical opening or shaft.

E. Repair, body work or paint spraying areas shall not be located in any area below grade. Repair areas shall comply with the requirements for motor vehicle repair shops.

724.6 EXITS. Exits from parking garages shall meet the requirements for open parking structures except that all exit stairs shall be enclosed by 2 hour fire resistant construction and provide protected ways to the exterior at the street floor. Ramps when enclosed may serve as required exits under the same requirements as for open parking structures. In garages protected by sprinkler systems, the travel distance from the most remote point to an exit on each floor may be increased to 150 feet.

724.7 RAMPS. Ramps used for the movement of motor vehicles or as required exits shall be enclosed at each floor level and at the roof by construction providing not less than 2 hour fire resistance. Except in garages provided with a complete sprinkler system, ramp openings at each floor level shall be protected by a water spray provided by deluge type sprinkler heads supplied with water at a rate of 3 gallons per minute per linear foot of opening and where a continuous ramp parking type structure is provided a water spray shall be provided at least once in each complete revolution. Ramps shall have a gradient not in excess of 1 in 7, with non-slip surface. A landing, having a minimum length of 20 feet shall be provided at the discharge point of all ramps at the street level, within the street property line.

724.8 HOISTWAY ENCLOSURES. Hoistways for elevators or lifts shall be enclosed in shafts of noncombustible construction having a fire-resistance rating of not less than 2 hours.

724.9 SPRINKLER PROTECTION. An automatic sprinkler system shall be provided in parking garages as follows:

A. In below grade levels exceeding 5,000 square feet in area.

B. In multi-story garages exceeding in moderate hazard occupancies 22,000 square feet per floor or exceeding 100 percent of the floor area permitted when limited by Table 401.1.

C. In multi-story parking garages exceeding the height at which available local equipment can effectively provide fire protection when the area per floor exceeds 12,000 square feet or 50 percent of the area permitted for the type of construction by Table 401.1.

D. All fuel dispensing areas shall be provided with fire extinguishers suitable for use on flammable liquids.

E. Standpipes shall be provided in garages over 3 stories in height having an area in excess of 10,000 square feet which are not required to

be protected by automatic sprinklers. Standpipes shall be provided with 1½ inch hose connections equipped with approved small fire hose.

724.10 VENTILATION. Ventilation shall be provided in accordance with Chapter 122, Local Exhaust Systems of Title 12, N.J.A.C.

724.11 HEATING APPLIANCES. Open flame heating appliances, other than approved listed unit heaters safely located from collision damage, shall be located in a room or space used for no other purpose and separated from the garage by noncombustible construction having a fire resistance rating of not less than 2 hours. Only smoke tight pipe and duct openings shall be permitted in such construction.

724.12 EXISTING GARAGES. All existing buildings and structures altered or converted for use to a garage, motor vehicle repair shop or gasoline service station, more than one story in height, unless of Type 1 construction, or Type 3-A construction, shall have the partitions, columns and girders and all floor and roof construction protected and insulated with noncombustible materials or assemblies of component materials having a fire resistance rating of not less than ¾ hours; except that existing roof trusses shall be exempt from all fire-proofing requirements.

SEC. 725.0 SMALL PARKING GARAGES.

725.1 CLASSIFICATION. Small parking garages are those which do not exceed one story or 1,000 square feet in area, do not have space for more than four motor vehicles, none of which have storage tanks holding more than 26 gallons each and which are not used for the repair or servicing of motor vehicles. They shall be considered a low hazard storage occupancy.

725.2 OCCUPANCY SEPARATION. Small parking garages shall not be located within or attached to a building used for any other occupancy unless separated by construction designed to restrict the passage of gases, smoke or odor from the garage to the other occupancy and complying with Table 505.0 for the construction type and providing not less than ¾ hour fire resistance rating.

725.3 OPENINGS. Openings in the construction shall comply with Article 5 except that no openings from garages shall be permitted into occupied space.

725.4 EXITS. At least one swinging door shall be provided as a means of egress to the exterior from each small parking garage and no garage shall be used as a means of egress from any area above or below it.

SEC. 726.0 MOTOR VEHICLE REPAIR SHOPS.

726.1 CLASSIFICATION. Buildings and spaces used for repair of motor vehicles, for body work or for painting motor vehicles shall be classified as industrial use group. This use shall be permitted in a separate building, or in the same building with office and sales display spaces for motor vehicles. It may also be combined with a public parking garage and when so combined both shall be classified as an industrial occupancy.

726.2 OCCUPANCY SEPARATION. The repair body work or painting facilities shall be separated from the other uses and each from the other by construction providing at least 2 hour fire resistance. When in building with other occupancies than permitted in 726.1, they shall be separated with walls providing 2 hours fire resistance without openings other than through vestibules.

726.3 LOCATIONS. Motor vehicle repair shops shall not be located on levels below grade.

726.4 FLAMMABLE AND COMBUSTIBLE LIQUIDS. Flammable and combustible liquids shall be stored in accordance with Sec. 711.0.

726.5 VENTILATION. Repair shops shall be ventilated as provided in Chapter 122, Local Exhaust Systems of Title 12, N.J.A.C. In addition where internal combustion engines are tested in running condition, each motor shall be provided with a positive means of venting or exhausting the products of combustion to the outside. Repair pits which shall not be permitted in floors below the first or grade level, shall also be vented or exhausted positively at times when in use.

726.6 FLOORS. Floors shall be of noncombustible, nonabsorbent, water-resistant and vapor resistant material.

726.7 DRAINAGE. Floors shall provide adequate drainage, through oil separators or traps to avoid accumulation of explosive vapors in building drains or sewers.

726.8 HEATING APPLIANCES. Open flame heating appliances other than approved unit heaters safely located from collision damage, shall be located in a room or space used for no other purpose and separated from the repair shop by noncombustible construction having a fire resistance of not less than 2 hours.

726.9 SPRINKLERS. Automatic sprinklers shall be provided in repair shops under the following conditions:

A. Repair shops over one story in height or located beneath another occupancy, exceeding an area on any one floor of 10,000 square feet if of Type 1 construction; 8,000 square feet if of Type 2 construction; or 6,000 square feet if of Types 3 or 4 construction.

B. Repair shops exceeding an area of 15,000 square feet if of Type 1 construction; 12,000 square feet if of Type 2 construction; 9,000 square feet if of Type 3 construction; or 6,000 square feet if of Type 4 construction.

Sec. 727.0 Aircraft Hangars.

Aircraft hangers shall conform to accepted engineering practice.

Sec. 728.0 Places of Assembly, Theaters, and Motion Picture Theaters.

Places of assembly, theaters, and motion picture theaters shall conform to accepted engineering practice.

Sec. 729.0 Places of Assembly not Otherwise Covered.

729.1 General. Other places of public assembly including auditoriums, armories, bowling alleys, broadcasting studios, chapels, churches, community houses, dance halls, gymnasiums, lecture halls, exhibition halls, museums, nightclubs, rinks, roof gardens and similar uses shall comply with the general exit requirements of Article 6, and the applicable requirements of 728.0. Such places which are equipped with a stage, movable scenery, scenery loft, and dressing rooms shall comply with Sec. 728.0.

729.2 Aisles with Fixed Seats. All rows of seats shall be individually fixed or fixed in rigid units between longitudinal aisles complying with Sec. 728.0 and Article 6. Where permitted, continuous fixed benches, folding and telescopic seats shall comply with 730.8.

729.3 Aisles without Fixed Seats. Tables and chairs in all rooms and spaces for places of assembly shall provide convenient access by unobstructed aisles not less than 36 inches wide which lead to required exitways complying with Article 6.

729.4 Kitchen and Service Pantries. Where kitchen and service pantries are provided, they shall be separately enclosed in partitions, floors and ceilings having a fire resistance rating of not less than 2 hours and no required exit shall pass through such areas.

Sec. 730.0 Stadiums and Grandstands.

730.1 Accessibility to Public Ways. All stadium and grandstands shall have at all times ample and unrestricted access to public ways of approach from at least two points, remote from each other. An available park, field or open space approved as an area of refuge may be used in lieu of one means of access to a public way.

730.2 Occupancy Load of Grandstands. The occupancy of a grandstand or other structure for outdoor assembly shall be computed on the basis of the

number of fixed seats plus an allowance of one individual for each 6 square feet of floor or ground area used for standing space or movable seats. Such spaces shall not include the area of required exits; nor shall any aisle or other space used as an exit be used for standing room or seats. The occupancy load shall not exceed the capacity of exits as required herein or by the provisions of Article 6.

730.3 Location of Grandstands.

A. Street Frontage. Every stadium or grandstand shall have one or more frontages on streets, highways or other open public spaces, not less than 30 feet in width leading to a street as provided in Table 730.3.

Table 730.3

Occupancy Load	Street Frontage
1,000 or less	1 street
1,001 thru 5,000	2 streets
5,001 thru 10,000	3 streets
Over 10,000	4 streets

B. Fire Separation. No wood frame grandstand construction shall be located nearer than 20 feet to an interior lot line or other frame structure, unless provided with a protected exterior having a fire resistance rating of not less than ¾ hours or separated from adjacent units of frame construction with a wall having a fire resistance rating of not less than 2 hours.

730.4 Type of Construction.

A. Frame Construction. No frame grandstand unit or similar structure shall be more than 10,000 square feet in area, nor more than 20 feet in height to the highest level of seat platforms nor more than 200 feet in length; except that when fire-retardant lumber is used, the allowable area and length may be increased 100 percent. Not more than three such units shall be constructed in any one group, except that when more than one such group is erected, they shall be separated by a wall having a fire resistance rating of not less than 2 hours when the fire separation is less than 50 feet.

B. Noncombustible Construction. All grandstand structures, 2 or more tiers in height shall be of at least Type 2-C or 3-A construction.

730.5 Design. All grandstand and similar structures shall be designed for wind load of not less than 30 pounds per square foot on the vertical projection in all directions; and for the live loads and swaying loads as specified in Article 8.

730.6 Means of Egress from Grandstands.

A. Occupancy Load. All means of egress shall comply with the requirements and occupancy loads of Article 6 for places of assembly.

B. Location of Exits. The distance between exits in the grandstand shall not exceed 100 feet, except that only one exit shall be required when the length of a cross aisle does not exceed 50 feet.

C. Number of Exits. Every stair, ramp, or vomitory shall lead directly to an exterior exit or to a horizontal exit passageway leading to a field or other open space, or to an exit gate to the street. The number of exit gates shall comply with Table 730.6.A.

Table 730.6.A

Occupancy Load	Number of Exits
1,000	2
3,000	3
Each additional 3,000	1 additional

D. Exit Signs. Illuminated exit and directional signs shall be provided in accordance with Articles 6 and 9.

730.7 Aisles.

A. Width of Aisles. Aisles shall be not less than 24 inches in width when serving not more than 60 individuals and not less than 36 inches in width when serving more than 60 individuals. When aisles are divided by a column or other obstruction, a minimum width of 22 inches shall be left on each side.

B. Steps. When the entrance to an aisle is located above the ground level, a ramp or stair shall be provided complying with Article 6 not less than the width of the aisle. When the gradient of ramps exceeds one in 10, steps may be provided to overcome the difference in level. When the rise of seating platforms is more than 11 inches, an intermediate step shall be provided with equal risers; and when more than 18 inches, 2 intermediate steps shall be provided with equal risers.

C. Rails. Every ramp, stair, deck and tier shall have an approved protective railing or guard not less than 3 feet 6 inches high on all open sides when 3 feet or more above grade level or above any other level occupied by the public. Front railings of grandstands when the foot rest is more than 2 feet above the ground shall be not less than 33 inches high.

D. Strength of Rails. Railings or guards shall be designed to comply with Article 8.

E. Spaces Underneath Seats. Spaces underneath grandstand seats shall be kept free of all combustible and flammable materials and shall not be occupied or used for other than exit; except that when enclosed by construction having a fire resistance rating of not less than ¾ hours, the Bureau may approve the use of such spaces for other purposes that do not endanger the safety of the public.

730.8 Seats.

A. Number of Seats. No seat shall have more than 16 seats between it and the nearest aisle nor shall the distance back to back of seats with back rests be less than 30 inches, nor less than 22 inches for the bleacher type seats.

B. Width of Seats. The minimum width of fixed seats with arms shall be 20 inches; and without divisions between seats, a minimum width of 18 inches shall be provided for each person. No portable chairs or seats shall be permitted, except in boxes or loges in which one chair may be installed for each 5 square feet of floor area and not more than a total of 16 seats in a box.

C. Ceiling Clearance. The clear height below ceilings in any exit shall be not less than 8 feet and below trusses, beams, girders and all other framing over occupiable spaces not less than 6⅔ feet.

730.9 Temporary Stadiums of Combustible Construction. Temporary and portable stadiums and grandstands of combustible construction and such permanent structures outside the fire limits shall not exceed 20 feet in height above the grade, and the frames, stringers, and sleepers shall be rigidly secured and anchored with through bolts, ring connectors, rivets, lag screws or other approved connectors to resist all stresses and prevent displacement during occupancy. The occupancy load of each structure shall be not more than 1,000.

730.10 Parking Spaces. Parking spaces shall be located not less than 20 feet from grandstand structures, unless provided with a fire division having a fire resistance rating of not less than 2 hours on the side facing the parking.

730.11 Electrical Installations.

A. Compliance. Electrical installations shall conform to Article 11.

B. Installation and Inspection. The electrical system shall be installed, maintained and operated in a safe and workmanlike manner. If portable, it shall be inspected daily when in use by a qualified person representing the owner and any defects found shall be corrected before the public is admitted to the show or performance involved.

C. Protection to Public. The electrical system and equipment shall be isolated from the public by proper elevation or guarding, and all electrical fuses and switches shall be enclosed in approved enclosures. Cables on the ground in areas traversed by the public shall be placed in trenches or protected by approved covers.

730.12 Flammable Liquids and Gases. No storage or handling of flammable liquids or gases shall be permitted at any location at which it would jeopardize egress from the structure. Refueling of equipment with flammable liquids shall be permitted only with safety containers.

730.13 Fire Extinguishing Equipment. Fire extinguishing equipment of approved types shall be furnished by the person operating, conducting, or promoting any place of outdoor assembly in such amount and in such locations as may be directed by the Bureau. Such fire extinguishing equipment shall be maintained in good working order and shall be operated by employees of such places of outdoor assembly who shall be properly trained for the purpose, and who shall be required to exhibit their skill. This equipment shall be maintained in such locations as may be directed by the Bureau, who may also direct the installation of such additional fire extinguishing equipment as appropriate.

730.14 Sanitation. Sanitary facilities shall comply with Article 12.

Sec. 731.0 Tents and Grandstands Used as Places of Assembly.

731.1 Location.

A. Outside of fire limits temporary tents may be erected for a period not to exceed 30 days for religious, educational or recreational purposes.

B. No tent or tents shall be erected to cover more than 75 percent of premises; nor shall any tent be erected closer than 10 feet to other structures or interior lot lines except as hereinafter provided. Stake lines of adjacent tents shall be sufficiently distant from each other to provide an area to be used as a means of emergency egress.

C. Concession or other tents not occupied by the public need not be separated from each other and may be erected less than 10 feet from other structures only if the Bureau deems such closer spacing safe from hazard to the public.

D. Tents, each not exceeding 1,200 square feet in ground area, located on fair grounds or similar open spaces need not be separated from each other, provided safety precautions meeting the approval of the Bureau are taken.

731.2 Structural.

A. All supporting members shall be of sufficient size and strength to support the structure.

B. Tents shall be adequately guyed, supported and braced to withstand a wind pressure or suction of 10 pounds per square foot. The poles and their supporting guys, stays, stakes, and fastenings shall be of sufficient strength and attached so as to resist wind pressure of 20 pounds per square foot of projected area of the tent. Tent poles shall be stayed with wire ropes. Fiber rope shall be used only for mooring to stakes.

731.3 Flame Resistance.

A. All tents occupied for assembly, or in which animals are stabled, or those located within that portion of the premises used by the public; and all tents in places of outdoor assembly in or about which any devices using fuels are operated, and all tarpaulins and decorative materials in connection with any of these, shall meet the requirements for resistance to fire in accordance with accepted engineering practice, except that decorative materials for indoor use need not be accelerated weathering. Safety nets shall be exempt from the above requirements for resistance to fire.

B. The Bureau shall make field tests in accordance with approved methods, or require a certificate or other evidence of approval by a nationally recognized testing agency, or accept the report of tests made by other administrative officials as evidence that the tents, tarpaulins and decorations have the required resistance to fire.

731.4 Means of Egress.

A. Exits. Not less than 22 inches exit width shall be provided for each 500 square feet of public space enclosed, with a minimum width of exit of 44 inches and the line of travel to an exit not to exceed 150 feet.

B. Aisles and Passageways. Aisles and passageways shall conform to Sec. 730.0. All exitways shall be maintained free and unobstructed at all times during occupancy of the tent.

731.5 Fire Protection.

A. The ground enclosed by any tent used in connection with a place of outdoor assembly, and for a reasonable distance but not less than 10 feet outside of such structure or structures, shall be cleared of all flammable material or vegetation which will carry fire. This work shall be accomplished to the satisfaction of the Bureau prior to the

erection of such structure or structures. The premises shall be kept free from such flammable materials during the period for which the premises are used by the public.

B. No hay, straw, shavings or similar combustible materials other than that necessary for the current feeding and care of animals shall be permitted within any tent used for public assembly, except that sawdust and shavings may be used if kept damp.

C. No smoking, fireworks, or unapproved open flame of any kind shall be permitted in any tent while occupied by the public. "No smoking" signs shall be conspicuously posted in any tent open to the public.

D. Tents shall not be used for the display of motion pictures unless safety film is used.

731.6 ACCEPTED ENGINEERING PRACTICE. Tents and grandstands shall also comply with accepted engineering practice.

SEC. 732.0 AIR SUPPORTED STRUCTURES.

732.1 USE. Air supported structures shall be restricted to low or medium hazard storage and no personnel shall be assigned to the occupancy.

732.2 SEPARATION. A separation of 30 feet from property lines and all other buildings on the same property shall be provided.

732.3 AREA. The maximum area of the air supported structure shall be in accordance with Table 732.3.

Table 732.3

STORAGE TYPE	FIRE LOAD Btu/Sq. Ft.	AREA Sq. Ft.
Low Hazard	Less than 24,000	15,000
Medium Hazard	Less than 80,000	8,750

732.4 MATERIALS. The air supported material shall be as required by accepted engineering practice with a two-second flame out.

732.5 EXITS.

A. For structures with an area of 1,500 square feet or less, at least one exit with door not less than 36 inches and not more than 44 inches in width shall be provided.

B. For structures with an area over 15,000 square feet, at least two exits with doors at least 36 inches and not more than 44 inches in width shall be provided. Exits shall be remote from each other.

C. The maximum travel distance to an exit by means of aisles as normally used for egress purposes shall be not less than 75 feet.

732.6 ENGINES AND EQUIPMENT.

A. No combustion engine equipment except industrial trucks shall be permitted in air supported structures.

B. Compressors and motors used to support the structure shall not be permitted inside the air supported structure.

732.7 HANGING LOADS. No hanging loads shall be permitted.

SEC. 733.0 DRIVE-IN MOTION PICTURE THEATERS.

733.1 ARRANGEMENT OF LANES. Separate entrance and exit lanes shall be provided not less than 12 feet in width, with not less than 40 feet intervals between access lanes. The parking space for each car shall be not less than 9 feet by 20 feet in area, and so arranged to provide continuous lanes of travel.

733.2 PROJECTION BOOTH. The projection booth shall be supported on a structure of Type 2-C construction or other approved noncombustible construction. No motor vehicle shall be permitted to park within 20 feet of the projection booth or room.

733.3 SCREEN TOWER. The screen tower shall be designed by utilizing the allowable fiber stresses and wind loads specified in Article 8.

733.4 TOILET FACILITIES. Separate toilet facilities shall be provided for each sex as required by Article 12.

733.5 FIRE PROTECTION. Sufficient approved portable fire extinguishers shall be provided in readily accessible locations, plainly and visibly identified by signs at distances of not more than 150 feet so as to be available to every motor vehicle. The fire extinguishers shall be mounted on posts or platforms protected from mechanical damage with substantial guards.

SEC. 734.0 AMUSEMENT PARKS.

734.1 CONSTRUCTION. All buildings and enclosed structures shall be constructed to conform to this code governing the particular use and occupancy involved and in compliance with the fire limit limitations of Article 4.

734.2 AMUSEMENT DEVICES. The maximum height of any amusement device in which passengers are transported shall not exceed 100 feet in fire resistive construction, 80 feet in unprotected steel and 40 feet in frame construction.

734.3 Amusement Park Buildings. All amusement park buildings over one story in height and one story buildings over 1,500 square feet in area shall have walls, floors, roofs, and supports constructed of material having a fire resistance rating of not less than ¾ hours.

734.4 Proximity to Lot Lines. All structures located within 20 feet of lot lines or within 20 feet of other structures on the same lot shall be protected with at least Type 2-B construction.

734.5 Walkways and Ramps. Walkways and ramps shall be erected with a slope not greater than one in 10, except when approved non-slip surfaces are provided the grade may be increased to a maximum of one in eight.

734.6 Elevating and Conveying Equipment. All devices and equipment for transporting persons shall comply with Article 14.

734.7 Tests. All amusement devices used by the public which embrace hazardous features shall be installed and operated as directed by the Bureau and shall not be placed in service until acceptance tests have proven satisfactory.

734.8 Fire Protection. In addition to the fire-extinguishing and fire-fighting equipment required by the use and occupancy of each building and structure, every amusement and exhibition park, when required by the Bureau, shall be provided with a system of fire hydrants and fire lines with the required water supply, in accordance with Article 13.

Sec. 735.0 Loading Docks.

735.1 Construction. Exterior walls separating loading docks from buildings shall provide the fire resistance required for the type of construction in accordance with Table 505.0. Roofs over such docks shall be constructed of noncombustible materials. When the dock is recessed into a multi-story structure, the walls and the ceiling and floor construction over it shall provide not less than 2 hour fire resistance rating.

735.2 Unenclosed Dock. When a loading dock or loading area entirely within a structure accommodates not more than 4 cars or vehicles at any one time, and either the combustible content of the loading dock of the loading area is less than 24,000 Btu per square foot, and the loading dock or loading area is adequately protected by automatic sprinklers, the loading dock or area may be unenclosed.

735.3 Bumper Guards. Truck loading docks shall be equipped with bumpers which extend 14 inches beyond the face of the building wall.

Sec. 736.0 Shipping and Receiving Rooms.

Every shipping and receiving room located on or below a floor occupied for mercantile uses shall be cut off by fire divisions of not less than the fire resistance of the type of construction of the building but in no case less than ¾ hours. Direct access to the street from the shipping and receiving room shall be provided.

Sec. 737.0 Operation and Maintenance.

Buildings and spaces involving the use of hazardous materials in any of the operations performed shall conform with the requirements of this code by regularly checking the operation, equipment and general fire safety conditions and by formulating proper fire fighting procedures in the event of fire. Proper maintenance shall be provided by safe arrangement and storage of contents; proper segregation of hazardous processes; handling of volatile flammables; avoidance of dangerous congestion and maintenance of required exits clear of obstruction. All places of assembly while open to the public shall comply with safety regulations concerning combustible scenery and hazardous equipment when they are in use.

ARTICLE 8

STRUCTURAL REQUIREMENTS

SEC. 800.0 SCOPE.

This Article of the code shall govern the structural design of all buildings and structures and their foundations and the quality, workmanship, and requirements for all materials and methods of construction.

SEC. 801.0 GENERAL.

801.1 STRUCTURAL. All structures and their component parts shall be designed and constructed so as to be capable of sustaining safely all superimposed live and special loads to which they may be subjected in addition to their own dead load but in no case less than the design load of Sec. 803.0.

801.2 PROTECTION FROM DETERIORATION. Where structural material or assemblies may deteriorate and become structurally unsound under the proposed condition of use, approved protection shall be provided to prevent such deterioration.

801.3 STABILITY. All structures shall be constructed and integrated so that loads are transmitted to the ground without unsafe deformation or movement, including uplift and overturning of the structure or any structural part.

801.4 DRAINAGE. Portions of structures erected on soil, which is not adequately drained and is water-bearing at any season of the year, shall be constructed so as to prevent ground water from entering into basements, cellars and habitable spaces.

SEC. 802.0 STRUCTURAL DESIGN PROCEDURES.

802.1 DESIGN CRITERIA. In addition to dead loads, all buildings and other structures shall be capable of sustaining the minimum design live, snow and wind loads.

802.2 STRUCTURAL ANALYSIS.

A. Approved Engineering Analysis. The capability of any structural member, assembly, or system of construction to safely sustain dead loads and design loads shall be determined by approved engineering analysis to establish that stresses in all component structural materials will not exceed the safe working stresses.

B. Accepted Engineering Practice. Except where specifically covered in this Article, compliance with the accepted engineering practice shall be deemed to comply with this Article.

C. Computer Analysis. Substantiation of design by computer analysis shall be subject to the need for sufficient sample computations to ascertain the use of a program conforming with all the structural requirements of this Article.

D. Specific Requirements. The design procedure shall comply with accepted engineering practice.

802.3 WORKING STRESSES. Safe working stresses for use in design shall be accepted engineering practice for the various construction materials except as provided in 802.3.A, 802.3.B, and 802.3.C.

A. Ordinary Materials. The allowable working stresses for structural materials, which are used without the Controlled Material Procedure, but which are properly identified as to manufacture and stress grade, shall not exceed the lowest stress grade of the specific material of the accepted engineering practice.

B. Unidentified or Ungraded Material. The use of unidentified or ungraded materials shall be limited to non-structural elements, except when submitted under certification by inspection of the professional of record, or they may be graded by recovery and test of representative samples as prescribed in this Article.

C. Used Materials. Used materials shall be limited to non-structural elements, except when submitted under certification by inspection of the professional of record with proper allowance for the condition of the material.

D. Controlled Materials. The working stresses for structural materials used under the Controlled Material Procedure shall not exceed the maximum stresses specified by accepted engineering practice. See Sec. 111.0.

802.4 TEST SAFE LOAD. When not capable of design by approved engineering analysis, any system of construction or structural unit and its connections shall meet the performance criteria specified in this Article in accordance with the test procedures prescribed herein.

802.5 MATERIAL STANDARDS. All building materials used shall comply with accepted engineering practice.

SEC. 803.0 DESIGN LOADS.

803.1 LIVE AND DEAD LOADS. The live loads to be assumed in the design of buildings and structures shall be the greatest load produced by the intended

Table 803.1 Minimum Uniformly Distributed Live Loads

Occupancy or Use	Live Load Lbs. per Sq. Ft.
Armories and drill rooms	150
Assembly halls and other places of assembly	
Fixed seats	60
Movable seats	100
Balcony (exterior)	100
Bowling alleys, pool rooms and similar recreational areas	75
Catwalks (see walking platforms and working platforms)	
Cornices	75
Corridors (other than those specifically designated)	80
Dance halls	100
Dining rooms and restaurants	100
Garages	
Passenger cars	50
Unloaded buses and light trucks	125
Loaded trucks, buses and trucking space (floors shall be designed to carry 150% of the maximum wheel load anywhere on the floor)	200
Gymnasiums, main floors and balconies	100
Laboratories	100
Manufacturing	125
Marquee	75
Reviewing stands and bleachers	100
Roofs (see Sec. 804.0 and 805.0)	
Sidewalks, vehicular driveways and yards	250
Skating rinks	100
Stairs, fire escapes and exitways	100
Storage warehouse, light	125
Storage warehouse, heavy	250
Stores	
Retail stores and shops for light merchandise	
Grade floor	100
Upper floor	75
Wholesale stores and shops	125
Theaters	
Aisles, corridors and lobbies	100
Orchestra and balcony floors	60
Stage floors	150
Walking platforms	50
Working platforms	80
Yards and terraces, pedestrian	100

use and occupancy, but in no case less than the minimum uniformly distributed live loads of Table 803.1. The plans for all buildings and structures shall include a detailed breakdown of the live and dead loads for which each floor or part thereof has been designed.

803.2 Loads Not Specified. The Bureau shall determine the required live load for any use not provided for in Table 803.1.

803.3 Partition Loads. In office buildings and other buildings in which subdividing partitions may be subsequently erected, rearranged or relocated, provision shall be made to support the actual weight of such partitions where they occur or for an equivalent uniform load, which shall be assumed to be not less than 20 pounds per square foot of floor area in addition to the specified uniformly distributed live loads.

803.4 Concentrated Loads. Floors of buildings shall be designed to support the uniformly distributed live loads specified in Table 803.1 or the concentrated loads of Table 803.4, whichever produce the greater stresses. Unless otherwise specified, the indicated concentration shall be assumed to occupy an area of 2½ feet square, and shall be so located as to produce the maximum stress conditions in the structural members. Actual concentrated loads that are physically applied to the structure shall include rational designed procedures based on actual application of the load.

Table 803.4
Concentrated Loads

Location	Pounds
Driveways and sidewalks over areaways and basements	12,000
Elevator machine room grating (on area of 4 sq. in.)	300
Finish light floor plate construction (on area of 1 sq. in.)	200
Garages, pleasure cars	2,500
Garages, vehicles not exceeding 8,000 lbs. gross weight	4,000
Garages, vehicles not exceeding 20,000 lbs. gross weight	8,000
Garages, vehicles exceeding 20,000 lbs. gross weight	12,000
Office floors	2,000
Road surfaces	300
Scuttles and skylight ribs	200
Sidewalks	8,000
Stair treads (on center of tread)	300

803.5 Impact Loads. The specified unit live loads indicated in Table 803.1 may be assumed to include adequate allowance for ordinary impact conditions. Special provision shall be made in the structural design for the impact induced by the equipment indicated in Table 803.5.

Table 803.5
Impact Loads

Equipment	Percentage Increase
Elevators	100%
Heavy machinery	25%
Craneways	25%
Monorails (3 ton capacity or over)	25%
Monorails (less than 3 ton capacity)	15%

A. Craneways. All craneways shall be designed to resist a lateral transverse force equal to 25 percent of the crane capacity plus the weight of the trolley applied ½ at the top of each runway rail; and a lateral longitudinal force equal to 12½ percent of the maximum wheel loads applied at the top of each rail.

B. Monorails. All monorails shall be designed to resist a lateral transverse force and a lateral longitudinal force of 5 percent of the rated capacity.

C. Outdoor Assembly Structures. Grandstands, stadiums and similar outdoor assembly structures shall be designed to resist a horizontal swaying load applied parallel to the rows of seats, in addition to the wind loads, of not less than 24 pounds per linear foot of seat, and of not less than 10 pounds per linear foot of seats applied transversely.

803.6 Special Loads. Provision shall be made for the special loads prescribed in 803.6 and all other special loads to which the building or structure may be subjected by its use.

A. Below Grade. All retaining walls and other walls below grade shall be designed to resist lateral soil pressure with due allowance for hydrostatic pressure and for all superimposed vertical loads. The design drawings shall include such loads with finish grade clearly indicated.

B. Hydrostatic Uplift. All foundation slabs and other footings subject to water pressure shall be designed to resist a uniformly distributed uplift equal to the full hydrostatic pressure.

C. Railings. Railings around stairwells and other floor openings shall be designed to resist a lateral force applied horizontally at the top of of the railings of 25 lbs. per linear foot and railings at the front of balconies of theaters and similar locations, a lateral force of 50 pounds per linear foot. In addition to the lateral loads, railings and guards of grandstands and similar outdoor assembly structures shall be capable of sustaining a vertical load of 100 pounds per linear foot.

803.7 Construction Loads. Provision shall be made for temporary construction and wind loads which may occur during the erection of the building and all structural members and connections shall be designed and erected so as to prevent overstressing during construction.

803.8 Live Load Reduction. In all buildings and structures except garages, warehouses and places of assembly, the design live loads other than roof loads may be reduced on girders, trusses, piers, walls and columns and their foundations as specified in 803.8.A through 803.8.C.

A. Live Loads 100 Pounds or Less. On any structural member which supports a floor area of 150 square feet or more, as provided in accordance with accepted engineering practice.

B. Live Loads More Than 100 Pounds. On columns of multi-story buildings other than storage use groups but not to exceed 20 percent.

C. Foundations and Column Supports. The foundation of walls, piers and columns or girder or truss supports of columns shall be designed for the above reduced live loads plus the full dead load as provided in Sec. 813.0.

803.9 Combined Loads. The structural frame of all buildings shall be investigated for the combined effect of all lateral and vertical loadings. The individual members shall be proportioned for the combined stress for the specific material.

Sec. 804.0 Snow Loads.

804.1 Roof Supports. The structural supports of the roof shall be designed to resist snow and wind loads in addition to the dead load of the construction and any special loads to which they may be subjected.

804.2 Flat and Pitched Roofs. Flat and pitched roofs shall be designed for a live load of not less than 30 pounds per square foot of horizontal projection, except that for roofs with a pitch exceeding four in twelve, the live load may be reduced by one-third. When used for incidental promenade purposes, roofs shall be designed for a minimum live load of 60 pounds per

square foot and 100 pounds per square foot when designed for roof-garden or assembly uses.

804.3 Curved Roofs. Roofs with a radius of curvature not less than the half-span nor more than the three-quarter span of the roof shall be designed to resist 20 pounds per square foot of horizontally projected areas. When valleys are formed by a multiple series of curved roofs, special provision shall be made for the increased load at the intersections.

804.4 Adjacent Roofs. Provision for differences in adjacent roof elevations of 5 feet or more or similar physical conditions which promote the buildup of snow and ice shall be made by using a 45 pounds per square foot live load for the lower level for a distance equal to the difference in elevation but not to exceed 20 feet.

Sec. 805.0 Wind Loads.

805.1 Wind Loads on Buildings. Buildings and other structures shall be designed and constructed to withstand the horizontal pressures shown in Table 805.1, allowing for wind from any direction. The height shall be measured above the average level of the ground adjacent to the building or structure. No allowance shall be made for the shielding effect of other buildings or structures.

Table 805.1
Design Wind Loads for Various Height Zones of Buildings and Other Structures

Height Zone Feet	Wind Pressure Lb. per Sq. Ft.
30 or less	15
31 to 49	20
50 to 99	25
100 to 499	30
500 to 999	35
1000 and over	40

805.2 Unusual Exposure. When located in unusually exposed positions subject to higher wind loads than specified in Table 605.0, the designed wind load shall be adjusted for the prevailing conditions.

805.3 Wind Load on Roofs. The roofs of all buildings and other structures shall be designed and constructed to withstand pressures, acting outward normal to the surface, equal to 1¼ times those specified for the corresponding height zone in which the roof is located. The height shall be taken as the

mean height of the roof structure above the average level of the ground adjacent to the building or structure and the pressure shall be assumed on the entire roof area.

A. Sloped Roofs. Roofs or sections of roofs with slopes greater than 30 degrees shall be designed and constructed to withstand pressures, acting inward normal to the surface, equal to those specified for the height zone in which the roof is located, and applied to the windward slope only.

B. Curved and Irregular Roofs. The effect of wind on curved or irregular shaped roofs may be determined by wind tunnel or equivalent test. In determining the effect of shape, the assumed wind velocity shall be the maximum average for a 5 minute period in the records of the U. S. Weather Bureau during the last 15-year period. The prescribed wind forces in Table 805.1 shall be modified accordingly.

C. Open Sides. Buildings or structures with one or more open sides shall be provided with adequate foundations and anchorage to resist the upward pressure specified in 805.3 with a factor of safety of one and one-half.

805.4 Wind Load on Walls.

A. On buildings or parts thereof that are 30 feet or less in height, the wind load on masonry walls need not be considered, unless the height exceeds 4 times the minimum width or when inadequate transverse bracing is provided or as provided in 805.5 or 805.6.

B. The wind force shall be distributed between opposite walls, ⅔ as a normal pressure on the windward side and ⅓ as a normal outward suction on the leeward side.

C. In buildings provided with wall openings consisting of ⅓ or more of the wall area, internal wind forces of ⅔ of the loads required by Table 805.1 shall be assumed to occur simultaneously with the above external forces both in pressure and suction.

805.5 Anchorage of Roofs and Walls. Roof framing shall be anchored to wall framing and walls to foundations so as to resist wind uplift and sliding in excess of 66⅔ percent of the dead load resistance.

805.6 Uplift on Eaves. Overhanging eaves, cornices and other wall and roof projections shall be designed and constructed to withstand an upward pressure 2½ times the load required by Table 805.1.

805.7 Overturning Resistance. Except as provided in 805.10.B, all buildings and structures shall be provided with adequate foundations and anchorage to resist 1¾ times the calculated overturning moment.

805.8 Ground Signs and Towers. The wind pressure on ground signs and towers shall be assumed at 15 pounds per square foot of net exposed area of the structure normal to the direction of the wind, for structures up to 50 feet in height and 20 pounds for structures over 50 feet in height.

805.9 Roof Structures.

A. The wind pressure on roof signs, tank towers, stacks, chimneys and other exposed roof structures with plane surfaces shall be based on the load required by Table 805.1 applied to the net projected area of the structure normal to the direction of the wind, except as provided in 805.9.B and 805.9.C.

B. The shielding effect of one element by another shall be considered when the distance between them is less than 4 times the projected smallest dimension of the windward element.

C. The wind pressure on circular tanks, stacks or other circular structures shall be assumed effective on ⅔ of the projected areas; and for hexagonal or octagonal structures on ⅞ of the projected area.

805.10 Radio and Television Towers.

A. All radio and television towers shall be designed to resist a wind load in accordance with Table 805.1 but not less than 30 pounds per square foot on the net area of both sides of latticed construction and on twice the projected area of the antenna. Where subject to winds of unusual velocity, the loads shall be increased accordingly.

B. Adequate foundations and anchorage shall be provided to resist 2 times the calculated overturning.

Sec. 806.0 Earthquake Loads.

All buildings and structures which are braced and anchored to resist the wind and racking loads shall be considered adequately designed to resist the lateral forces due to normal earthquake shocks expected in this area, except that parapet walls, ornamentation and other wall projections shall be adequately anchored to resist a lateral static load equal to the full dead load of the wall or other projection.

Sec. 807.0 Structural Load Tests.

807.1 Durability, Endurance and Maintenance Tests. Materials of construction shall be subjected to sustained and repetitive test loading to determine its resistance to fatigue, and tests for durability, weather resistance and maintenance of the standards of approved materials whenever reasonable doubt exists as to quality and the ability to perform.

807.2 Existing Structures. Whenever there is reasonable doubt as to the stability or structural safety of a completed building or structure or part thereof for the intended use, the building unit or portion of the structure in question shall be subjected to a load test; but in no case shall the structure be considered safe for the design live load unless it withstands 1½ times the live load without evidence of failure and recovers not less than 75 percent of the maximum deflection upon removal of the test load.

807.3 Tests of Service Equipment and Devices. When required by the Bureau or specified in this code, service equipment, accessories and devices shall be subjected to approved test procedures to ascertain their adequacy.

807.4 Test Specimens. The selection and construction of all test specimens and the details of test procedures shall be truly representative of the material, workmanship and details to be normally applied in practice. When structural or fire resistive properties of the material are dependent upon adequate curing, the age of the specimen shall not be less than 7 nor more than 28 days.

Sec. 808.0 Conditions for Load Tests.

808.1 Load Pattern. When the physical properties of new materials or methods of design and construction require evaluation by load tests, the test loads shall be made in a manner indicative of the load pattern to be normally applied. The use of hydraulic rams with point loadings or other approved devices that would result in deflections equal to those caused by the equivalent load pattern is permissible. Representative coupon tests of all materials used in the load tests shall be submitted with the load test data. Where such tests result in stresses exceeding the strength characteristics upon which the product or assembly design is based, the loads to be applied to justify the adequacy of the product or assembly shall be increased by the proportionate ratio of the excessive strength.

808.2 Working Load. Under the superimposed live load, the deflection of floor and roof assemblies shall be not greater than 1/360 of the span for plastered construction, 1/240 of the span for unplastered floor construction and 1/180 of the span for unplastered roof construction.

808.3 One and One-Half Times Design Live Load. Under 1½ times the superimposed working load, the construction shall show no signs of structural damage and shall recover not less than 75 percent of the maximum deflection after removal of the test load, to be followed by a second application

of the 1½ times test load without structural damage or increase in the residual deflection. The test procedure shall provide for an adequate time factor between the superimposed design loads. The times between such tests shall be not less than 3 hours for load application and 3 hours after load removal.

808.4 Two and One-Half Times Design Live Load. The test assembly shall sustain without ultimate failure 2½ times the superimposed live load for which approval is requested.

808.5 Wall and Partition Tests. Bearing wall and partition assemblies shall sustain the compression and racking load test without failure under 2½ times the design live load both with and without window framing.

808.6 Comparative Tests. When existing authoritative test data is not available, the Bureau may require comparative tests of assemblies of standard traditional forms of construction used for similar purposes to assist in determining the adequacy of the new construction.

Sec. 809.0 Prefabricated Construction.

809.1 All Elements. Prefabricated construction shall include all forms of prefabricated building elements and assembled construction units intended for basic or incidental structural purposes in all buildings of all use groups.

809.2 Materials. The use of all materials or methods of construction which meet the specified strength, durability, sanitary, and fire resistive requirements of this code shall be permitted in prefabricated construction.

809.3 Inspection. Where prefabricated units or assemblies are made in a shop outside the jurisdiction of the Bureau, shop reports covering the quality of the material and workmanship shall be submitted to the Bureau at or before delivery to the site. Such reports shall be based on records or tests made on the material or assembly before, during, or after fabrication as may be required. These records or tests shall be such as are required by the approved plans and specifications and by this code for the particular construction materials involved, and shall be submitted through the architect or professional engineer in charge of the work.

809.4 Certification. A verified report shall be furnished to the Bureau for each prefabricated building by the professional engineer or architect who supervised the fabrication and erection of the building.

Sec. 810.0 Plastic Construction.

810.1 Adequate Strength. All plastic materials and their assemblies shall be of adequate strength and durability to withstand the loads and forces specified by the design loads of this code and shall comply with the fire resistance and flame resistance requirements of Article 5.

810.2 Connections and Supports. All fastenings, connections and supports shall be proportioned to transmit 2½ times the design live load. Adequate allowance shall be made in the fastenings and supports for differential expansion and contraction of the connected materials.

810.3 Approved Uses. When required by the Bureau, all applications involving the use of thermoplastic or thermosetting materials shall be accompanied by the manufacturer's certificate identifying the product and certifying that the material or assembly has been approved for the specific use.

Sec. 811.0 Foundations.

811.1 Unit Bearing Capacity. All buildings and other structures shall be erected upon properly designed foundations capable of transmitting the required loads imposed by the structure to the ground in such a manner as not to exceed the unit bearing capacity of the soil at any point.

811.2 Adequate Bearing. When soil of adequate bearing power is not found, such buildings and other structures shall be supported on piles or ranging timbers properly designed to transmit the imposed loads to adequate bearing.

811.3 Distribution of Load. All foundation walls, piers, and other permanent supports shall be provided with spread footings of adequate size to properly distribute the imposed loads so as not to exceed the bearing values of the soil prescribed by this code.

811.4 Bearing Soil. Wall, pier and column footing shall bear on undisturbed solid ground, controlled compacted fill, or leveled rock and no footing shall be founded on frozen or filled ground except compacted fill shall be placed under the Controlled Material Procedure and shall be in accordance with accepted engineering practice.

811.5 Frost Depth Lines. Except when erected upon hardpan or solid rock or when properly designed to resist the effects of frost action, the bottom of all foundation walls, piers, footings, or other permanent supports shall be carried below the frost line but in no case less than 3 feet below finished grade line except as provided in 816.2 for lightweight structures. Greater or less depths may be approved when supported by certification of maximum frost penetration by the professional of record.

811.6 Exceptions. Temporary one-story buildings or one-story buildings of wood frame or unprotected metal construction not exceeding 750 square feet in area shall not require permanent foundations.

Sec. 812.0 Foundation Standards.

Unless specifically provided for in this code, compliance with accepted engineering practice for excavations and foundations shall be deemed to comply with this Section.

Sec. 813.0 Foundation Design Procedure.

813.1 Loads to Be Supported. In the design of footings, the full dead load including the weight of the footings, foundations, and overlying fill and the reduced required live loads specified in 803.8.C on the lowest walls, piers, or columns shall be used. If the increased pressure on any footing due to wind or other lateral loads does not exceed ⅓ of the sum of the full dead and the required live load pressures alone, such loads may be disregarded. When such increased pressure is more than ⅓, the lateral loads shall be considered in the design with a ⅓ increase in the allowable soil pressure under the combined load.

813.2 Load Distribution. The areas of footing shall be so proportioned that the unit soil pressure under the full dead load alone shall be as uniform as possible under all parts of the structure. Where varying soil conditions exist, reasonable variations may be permitted in the unit pressures under different footings. The total design loads on a footing shall not cause pressure in excess of the allowable bearing capacity of the soil except as permitted for combined loads in 813.1.

813.3 Test Borings.

A. Soil conditions shall be adequate for the design loads.

B. All applications for the construction of new buildings or other structures, and for the alteration of permanent structures which require changes in foundation loads or distribution, shall be accompanied by a statement indicating the soil has been investigated and found adequate for the design value included therein. Such statement shall include records of borings or tests showing the character and load bearing capacity of the soil. In the absence of satisfactory data from immediately adjacent areas or other authentic sources, the owner or appliant shall make borings, test pits, or other soil investigations at such locations and to sufficient depths of the bearing materials to establish its character and thickness as required.

C. For structures more than 3 stories or 40 feet in height, or for any structure having an average total load exceeding 1000 pounds per square foot over the entire area, at least one exploratory boring in every 5000 square feet of built-over area shall be made and carried

to a depth which shows 25 continuous feet of material of Class 7 or better in Table 813.4 to a depth of 5 feet into ledge rock. Samples of the strata penetrated in test borings or test pits showing the natural disposition and conditions at the site shall be available for examination by the Bureau. Wash or bucket samples shall not be acceptable.

813.4 Presumptive Soil Values at Surface. Except when determined by field loading tests and approved by the Bureau, the maximum allowable pressure on supporting soils under spread footings shall not exceed the presumptive values given in Table 813.4 at the surface. The soil bearing values shall be adjusted for deep footings and distribution of loads under piles and caissons.

Table 813.4
Presumptive Soil Values at Surface

Class No.	Material	Tons per Sq. Ft.
1.	Massive crystalline bed rock	100
2.	Foliated rock	40
3.	Sedimentary rock	25
4.	Soft or broken bed rock and soft limestone	10
5.	Compacted, partially cemented gravels, sand and hardpan overlying rock	10
6.	Gravel and sand-gravel mixtures	6
7.	Loose gravel, hard dry clay, compact coarse sand and soft shales	4
8.	Loose coarse sand and sand-gravel mixtures and compact fine sand (confined)	3
9.	Loose medium sand (confined) stiff clay	2
10.	Soft broken shale, soft clay	1.5

813.5 Soil Tests. When the safe-sustaining power of the soil is in doubt, or it is desired to exceed the presumptive bearing capacities specified in Table 813.4, soil tests shall be made to determine the sustaining power of the soil. A complete record of the tests, together with a record of the soil profile shall be filed by the professional engineer or architect who shall have a qualified person on the site during all test operations.

Sec. 814.0 Pile Foundations.

814.1 Accepted Engineering Practice. All pile foundations shall conform to this code and accepted engineering practice.

814.2 Evaluation of Supporting Materials. The bearing value of soils supporting pile foundations shall be evaluated by driving resistance or loading tests.

814.3 Satisfactory Bearing. The foundation loads of buildings and other structures on pile foundations shall be carried down to satisfactory bearing materials so that the entire transmitted load is supported without causing damaging vertical or lateral movement.

814.4 Limiting Pile Loads. The approved load on any single pile shall not exceed the limits of Table 814.4, except where higher values can be substantiated on the basis of load test and analysis.

Table 814.4
Limiting Pile Loads

Type of Pile	Tons
Open-ended concrete-filled steel piles on rock	200
Steel pipe or H-piles bearing on rock	150
All other piles bearing on rock except timber piles	120
Piles other than timber piles bearing on or in materials of Classes 3, 4 or 5 in Table 813.4	80
When bearing on or in other materials	60
Timber piles with 10 inch or larger point	30
Timber piles with 8 inch point	25
Timber piles with 6 inch point	20

814.5 Protection of Piles. Where the boring records or conditions of use at the site indicate possible deleterious action on the material of the pile because of soil constituents or changing water levels, the pile shall be adequately protected. This protection shall be by approved preservatives, impervious incasements which will not be rendered ineffective by driving or a jacket of concrete.

814.6 Pile Driving Record. A pile driving record on an approved form shall be filed under the seal of the professional of record. The project data form prescribed in Chapter 110, Plan Filing of Title 12, N.J.A.C. shall be used to record the necessary pile driving information.

Sec. 815.0 Foundation Walls.

815.1 Imposed Loads. Foundation walls which are wholly or partially below grade shall be capable of supporting the imposed vertical loads and resisting the lateral pressure of adjacent soil with due allowance for water pressure and possible surcharge from fixed or moving loads.

815.2 Types of Construction. Such foundation walls or similar structures shall be constructed of masonry, concrete, or other approved forms of construction. Materials which are subject to corrosion or deterioration for any reason shall be treated with an approved preservative or encased in an approved protective material.

815.3 Design of Walls. The design and construction of all foundation walls shall comply with the applicable accepted engineering practice of 802.1.B, 802.3.A, or 802.5 for the particular material to be used in construction of the wall.

Sec. 816.0 Mat, Raft, and Float Foundation.

816.1 When Used. Mat, raft, and float foundations shall be used only when the applied loads of the building or structure are so arranged so as to approximate uniformly balanced loading and the soil immediately below the mat is of uniform bearing capacity. The characteristics of the bearing soil shall be considered in the analysis of loading on mats and other continuous footings and due allowance shall be made for possible concentrated soil pressures under heavily loaded columns and for possible differential settlement.

816.2 Light-Weight Structures. One-story, light-weight wood or unprotected steel frame buildings may be erected on a continuous foundation mat located directly on undisturbed ground. The mat shall be insulated from the ground and damp-proofed and shall be reinforced to distribute the load of the building uniformly over the area. The foundation mat shall be floated on a layer of broken stone or its equivalent with wall trenches where necessary to provide adequate sub-soil drainage. The reinforcement shall be in addition to any embedded piping installed for heating purposes. Wood frame walls erected on such floating mats shall be located sufficiently above grade to insure protection from water, snow, and termites and where necessary, a rat-proof apron shall be provided.

Sec. 817.0 Special Piles and Foundation Systems.

Types of piles and foundation methods not specifically covered by this code may be approved after submission of test data, design and construction information to the Bureau for approval. Complete test demonstrations for new types of piles or soil consolidation methods shall be made on the site to determine the adequacy and suitability of the foundation system.

ARTICLE 9

LIGHT, VENTILATION, HEAT, AIR CONDITIONING, AND REFRIGERATION

SEC. 900.0 SCOPE.

This Article of the code shall apply to light, heat, ventilation, air conditioning and refrigeration.

SEC. 901.0 HEALTHFUL ENVIRONMENT.

901.1 OCCUPATIONAL AND OTHER ROOMS. Occupational and other rooms and spaces occupied by employees shall be arranged, located, lighted, heated and ventilated to provide a safe and healthful environment.

901.2 ALTERATIONS. No building shall be altered or rearranged so as to reduce the amount of light, heat and ventilation of any room or space to less than that required by this code; or so as to create an additional room unless made to conform to this Article 9. The Bureau may permit altered spaces to be of the same height as existing within the same story unless it is necessary to provide additional light and ventilation to meet required conditions.

901.3 EXISTING CONDITIONS. In all existing rooms or spaces when the provisions for light, ventilation, and air conditioning do not meet the requirements of this code and the existing condition is dangerous to the health and safety of the occupants, the Bureau shall order the required repairs or installation to render the building acceptable for the approved use and occupancy load.

SEC. 902.0 NATURAL LIGHT.

902.1 HOW FURNISHED. Natural light shall be furnished by fixed or operable windows, skylights, monitors, glazed doors, transoms, or transparent or translucent panels, or by other light transmitting media facing the sky, a public street, alley or open space, or facing a yard or court complying with Sec. 907.0 or Sec. 908.0. Where the light transmission rate is less than that of plain glass $\frac{3}{32}$ inches thick, the area of the light transmitting media shall be increased proportionately.

902.2 OCCUPATIONAL ROOMS. Occupational rooms shall be provided with natural light equivalent in area to 10 percent of the floor area, except that

kitchens when ventilated mechanically shall not be required to be provided with natural light.

902.3 ALCOVES. Alcoves shall be separately lighted, except that when the opening from the alcove to the adjoining room or space is at least 80 percent of the common wall, the alcove may be considered part of the adjoining room.

SEC. 903.0 ARTIFICIAL LIGHT.

903.1 WHERE REQUIRED. All occupational rooms and other interior rooms or spaces, including exits, basements, cellars, attics and service spaces shall be provided with artificial light in accordance with accepted engineering practice.

903.2 BATH AND TOILET ROOMS. Bath and toilet rooms in storage, mercantile, industrial and business occupancies shall have a minimum of 5 foot candles of artificial light measured at a level of 30 inches above the floor.

903.3 EXIT LIGHTING.

A. Lighting shall be provided in all exits and their approaches for the full length at changes in direction and intersections of aisles, corridors, balconies, exit passageways, stairs, ramps, escalators, tunnels, vestibules, landings, platforms, doors and other means of egress.

B. Illumination of at least 3 foot candles measured at the floor level shall be maintained continuously. It shall be designed so that failure of one light shall not leave an area in darkness.

903.4 LIGHTING FOR EXIT SIGNS. Exit signs shall be lighted in all buildings or spaces.

903.5 EXIT SIGN ILLUMINATION. Exit signs required to be lighted shall be lighted continuously during occupancy. The signs shall be externally illuminated by an electric ruby red colored light bulb of not less than 25 watts so as to provide not less than 25 foot candles on the exposed face of the sign or they shall be internally or edge lighted signs in which the average initial brightness of the letters is not less than 25 foot lamberts and where the signs use an illuminated background, it shall have an average initial brightness of not less than 250 foot lamberts. Lamp life multipliers may not be used on internally or edge lighted signs where they reduce the effective illumination.

903.6 EXIT LIGHTING CONNECTIONS. Exit lighting and exit signs shall be supplied with current from a separate circuit or circuits in accordance with 903.7.C(1).

903.7 Emergency Lighting.

A. Where required. Emergency lighting shall be provided in:
   (1) Exits in accordance with 903.3.A.
   (2) Public spaces.
   (3) Special spaces that will not be evacuated immediately, such as an emergency control center.
   (4) Any occupied room, space or fire area with an occupancy load of over 50.
   (5) Buildings exceeding 100,000 square feet in area.
   (6) Unlimited area buildings.
   (7) Windowless buildings.
   (8) Exit tunnels.
   (9) Underground structures.

B. Duration. The emergency lighting shall be capable of functioning in event of failure of normal lighting for a period of ½ hour.

C. Power Source. Power for emergency lighting shall be furnished through an independent electrical wiring system supplied from a main source or from an auxiliary source in accordance with Sec. 1103.0. Power shall be furnished when failure occurs.
   (1) When an auxiliary source is not required, the connection of the emergency lighting and power shall be taken on the supply side of the main service disconnect.
   (2) When an auxiliary source is required, means shall be provided for automatically transferring the emergency lighting and power supply from the main source to the auxiliary source within 15 seconds in the event of failure of the main source. The auxiliary source shall have a capacity sufficient to supply and maintain the total emergency lighting and power load with not more than a 9 percent reduction from rated system voltage.

Sec. 904.0 Natural Ventilation.

904.1 How Provided. Natural ventilation shall be provided by openings, such as windows, skylights, or louvers to a public street, alley or open space or to a yard or court complying with Sec. 907.0 and Sec. 908.0. Only the net free area of the opening shall count as the ventilation area.

904.2 Occupational Rooms. All occupational rooms or other spaces occupied by persons, when provided only with natural ventilation, shall have natural ventilation equivalent in openable or free area to 5 percent of the floor area.

904.3 Bath and Toilet Rooms. Bath and toilet rooms, when provided with natural ventilation, shall comply with 904.2.

904.4 Alcove Rooms. Alcoves shall be separately ventilated, except that when the opening to the adjoining room or space is at least 80 percent of the common wall and when the area of the alcove is less than twice the area of the common opening, the alcove may be considered part of the adjoining room.

904.5 Basements and Cellars. Except as may be required in 904.2 or Article 7, natural ventilation equivalent in openable or free area in basements and cellars shall not be less than 2 percent of the floor area served.

904.6 Assembly Rooms. In addition to the requirements of Article 7, the required or other approved devices for natural ventilation shall be distributed as equally as practicable on at least two sides of the room.

904.7 Attic Spaces. All unoccupied attic spaces and spaces between roofs and top floor ceilings shall be ventilated by not less than two opposite windows, louvers, or vents with a total free area of opening not less than 1/150 of the area of the horizontal projection of the roof.

904.8 Crawl Spaces. In buildings and structures constructed without basements or cellars in which the first floor construction does not bear directly on the ground, a space shall be provided under the first floor not less than 18 inches in depth. Such space when not designed as a warm air plenum shall be vented to provide cross ventilation with screened openings having a clear area of not less than ⅓ of one percent of the enclosed building area, or with other means of ventilation approved by the Bureau. When floating mat foundations are provided in accordance with Article 8, the requirements for ventilation shall not apply.

Sec. 905.0 Mechanical Ventilation.

905.1 When Required. All buildings shall be provided with mechanical ventilation based upon Table 905.1 for the various uses and occupancies in accordance with accepted engineering practice under the following conditions:

A. When natural ventilation does not provide the ventilation required by Sec. 904.0, mechanical ventilation shall supply all of that portion of the required ventilation not supplied.

B. When dust, fumes, gases, vapors or other noxious or deleterious impurities create a fire or health hazard as required by Article 7.

C. Occupational rooms with reduced ceiling height when approved by the Bureau.

Table 905.1

Circulation Rates and Fresh Air Supply

Occupancy or Use of Space	Mechanical Ventilated Areas			Air Conditioned Areas	
	Circulation Rate		Minimum Fresh Air Supply	Circulation Rate	Minimum Fresh Air Supply
	Winter Changes/Hour	Summer Changes/Hour	CFM/Sq. Ft.	Changes/Hour	CFM/Sq. Ft.
BUILDING USE GROUPS					
High Hazard	Concentration of hazardous material shall not exceed 25 percent of the lower explosive limit.				
Storage					
Active	2.00	4.00	0.167	1.00	0.033
Transient	1.00	2.00	0.10	0.50	0.017
Mercantile					
Shops, Stores	6.00	12.00	0.50	6.00	0.20
Showrooms	2.00	4.00	0.167	2.00	0.067
Food Processing	8.00	16.00	1.33	8.00	0.267
Industrial					
Sedentary	4.00	8.00	0.33	4.00	0.133
Active	6.00	12.00	0.50	6.00	0.200
Business					
Service	6.00	12.00	0.50	6.00	0.20
Assembly					
Night Clubs	24.00	36.00	2.00	24.00	2.00
Cafeterias	16.00	24.00	1.33	16.00	1.33
Restaurants	12.00	18.00	1.00	12.00	1.00
Terminals	12.00	18.00	1.00	12.00	1.00
Theaters	12.00	18.00	1.00	12.00	1.00
Recreation Centers	12.00	18.00	1.00	12.00	1.00
Convention Halls	12.00	18.00	1.00	12.00	1.00
SPECIAL USES					
Bath & Toilets					
Private	7.50	7.50	1.25	7.50	1.25
Public	10.00	10.00	1.67	10.00	1.67
Industrial	12.00	12.00	2.00	12.00	2.00
Boiler Rooms—See Article 7					
Cellars					
Unoccupied	1.00	2.00	0.10	2.00	0.05
Occupied	8.00	16.00	0.67	8.00	0.33
Conference Rooms	16.00	24.00	1.33	16.00	1.33
Elevator Machine Rooms			1.00		
Flammables, Dusts, Special Processes—See Article 7					
Garages, Motor Vehicle Service Stations—See Article 7					
Kitchens	12.00	24.00	2.00	12.00	1.00
Offices	4.00	8.00	0.33	4.00	0.13
Recreation					
Sedentary	2.00	4.00	0.33	4.00	0.33
Active	8.00	16.00	1.33	8.00	1.33

Notes to Table

1. Values shown do not account for unusual environmental conditions.
2. Where additional local exhaust control is required, provision shall be made for equal quantity of tempered supply air.
3. System shall operate at all times when the building is occupied.
4. Where ceiling heights exceed 10 feet, the air circulation rate may be based on an assumed 10 feet ceiling height.

905.2 How Supplied.

A. Outside air shall be taken from an uncontaminated source and shall be filtered and tempered except where the occupancy load is less than one person per 800 square feet in open areas.

B. No air shall be recirculated from spaces such as toilets, garages or other spaces involving dust, fumes, gases, vapors or noxious or deleterious impurities.

C. Air coming in contact with persons shall not constitute a hazard or nuisance.

D. The quantity of supply air shall at least equal that exhausted.

E. Spaces containing fuel burning equipment shall be supplied with additional air from the outside to adequately provide for combustion.

F. In air conditioned structures no allowance shall be made for the area of windows or other openings in determining the ventilation requirements.

G. The area of a balcony or mezzanine shall be added to that of the main floor to determine the ventilation requirements.

H. Clean air from another source may be used. Supply air for ventilation may be taken progressively from uncontaminated adjoining spaces.

905.3 Air Conditioning Systems. Where air conditioning systems and mechanical ventilation are used as an alternate for natural ventilation, the system, equipment and distributing ducts shall be installed in accordance with 601.5, Sec. 905.0, Article 7, and Article 8. Such systems shall be kept in operation at all times during normal occupancy of the building or space.

Sec. 906.0 Windowless Buildings.

Buildings without windows opening on yards, courts or open spaces may be erected for storage, industrial, mercantile and business uses within the height and area limitations of Article 4 and Table 401.1 provided they are equipped with approved artificial lighting complying with Sec. 903.0, mechanical ventilation complying with Sec. 905.0, and with the fire protection requirements of Article 13.

Sec. 907.0 Courts.

907.1 Compliance. All courts required to serve rooms for light and ventilation purposes shall be uncovered and comply with this Sec. 907.0.

907.2 Size of Court. Every court shall have a minimum width of 3 inches for each foot of height or fraction thereof but not less than 5 feet for outer courts and twice these values for inner courts; in the case of irregular or gore width, provided that no such court shall be less than 5 feet at any point. The cross-sectional area of an inner court shall be not less than 1½ times the shaped courts, the required minimum width may be deemed to be the average square of its minimum required width; nor shall the length of any court be more than two times its width.

907.3 Access to Courts. Access shall be provided at the bottom of every court for purposes of cleaning.

907.4 Court Walls. When windows facing on courts do not receive adequate direct light by reason of peculiar arrangement or orientation, the walls may be constructed of light colored masonry, painted, or maintained in a light color to furnish additional reflected light.

907.5 Court Drainage. The bottom of every court shall be properly graded and drained to a public sewer or other approved disposal system complying with Article 12 and shall be paved with concrete or other nonabsorbent material.

907.6 Court Area. No building shall be enlarged, nor shall the lot on which it is located be diminished so as to decrease the required area to less than that for natural lighting or ventilation of new buildings.

907.7 Buildings on Same Site. If more than one building is placed on a site or if a building is placed on the same site with existing buildings, the several buildings shall each be provided with courts as required where natural light or ventilation is provided.

907.8 Obstructions and Encroachments on Courts. Every required court shall remain unobstructed for its required area and full height, except for the encroachments permitted in Sec. 410.0. Landscaping features shall not be prohibited in the open spaces at ground level and required court areas may be used for automobile parking spaces when such use does not conflict with Article 5 and provided required windows for light and ventilation and paths of travel from exits to the street are not obstructed.

Sec. 908.0 Yards.

908.1 Compliance. All yards where required shall be uncovered and comply with this Sec. 908.0.

908.2 Rear Yards. In buildings of any occupancy, no rear yard shall be required for the first story. Above the first story and for a height not to exceed

35 feet above the first story, the rear line of the building shall be set back not less than 15 feet from the lot line. At any level above this height the set back shall be increased 3 inches for each foot that the height of that level exceeds 35 feet.

908.3 SIDE YARDS. Side yards serving windows in buildings shall have a width not less than 3 inches for each foot of height of the buildings, but not less than 5 feet at any point.

908.4 YARD AREA. Yard areas shall comply with 907.6.

908.5 BUILDING ON SAME SITE. If more than one building is placed on a site or if a building is placed on the same site with existing buildings, the several buildings shall each be provided with yards as required where natural light and ventilation is provided, except that the distance between adjacent buildings on the same site shall be twice that required for side yards, unless greater separation is required by Article 13.

908.6 OBSTRUCTIONS AND ENCROACHMENTS ON YARDS. Obstructions and encroachments on yards shall comply with 907.8.

SEC. 909.0 WINDOW CLEANING.

909.1 SAFEGUARDS. All buildings and structures over 50 feet or four stories in height, in which the windows are cleaned from the outside shall be provided with anchors or other approved safety devices for all window openings. Such anchors, belt terminals or other devices shall be of approved design, constructed of corrosion-resistive materials securely attached to the window frames or anchored in the enclosure walls of the building. Cast iron or cast bronze anchors shall be prohibited.

909.2 PLATFORMS. Window cleaning platforms and other devices shall conform with accepted engineering practice.

SEC. 910.0 HEATING.

910.1 WHEN REQUIRED. All buildings which are in whole or in part a place of employment shall be provided with heating facilities capable of producing the minimum temperatures specified in 910.2.

910.2 MINIMUM TEMPERATURES. All places of employment shall be kept at the following minimum temperatures when occupied by employees:

A. Wash, locker, rest, dressing and lunch rooms, 70° F.

B. Toilet rooms, 70° F.

C. Other portions of buildings where employees are assigned to relatively fixed positions or locations and are not subject to physical exertion, 68° F.

D. Other areas of buildings where employees are permitted freedom of movement and are not restricted to a relatively fixed position, 55° F.

E. When approved by the Bureau, portions of buildings which are occupied by only a few people for a small part of the working day may be maintained at less than 55° F.

910.3 HEAT LOSS CALCULATIONS. The determination of the heat requirements of the building or structure shall be based upon accepted engineering practice.

910.4 CAPACITY. The capacity of listed heat producing appliances shall be that shown on the name plate. The capacity of unlisted heat producing appliances shall be that certified by the manufacturer.

910.5 INSTALLATION. All heat producing appliances shall be installed as provided in Article 10.

SEC. 911.0 REFRIGERATION.

911.1 MECHANICAL REFRIGERATION. The design and installation of mechanical refrigeration systems shall be in accordance with accepted engineering practice.

911.2 OPERATION AND MAINTENANCE. Refrigeration systems using those refrigerants specified as flammable or toxic or which are rated over six tons refrigerating capacity shall be operated in accordance with the requirements of the Mechanical Inspection Bureau.

ARTICLE 10

HEAT PRODUCING APPLIANCES

Sec. 1000.0 Scope.

This Article of the code shall apply to fire safety requirements for the installation, operation and maintenance of heating and other potentially hazardous building service equipment.

Sec. 1001.0 Appliances.

1001.1 Installation. The construction, installation, inspection, and maintenance of all heat producing appliances, heating, ventilating or air conditioning systems in all buildings and structures with respect to structural strength, fire safety and operation shall be in accordance with Chapter 121, Heat Producing Appliances and Air Conditioning Systems of Title 12, N.J.A.C.

1001.2 Mounting. Heat producing appliances shall be mounted on the ground or on floors of fire resistive construction with noncombustible flooring and surface finish having no combustible material against the underside thereof or on combustible construction when listed for such mounting.

1001.3 Clearances from Combustible Construction. All heat producing appliances shall be installed with adequate clearances from combustible material or shall be provided with integral insulation of the appliance so that continued or intermittent operation shall not raise the temperature on the surface of combustible ceilings, walls or partitions more than 90° F. above room temperature.

1001.4 Location. Heat producing appliances shall not obstruct exits or any aisle or passage used as a means of egress. Heat producing appliances shall be easily accessible for operation and maintenance.

1001.5 Hazardous Locations. Heat producing appliances burning fuels shall not be located in hazardous areas containing flammable vapors or dusts, readily combustible fibers or other highly combustible substances, except when the equipment is entirely enclosed as indirect fired equipment, the enclosing surface of which does not develop temperatures which would produce ignition in the area.

Sec. 1002.0 Appliance Enclosures.

1002.1 Industrial Type High and Medium Heat Appliances. Industrial type high heat and medium heat appliances installed in buildings shall be enclosed by walls, ceilings and floors having a fire resistance rating of not less than 2 hours, except an enclosure is not required:

A. In a one story building of either industrial or storage occupancy provided that the appliance is separated from combustible contents by an open unobstructed space not less than 15 feet in width or by a solid noncombustible barrier placed at a distance of not less than 6 feet from the appliance, under one of the following conditions.

(1) Building is of Type 1 or Type 2 construction, or

(2) Building is equipped with an automatic sprinkler system, or

(3) Building and its contents provide a fire load of not over 24,000 Btu per square foot.

B. When the heat producing appliance is part of work process.

C. When permitted to be unenclosed by Article 7.

1002.2 Industrial Type Low Heat Appliances. Industrial type low-heat appliances other than unit heaters and similar appliances installed in buildings shall be enclosed by walls, ceilings and floors having a fire resistance rating of not less than ¾ hour, except an enclosure is not required:

A. In industrial and storage occupancies.

B. When the heat producing appliance is part of a work process.

C. When permitted to be unenclosed by Article 7.

Sec. 1003.0 Air for Combustion and Ventilation.

1003.1 When Required. Requirements for air are intended to apply to appliances that are installed in buildings and which need air for combustion, ventilation and draft hood dilution from spaces within the building. They are not intended to apply to: (1) sealed combustion system appliances which are constructed and installed so that all air for combustion is derived from the outside atmosphere and all flue gases are discharged to the outside atmosphere, or (2) enclosed furnaces which incorporate an integral total enclosure and use only outside air for combustion and draft hood dilution.

1003.2 Ventilation Air. Appliances shall be installed in a location in which the facilities for ventilation permit satisfactory combustion of fuel, proper venting and the maintenance of ambient temperature at safe limits

under normal conditions of use. Appliances shall be located so as not to interfere with proper circulation of air within the closed space. When buildings are so tight that normal infiltration does not meet air requirements, outside air shall be introduced.

1003.3 Combustion Air. Air for combustion for heat producing appliances shall be in addition to the ventilation requirements of the occupancy.

1003.4 Appliances on Roofs. Appliances installed on roofs shall be listed for outdoor installation or shall be designed to withstand atmospheric and climatic conditions in the areas in which they are to be installed.

Sec. 1004.0 Chimneys, Fire Places and Venting Systems.

1004.1 Design and Installation. The design, construction and installation of chimneys, flues and venting systems shall be in accordance with Chapter 121, Heat Producing Appliances and Air Conditioning Systems of Title 12, N.J.A.C.

1004.2 Smoke Test. Chimneys, flues and venting systems shall be proved tight by a smoke test after erection and before putting into use when required by the Bureau.

1004.3 Spark Arrester. All chimneys, flues and venting systems which emit sparks that create a fire hazard, shall be provided with a spark arrester of approved noncombustible construction.

1004.4 On Adjoining Buildings.

A. Whenever a building is hereafter erected, enlarged or increased in height so that a wall along an interior lot line, or within 3 feet thereof, extends above the top of an existing chimney, flue or vent of an adjoining existing building, the owner of the building so erected, enlarged or increased in height shall carry up at his own expense, with the consent of the adjoining property owner, either independently, or in his own building, all chimneys, flues and vents of such adjoining buildings which are within 15 feet of any portion of the wall extending above such adjoining chimney, flue or vent. The extension shall be carried up simultaneously with the new walls.

B. The construction of an extended chimney flue or vent covered in 1004.4 shall conform to the requirements of this section for new chimneys, flues and vents, but in no case shall the internal area of such extension be less than that of the existing chimney, flue or vent.

C. The owner of the building which is erected, enlarged or increased in height shall notify in writing and secure the consent of the owner of

the existing chimney, flue or vent affected at least 10 days before starting such work.

D. New wall openings shall not be constructed in any lot line wall or other wall which are within 12 feet vertically at the top of any existing chimney, flue or vent of an adjoining structure, unless such openings are not less than 15 feet horizontally from the top of such chimney, flue or vent and except further, that approved fixed window assemblies shall not be considered wall openings within the meaning of this section.

E. In place of extending existing chimneys, flues and vents to a height above the level of the new higher buildings, the owner of the new wall or structure may equip such chimneys, flues or vents with a mechanical device or other means to insure adequate updraft and prevent harmful downdraft in operation.

Sec. 1005.0 Fired and Unfired Pressure Vessels.

Fired and unfired pressure vessels shall comply with the requirements of the Mechanical Inspection Bureau of the Division of Labor Standards.

Sec. 1006.0 Smoke Abatement.

Heat producing appliances shall not discharge under normal conditions of operation excessive smoke, soot, cinders, fly-ash, gases or other materials which are deleterious to the safety or health of the public as determined by Chapter 20, Air Pollution Control Code of Title 9C, N.J.A.C.

ARTICLE 11

ELECTRICAL WIRING AND EQUIPMENT

SEC. 1100.0 SCOPE.

This Article of the code shall apply to all electrical equipment and wiring.

SEC. 1101.0 APPROVED EQUIPMENT.

1101.1 LISTED EQUIPMENT. The materials, fittings, appliances, devices and other equipment listed in publications of nationally recognized testing agencies and installed in accordance with their listing shall be accepted as approved equipment.

1101.2 ALTERNATE CONSTRUCTION. Types of construction and construction methods not covered by accepted engineering practice and types of electrical equipment not listed may be accepted as approved equipment when these types of construction, construction methods and types of equipment are deemed by the Bureau to be reasonably safe to persons and property.

SEC. 1102.0 ACCEPTED ENGINEERING PRACTICE.

Except as may be specifically required by this code or by other Chapters of Title 12, N.J.A.C., electrical wiring and equipment shall be installed in accordance with Chapter 162, Electrical Installations of Title 12, N.J.A.C.

SEC. 1103.0 EMERGENCY POWER.

Emergency power shall be available for required emergency lighting, required emergency ventilation equipment, fire pumps supplying sprinkler or hose systems, elevators in areas of refuge, industrial processes where current interruption would cause hazards, public address emergencies, and other similar purposes.

ARTICLE 12

PLUMBING

SEC. 1200.0 SCOPE.

This Article of the code shall apply to the design, construction, installation, arrangement, inspection, maintenance and performance of plumbing equipment, water distribution systems, drainage systems, venting systems, sanitation facilities, and personnel service facilities.

SEC. 1201.0 PLUMBING.

Plumbing shall comply with the Plumbing Code of New Jersey.

SEC. 1202.0 SANITATION.

Sanitation shall comply with Chapter 120, Sanitation of Title 12, N.J.A.C.

ARTICLE 13

FIRE PROTECTION REQUIREMENTS

SEC. 1300.0 SCOPE.

This Article of the code shall apply to fire safety by the installation of fire alarm, fire and smoke detection, fire extinguishing and other emergency systems.

SEC. 1301.0 AUTOMATIC SPRINKLER SYSTEMS.

1301.1 WHEN REQUIRED. Except as provided in 1301.2, automatic sprinkler systems shall be provided in buildings or fire areas as provided below:

A. As provided in Article 7.

B. Unlimited area buildings.

C. Buildings increased in area or height above the tabular areas of Table 401.1 in accordance with the sprinkler increase as provided by 402.2.

D. Basements and cellars or parts thereof which exceed one half the tabular area of Table 401.1, in buildings or fire areas used for the manufacture, sale or storage of combustible material.

E. Buildings over two stories in height which are without windows or other similar openings except buildings or parts thereof used as refrigerating plants or cold storage.

F. Open stairs and escalators as provided in 612.9.E.5, 612.9.E.6, and 412.8.B.

1301.2 EXCEPTION TO SPRINKLER PROTECTION.

A. Automatic sprinkler protection shall not be required by 1301.1 when the fire load is less than 8,000 Btu per square foot.

B. Enclosures housing special hazardous processes or used for storage of flammable or highly combustible materials and in other special situations may be protected with a deluge type sprinkler installation when permitted by the Bureau.

1301.3 DESIGN AND CONSTRUCTION.

A. Sprinkler systems shall be designed, constructed and tested in accordance with accepted engineering practice.

B. Automatic sprinkler systems shall be designed for the hazard classification of the use group classification of 301.1.

C. High temperature sprinkler heads may be used if the delayed operation of the sprinklers do not increase the hazard.

D. Hydraulically designed sprinkler systems shall be permitted.

E. Wet pipe sprinkler systems not exceeding 20 heads may use approved anti-freeze solutions in small unheated areas subject to freezing.

F. Dry pipe systems may be installed where the sprinkler system is subject to temperatures below freezing.

G. An automatic dry pipe system or approved open or closed system controlled by a heat sensitive device which admits water to the system and simultaneously gives an alarm may be permitted. Auxiliary manual controls shall be provided.

H. Sprinkler systems shall be provided with approved fire department inlet connection.

1301.4 WATER SUPPLY.

A. The water supply for sprinkler systems shall be from an adequate source in accordance with the accepted engineering practice cited in 1301.3.A.

B. The water supply shall be supplied through a system of pipes and risers which is separate from the supply piping serving the normal water requirements of the occupancy except that:

(1) For buildings of unlimited area and for special uses and occupancies, water shall be supplied from two sources complying with 1301.4.C, each being at least adequate in capacity to supply the requirements of at least one curtain board area as provided in 1301.4.C.

(2) In small isolated or special areas requiring sprinklers, partial systems using the normal water supply piping may be used when the pressure is not less than 15 psi at the topmost fixture and there are not more than 20 sprinkler heads in any one fire area. The size of the supply pipe shall not be less than that required for the sprinkler line.

C. When the water supply for a sprinkler system is required to be from two sources, it shall be interpreted to mean—two independent water lines (sources) on the premises and connected to the building such as any combination public water main, well supply, storage tank, natural water source or reservoir. These may be:

(1) One or more water main connections from public source.

(2) One or more automatic fire water pumping stations from natural sources remotely located.

(3) Any elevated tank or an artificial reservoir.

(4) Interconnection of two different sources at or within the building.

(5) Siamese or fire department hose connection for sprinklers located on the outside of building.

D. Where there is more than one demand placed on the water supply by the fire-protection requirements, such as sprinklers, standpipes, horizontal fire lines or spray installations, the total supply shall be adequate to meet the demand when it is determined that the demands may be simultaneous.

E. Where freezing conditions are likely to exist, piping and other water connections shall be protected.

Sec. 1302.0 Standpipes.

1302.1 When Required. Standpipes shall be required in buildings and parts of buildings as follows:

A. As required by Article 7.

B. Unlimited area buildings.

C. Buildings over 2 stories or 40 feet in height which exceed the tabular areas of Table 301.0 and which are not equipped with automatic sprinkler systems.

D. Buildings over five stories or 65 feet in height.

E. Buildings which are without windows or other similar openings, except buildings or parts thereof used as refrigerating plants or for cold storage.

1302.2 Design and Construction.

A. Standpipes shall be designed, constructed and tested in accordance with the accepted engineering practice.

B. Standpipe risers shall be of adequate size and located to supply hose stations equipped with 2½ inch hose connections.

C. The number of standpipe risers shall be based on the required number of hose stations for each floor. Sufficient hose stations to reach

all portions of each floor within 30 feet of a nozzle attached to not more than 100 feet of hose.

D. Wet standpipe systems, and dry systems admitting water automatically or by remote control devices located at hose stations shall provide hose stations equipped with 2½ inch and 1½ inch hose connections or with a 2½ x 1½ inch adapter.

E. Where complete reliance for water supply for the standpipe system must be placed on the fire department, a dry standpipe system may be used in which case only a 2½ inch hose connection shall be required at each hose station.

F. For all standpipe systems in 1302.2.D, at least 50 feet but not more than 75 feet of 1½ inch approved fire hose with not larger than ½ inch nozzle shall be supplied at each hose station for the use of the occupants.

G. Where the local fire department requires a 2½ inch hose and the hose is regularly inspected by the fire department, the requirement of 1302.2.F may be waived.

H. Each hose station where hose is required shall be supplied with a hose rack. When the rack is located in hot, dry, dusty or contaminated atmospheres which will cause rapid deterioration of the hose, it shall be enclosed in closets or cabinets.

I. When the fire hazard involved in the use of the building and type of construction does not warrant a constant, automatic water supply to insure fire safety, dry standpipes may be used in buildings up to 75 feet in height.

J. Standpipe systems shall be provided with approved fire department inlet connections.

1302.3 Water Supply.

A. Standpipes shall be of ample size to convey water from any designated source in sufficient quantity to supply the hose streams that are likely to be in simultaneous use and shall be interconnected so that water can flow to any one or combination of risers to deliver its full rated capacity without excessive friction loss.

B. The water supply shall be adequate to meet the demand for the particular hazard and occupancy.

1302.4 Hose Stations. Standpipe risers shall be located so as to permit hose stations to be placed within the allowable distance required from any

point on each floor. Hose stations shall be located where practical within stair enclosures. However, in unlimited area buildings, interior hose stations shall be located in bays at the edge of fire aisles and in multi-story buildings without windows, hose stations shall be located as close as possible to fire department access openings in exterior walls. Hose outlets, valves, hose racks and nozzles when located within a stair enclosure shall not restrict its use as a means of egress.

Sec. 1303.0 Horizontal Fire Lines.

1303.1 When Required. Horizontal fire lines shall be required as follows:

A. As required by Article 7.

B. For moderate hazard occupancies in one story buildings or parts thereof without automatic sprinkler protection which exceed 2½ times the tabular area of Table 401.1.

C. For an increase in area as permitted by installation of a horizontal fire line in accordance with 402.2.A.

1303.2 Design and Construction.

A. Horizontal fire lines shall comply with the requirement for standpipes in 1303.2 as they apply to one story buildings. The fire lines shall be pipes supported on walls or columns with direct hose station take-offs or it may be a system of interconnected risers supplying hose stations, the interconnecting pipe being either below or above the floor, depending upon the location of the water supply source.

B. All hose stations shall be located and equipped as required in 1305.2.

C. The adequacy of water supply shall be determined on the basis of the quantity necessary to supply two hose streams simultaneously for a period of 30 minutes.

D. In areas which are not heated dry fire lines may be used, the water being admitted to the system by use of approved devices actuated automatically by opening a hose valve or through the manual operation of approved remote control devices located at each hose station. Dry fire lines so equipped shall be considered as wet systems.

E. Horizontal fire lines shall be provided with approved fire department connections.

1303.3 Water Supply. The water supply shall be adequate to meet the demand for the particular hazard and occupancy.

Sec. 1304.0 Water Spray Fixed Systems.

1304.1 When Required. Water spray protection shall be provided as follows:

A. To permit an increase in the size of an opening in a fire wall.

B. To permit the elimination of opening protective doors in fire walls, fire partitions and required fire resistive partitions as required by Sec. 507.0, 508.0, and 509.0, and industrial occupancies when a continuous industrial process requires an opening other than for pipes or ducts in a wall or partition.

C. To permit vertical openings in floors of an industrial occupancy to remain open when required by a continuous industrial process.

1304.2 Design and Installation.

A. The design and installation of water spray fixed systems shall comply with accepted engineering practice.

B. Horizontal openings in fire walls and partitions and vertical openings in floors shall not be larger than necessary to give the clearance for the industrial operation for which the opening is designed.

C. For horizontal openings, the water spray installation shall be arranged to provide at least four nozzles on each side to be protected, so directed as to cover the entire opening and controlled by an automatic valve actuated by a heat detector located on the exposed side of the opening. Spray nozzles and heat deflectors shall be provided on both sides when both sides are to be protected. Discharge rates shall be not less than two gallons per square foot of opening per minute. Where severe draft conditions are anticipated, a noncombustible enclosure shall be provided to assure that the spray covers the entire opening.

D. Vertical openings under the same conditions shall be protected from exposure from the floor below as provided in 753.2.C, but shall have an enclosure extending on all sides upward from the floor to beyond the spray nozzles and a draft curtain of 24 inches below and enclosing the sides of the opening.

1304.3 Water Supply. The water supply shall be adequate to meet the demand for the particular hazard and occupancy.

Sec. 1305.0 Yard System.

1305.1 When Required. A yard system of fire hydrants, piped to an adequate water supply, equipped with sufficient hose and supervised by a trained fire brigade shall be provided as follows:

A. In all shipyards, flammable or combustible liquid bulk plants, lumber yards, amusement or exhibition parks and similar occupancies involving high fire and life hazards.

B. When required by Article 7.

C. When required by the Bureau.

1305.2 Design and Construction.

A. The design and installation of yard systems shall comply with accepted engineering practice.

B. Yard systems shall be provided with approved fire department connections.

1305.3 Water Supply. The water supply shall be adequate to meet the demand for the particular hazard and occupancy.

Sec. 1306.0 Chemical or Special Extinguishing Systems.

1306.1 When Required. Chemical or special extinguishing systems shall be provided in buildings and structures and parts thereof designed for uses involving fire and explosion hazards as provided in Article 7.

1306.2 Design and Construction. Chemical or special extinguishing systems shall be designed, constructed and installed in accordance with accepted engineering practice.

Sec. 1307.0 Portable Fire Extinguishers.

1307.1 When Required. Portable fire extinguishers shall be required as provided below:

A. As required by Article 7.

B. Theaters shall be provided with at least two approved fire extinguishers in the stage area where movable scenery is installed. Not less than one fire extinguisher shall be provided on stages or platforms without scenery or stage equipment and one shall be provided in each tier of dressing rooms.

C. Assembly and lecture halls shall be provided with one fire extinguisher for each 2500 square feet of floor area or fraction thereof but not less than one on each occupied floor, including basements, and not less than one fire extinguisher in each laboratory, shop or other vocational room.

D. Buildings in the industrial use group shall be provided with portable fire extinguishers.

E. Buildings in the mercantile use group shall be provided with portable fire extinguishers.

1307.2 Installation. Portable fire extinguishers of the class, rating, and number shall be in accordance with accepted engineering practice.

Sec. 1308.0 Emergency Exhaust Systems.

1308.1 When Used. Emergency exhaust systems may be used in lieu of roof vents where required to exhaust smoke and heat in basements and cellars, floors below the top floor or multi-story buildings, places of assembly using stages equipped with stage lofts, and stairs and exits.

1308.2 Design and Construction.

A. The design and construction and installation of emergency exhaust systems shall be in accordance with accepted engineering practice.

B. The mechanical system may be an exhaust system or an air conditioning or ventilating system provided the recirculation of air can be stopped; provided the fan speed can be increased; and provided fresh air can be introduced.

C. The system shall be activated both manually and automatically.

(1) Manual activation shall be by means of manually operated switches which, together with instructions, shall be placed in a conspicuous place near the principal exit. This may be a locked, transparent breakfront cabinet.

(2) Automatic activation shall be by smoke detectors, abnormal rate of rise temperature controls or other sensing devices. Manual and automatic devices shall, where necessary, close dampers to prevent recirculation of air, activate fans, open outside air supply and exhaust vents. They shall simultaneously transmit an alarm signal to a central station or an internal alarm signal or both when required by the Bureau.

D. Exhaust system ducts shall not pass from one fire area to another without provisions to prevent spread of fire. Ducts and fittings shall be noncombustible and capable of permitting passage of air at temperatures in excess of 250° F.

Sec. 1309.0 Smoke and Heat Venting.

1309.1 When Required. Smoke and heat venting shall be provided as follows:

A. Where the area is increased in accordance with 402.3.

B. In buildings housing severe fire loads as provided in Article 7.

C. In unlimited area buildings as provided by 402.6 and 402.7.

1309.2 Design and Construction.

A. Smoke and heat venting shall comply with accepted engineering practice.

B. Venting may be accomplished by monitors, ridge vents, unit type vents, roof skylights, exterior wall windows, or interior vent shafts.

C. Effective Vent Area. The effective venting area shall be the minimum cross-sectional area of the opening through which the hot gases must pass to reach the outside. In the case of monitors the effective venting area shall be the area of the throat or one side only of vent, whichever is the lesser.

D. Area and Spacing of Vents. All vents shall be uniformly spaced at not more than the maximum distances and not less than the ratios of vent area of Table 1309.2.D.

Table 1309.2.D

	Fire Load		
	Light	Moderate	Severe(1)
Maximum distance between center of vents (feet)	150	120	100
Vent area in sq. ft. per 100 sq. ft. of floor area	.66	1.00	2.00

Note to Table

1. Severe fire loads shall include all combustible storage over 50 pounds per square foot or piled to a height over 15 feet or stacked to a height over 12 feet.

1309.3 Monitors. Monitors may be provided on each side of either sash glazed with plain glass not over ⅛ inch thick, or sash formed by wire glass or other panels arranged to open automatically in event of fire, or louvers arranged to be continuously open or if adjustable arranged to open automatically in event of fire and provide access for fire-fighting.

1309.4 Continuous Gravity Type Ridge Vents. Ridge vents on roofs having a pitch exceeding 3 on 12, which if closable with shutters shall be automatic-opening in event of fire. Where ridge vents are used, provisions shall be made for fire fighting from the exterior. Ridge vents as the sole method of smoke venting are not acceptable when the building exceeds 150 feet in depth and is without adequate means for fighting fires in the interior of the building

1309.5 Unit Type Vents. Unit vents shall be operated to open automatically in event of fire, or so designed that the damper closure breaks or melts and falls out when subjected to temperatures not in excess of 225° F. Approved light transmitting plastic materials used in unit type vents shall comply with 516.2. Vent openings shall be protected by railings not less than 24 inches high or by grilles located below the vent openings, which have openings with a minimum dimension of 6 inches. The grilles shall be capable of supporting a concentrated load of at least 200 pounds at any point. The vent shall be openable from the outside for fire fighting purposes.

1309.6 Roof Skylights. Skylights which are glazed with wired glass to be credited as smoke or heat vents shall be designed to open automatically and provide access for fire fighting in case of fire.

1309.7 Exterior Wall Windows. Windows located in exterior walls near the level of the eaves or ceilings may be used as vents for that portion of the floor area which is not more than 75 feet horizontally from the exterior wall. Windows shall be glazed with ⅛ inch thick plain glass or they shall be designed to open automatically in case of fire. Automatic louvers of equivalent open ventilating area may be used in lieu of windows when designed to provide access for fire fighting.

1309.8 Multi-Story Buildings. In multi-story buildings, floors below the top not provided with adequate exterior wall vents shall be provided with interior vent shafts or with an emergency exhaust mechanical ventilation system which shall have a capacity equivalent to 12 air changes per hour.

1309.9 Curtain Boards.

A. Curtain boards (draft curtains, or fire baffles) shall be used to direct the heat and smoke toward the vents for release. These boards shall be of noncombustible construction capable of withstanding a hose stream. They shall be hung from the roof or ceiling and be of sufficient dimension to create stack action and shall extend at least 6 feet below the roof or ceiling.

B. Curtain boards shall be spaced in accordance with Table 1309.9.B.

Table 1309.9.B

	Fire Load		
	Light	Moderate	Severe
Maximum distance between curtain boards in square feet(1)	250	175	100
Maximum area enclosed in square feet(1)	50,000	35,000	10,000

Note to Table

1. Where monitors or gravity vents are continuous between walls and have a minimum width of 16 feet, curtain boards parallel to the vents may be omitted.

1309.10 AISLES. Aisles shall be located under curtain boards where practical to increase the efficiency of the draft curtain, to provide access for fire fighting and to reduce horizontal spread of fire.

1309.11 DETECTION DEVICES. Each vent shall have a rate of rise temperature device installed so that it will give an alarm to a central fire station when conditions causing the vent to open occur.

SEC. 1310.0 FIRE PROTECTIVE SIGNALING SYSTEMS.

1310.1 WHEN REQUIRED. An approved fire alarm system shall be installed in buildings as follows:

A. High hazard occupancies.

B. Large area industrial buildings, which are unsprinklered or sprinklered without a water flow alarm, in which all areas are not visible from other areas and in which the occupancy load exceeds 100.

C. Industrial buildings exceeding two stories or 30 feet in height, not equipped with an automatic sprinkler system, with an occupancy load exceeding 50 or with more than 25 occupants on any floor above or below grade.

D. Mercantile, industrial and business occupancies with an occupancy load over 25 which are without windows or similar openings and which are in excess of one story in height.

E. Business occupancies which are part of a storage, mercantile or industrial use with an occupant load over 100 above the first floor, and which are unsprinklered when more than six stories or 75 feet in height.

F. Places of assembly when required by Article 7.

1310.2 CONNECTION TO CENTRAL STATION.

A. Protective signaling systems shall be connected to a fire station or to a fire alarm headquarters in:

(1) Special hazard occupancies as required by Article 7.

(2) Places of assembly in F-1 use group that has an occupancy load exceeding 300.

B. Protective signaling systems shall be capable of automatic or manual notification of the municipal fire department, when required by the Bureau, in:

(1) Buildings over two stories in height which are without windows or equivalent openings.

(2) Buildings having more than 50 occupants above or below the first floor.

1310.3 DESIGN AND CONSTRUCTION.

A. The design and installation of fire protective signaling systems shall be in accordance with accepted engineering practice.

B. Where a building is divided by fire walls, each fire area may be considered a separate building.

C. Alarm systems and their components shall be supervised and tested at not greater than monthly intervals.

D. Required sound or visible signaling devices shall be used for fire alarm purposes only, except when permitted by the Bureau.

E. Coded signals may be used when approved by the Bureau.

F. Alarm sending stations (fire alarm boxes) when manually operated shall be located in the normal path of travel to an exit and shall not be more remote from any place than 200 feet.

SEC. 1311.0 FIRE DETECTION SYSTEMS.

1311.1 WHEN REQUIRED. Fire detection systems used to activate alarms, fans, doors, motors, fire extinguishing systems, protective devices, or other equipment shall be provided when required by Article 7 or the Bureau.

1311.2 WATER-FLOW ALARM SIGNALS. A water-flow alarm signal provided with any automatic sprinkler system may be used in lieu of an automatic fire detection system.

1311.3 AUTOMATIC FIRE ALARM SYSTEMS. Fire detection systems used to activate alarm signals automatically may be used for other incidental fire-protection or fire extinguishing functions.

SEC. 1312.0 FIRE EXIT DRILLS AND FIRE BRIGADES.

1312.1 WHEN REQUIRED. The owner or tenant of a building shall provide for a fire brigade and fire exit drills in unlimited area buildings.

1312.2 Organization.

A. Fire brigades and fire exit drills shall be organized in accordance with accepted engineering practice.

B. The proposed organizational plan, its equipment, and fire fighting crew shall be developed in conjunction with the fire department having jurisdiction and shall be submitted to the Bureau for approval.

Sec. 1313.0 Auxiliary Fire Fighting Equipment.

1313.1 When Required. First-aid fire-extinguishing equipment, including hand hose, water barrels, buckets, chemical engines, pumps, axes, hooks, ladders, other appliances, and tools for controlling and fighting fire shall be provided when required by Article 7.

1313.2 Installation.

A. All hand operated auxiliary fire-extinguishing equipment shall be suitable to the occupational use of the building and shall be installed in corridors or other locations, visible and readily accessible to the occupants of the building.

B. Auxiliary fire fighting equipment shall be approved and shall be in accordance with accepted engineering practice.

1313.3 Interior Cabinets. Cabinets enclosing auxiliary fire fighting equipment shall be of noncombustible construction equipped with readily openable keyless doors or with readily-broken glass access panels.

Sec. 1314.0 Fire Department Connections.

1314.1 When Required. Sprinkler systems except partial systems, standpipe systems, horizontal fire lines and yard systems installed where there is a public fire department, shall be provided with approved fire department inlet connections and so marked.

1314.2 Installation.

A. Fire department connections shall not project beyond the street or property line nor shall they be less than 18 inches nor more than 36 inches above adjoining grade.

B. A fire department connection shall be provided for each fire protection system provided within the building located so as to be accessible to the fire department. No connection shall be farther than 150 feet to a corner, the adjacent side of which is not accessible, and all connections when measured around the accessible perimeter of the building shall be not more than 300 feet apart.

Sec. 1315.0 Adequacy of Fire Fighting Equipment.

1315.1 Approved Equipment. The Bureau may accept as evidence of approval, the label or listing in a publication of a nationally recognized testing agency in accordance with accepted engineering practice. When installed in accordance with the limitations of the listing, such systems, devices and equipment shall be deemed to comply with this Article 13 for the purposes specified.

1315.2 Exceptions to Fire Fighting Requirements.

A. Buildings in which the use of fire protection equipment would be dangerous or detrimental to the specific use and occupancy shall be exempt from Article 13 when approved by the Bureau.

B. The accepted engineering practices shall be used as a guide to determine when a particular type of extinguishment should not be used.

C. When the usual type of extinguishment cannot be used, the Bureau shall require equivalent protection by means that will assure the fire safety of the specific use and occupancy.

1315.3 Maintenance.

A. All fire fighting equipment including valves, hoses, tools and accessories shall be maintained readily available and in good working order at all times for immediate use of the occupants of the building and the fire department.

B. The owner or tenant of every building and structure shall be responsible for the care and maintenance of all fire extinguishing equipment and devices to insure the safety and welfare of the occupants. Maintenance shall be in accordance with accepted engineering practice.

1315.4 Inspections and Tests.

A. Inspections and field tests of fire extinguishing equipment shall be made by the owner to demonstrate the suitability of the system for fire department use.

B. Inspections and tests shall be in accordance with accepted engineering practice. A written record of inspections and tests shall be maintained by the owner and such record shall be available for examination by the Bureau for a period not exceeding two years.

ARTICLE 14

ELEVATORS, ESCALATORS, DUMBWAITERS, LIFTS, AND CONVEYOR EQUIPMENT

Sec. 1400.0 Scope.

This Article of the code shall apply to the design, construction, installation, maintenance and operation of all elevators, escalators, moving walks, dumbwaiters, special lifts, and hoisting and conveying equipment.

Sec. 1401.0 Elevators.

1401.1 Construction and Operation. Construction, installation and operation of all elevators shall comply with accepted engineering practice.

1401.2 Designated Operator. Every power elevator except automatic and continuous-pressure operation types and sidewalk elevators shall be in charge of a designated operator.

1401.3 Fire Department Use. In every building over 150 feet in height, an elevator shall be available at all times to permit fire department access to any floor in the building or structure served by elevators.

1401.4 Passenger Restrictions in Freight Elevators.

A. Except as provided in 1401.4.C, no person other than the operator or those individuals necessary to handle freight shall ride on any elevator other than a passenger elevator.

B. The owner or other responsible person shall not permit any individual other than the operator or those individuals necessary to handle freight to ride on any elevator other than a passenger elevator, except as provided in 1401.4.C.

C. Employees of the owner or leasee may ride on a freight elevator, when approved by the Bureau.

1401.5 Shaft Enclosures.

A. All elevator hoistways shall be enclosed in accordance with Article 5, except that shafts in other than high hazard buildings that do not connect more than 2 floors need not be vented.

B. When new installations or major alterations to an existing shaft are contemplated, the altered shaft shall comply with this Article.

Sec. 1402.0 Escalator.

1402.1 Construction and Operation. The construction and operation of escalators shall conform to accepted engineering practice.

1402.2 Enclosures. All escalator enclosures shall afford the fire resistance required by Article 5.

Sec. 1403.0 Dumbwaiters.

1403.1 Construction and Operation. The size, construction and operation of hand and power driven dumbwaiters shall conform to the accepted engineering practice, except as provided in Sec. 1103.3.

1403.2 Enclosures. The enclosures for all dumbwaiters shall comply with Article 5.

1403.3 Industrial Dumbwaiters. In industrial and storage buildings an oversized dumbwaiter may exceed the limits of 1403.1 with maximum platform size being limited to 16 square feet, the capacity limited to 1000 lbs., with a 4 foot high enclosure.

Sec. 1404.0 Short Rise Material Lifts.

1404.1 Construction and Operation. The construction, installation and operation of all power material lifts shall comply with accepted engineering practice.

1404.2 Rated Load and Speed. The design lifting capacity of material lifts shall be adequate to lift the rated loads within the limitations of working stresses prescribed in this code but in no case less than 50 pounds per square foot uniformly distributed over the gross platform area. A metal sign shall be securely attached to the lift or immediately adjacent thereto, stating the approved rating capacity.

1404.3 Platform Construction. The platform and its supports shall be of approved construction designed for the loads to be transmitted within the strength and deflection limitations. When one half the capacity load is applied as a static center concentration within 12 inches of the loading edge, the lift platform shall not deflect more than one half inch at any edge point.

1404.4 Lift Protection. All material lifts shall be protected by either enclosing the shaftway or providing platform protection.

A. Enclosure Protection. No protection is required for the platform if the shaftway is completely and continuously enclosed and the landing gates at all levels including the floor level are equipped with an

electrical contact which will prevent operation of the gate unless the lift is at that level.

B. Platform Protection. If the shaftway is not completely and continuously enclosed, then the following protection is required:

(1) When the lift rise is not more than 5 feet, an approved toe guard shall be provided underneath the platform on all unprotected sides to a depth of not less than 8 inches sloping at an angle of not more than 30 degrees to the vertical.

(2) For automatic or machine feed operation, or when the lift rise exceeds 5 feet, an approved metal skirt shall be provided attached to the underside of the platform and extending down on all unprotected sides to guard the exposed vertical opening when the platform is at full rise.

(3) When the rise exceeds 5 feet, all sides of the platform not used for loading shall be protected with approved noncombustible rails or mesh to a height of not less than 3½ feet.

1404.5 Overload Safeties. Approved automatic safeties shall be provided for electric or hydraulic operation to prevent overload in excess of 20 percent of the rated capacity.

1404.6 Operation of Material Lifts.

A. Lift Control. An approved device shall be provided of either the continuous-pressure or dead-man type that will stop the platform within a travel distance of not more than 2 inches.

B. Stop Buttons. When the operation of the lift is interlocked with the operation of a machine or other mechanical conveyor device, an emergency set of up, down and stop buttons shall be provided so located that the operator has full view of the lift and operating area at all times.

1404.7 Material Lift Pressure Tanks. Pressure tanks for hydraulic operation shall conform to the requirements of the Mechanical Inspection Bureau and shall be marked with a securely attached metal label to indicate the approved operating pressure. The maximum operating pressure of any hydraulic system shall not exceed 350 pounds per square inch.

Sec. 1405.0 Conveyors.

1405.1 Construction and Operation. The construction and operation of conveyors shall conform to Chapter 140, Conveyors and Cableways of Title 12, N.J.A.C.

1405.2 Enclosures. All conveyors connecting successive floors or levels shall be enclosed in fire-resistive construction in accordance with Article 5.

1405.3 Machinery Guards. Adequate protection shall be provided around all power driven moving parts of every conveying device.

1405.4 Conveyor Safeties. All power-operated conveyors, belts and other material moving devices, shall be equipped with automatic limit switches which will shut off the power in emergency and automatically stop all operation of the conveyors.

1405.5 Other Classification. Equipment utilizing platforms for material handling and not classified as a dumbwaiter or short rise lift shall be classified as a freight elevator if they are installed at an angle exceeding 45 degrees with the horizontal.

Sec. 1406.0 Automotive Lifts.

1406.1 Construction and Operation. The construction and operation of all electric, hydraulic and hydro-pneumatic automotive lifts shall comply with accepted engineering practice.

1406.2 Wheel Chocks. Approved wheel stops shall be provided to prevent the vehicle from rolling off a roll-on type automotive lift while the lift is in a raised position.

1406.3 Safeties.

A. Limit Stop. Every mechanical automotive lift shall be equipped with an approved automatic means to stop the lifting frame before it reaches safe limits of travel.

B. Holding Brake. When the friction of the gear chain of the driving mechanism is insufficient to hold the load, the automotive lift shall be equipped with a brake or other approved locking device to automatically hold the platform at any level immediately on failure of the lifting power for any cause.

C. Stopping Brake. When the structural members of the lifting frame are so designed that they interfere with open doors or other projections from the vehicle, the automotive lift shall be provided with a quick-acting automatic brake to stop the ascent of the platform in case of emergency.

1406.4 Controls.

A. Automatic Release. The direct control device shall be of a type that will automatically return to the neutral or off position upon release by the operator for any other cause.

B. Location. All control devices for lowering the lift shall be accessible to the operator without exposing him to danger.

C. Speed Control. A speed control device shall be provided to control descent of the platform at a speed of not more than 20 feet per minute under rated load.

Sec. 1407.0 Acceptance Tests.

Acceptance tests and inspections shall be required on all new, relocated and altered equipment. The tests and inspections shall be of such a nature as to determine whether the entire installation is designed, constructed and installed in compliance with this Article.

ARTICLE 15

SIGNS AND OUTDOOR DISPLAY STRUCTURES

Sec. 1500.0 Scope.

This Article of the code shall govern the construction, erection and maintenance of all signs and outdoor display structures of any kind or description with respect to safety, structural adequacy, size, attachment and anchorage.

Sec. 1501.0 Location.

1501.1 Non-Interference.

A. No sign shall be erected, constructed or maintained so as to obstruct any exterior stair or fire escape, or any window or door, or access opening used as a means of egress or for fire fighting purposes, or as to prevent free passage from one part of a roof to any other part thereof.

B. No sign shall be attached in any form, shape or manner to a balcony, an exterior stair or a fire escape, or be so placed as to interfere with any required opening for ventilation.

1501.2 Materials.

A. Signs not connected to any building shall be constructed of material having a flame spread rating of 100 or less according to 503.1, but no part of such combustible material shall be nearer than 18 inches from any exterior building wall.

B. Signs erected on the roof or facade of a building shall be constructed of noncombustible materials except for isolated signs of not more than 20 square feet in area and flat against an exterior wall.

Sec. 1502.0 Use of Plastics.

Approved plastics may be used as facing materials and as letters and decoration on signs or outdoor display structures.

Sec. 1503.0 Structural and Fire Protective Requirements.

All structural, fire protective, erection, type, height and projection limitations, electrical equipment and other requirements shall be in accordance with Articles 5 and 8 and accepted engineering practice.

Sec. 1504.0 Maintenance and Inspection.

1504.1 Proper Repair. All signs together with their supports, braces, anchors, and attachments to other structures shall be kept in repair and in the proper state of preservation. The Bureau may order the removal of any sign that is not maintained in accordance with this Article.

1504.2 No Interference. No signs shall be located so as to interfere with free access for maintenance purposes.

1504.3 Proper Safeguards. Where periodic inspection and maintenance procedures are required, proper safeguards shall be provided to protect employees engaged in this activity.

1504.4 Inspection. The Bureau shall inspect every sign for which an approval is required, and reinspect such signs every two years, when application for such reinspection is made by the owner.

ARTICLE 16

SAFEGUARDS DURING DEMOLITION AND CONSTRUCTION

Sec. 1600.0 Scope.

This Article of the code shall apply to all construction operations in connection with the erection, alteration, repair, removal or demolition of buildings and structures.

Sec. 1601.0 Employer Work.

Construction work performed by an employer subject to the Worker Health and Safety Act shall be conducted in accordance with Chapter 116, Maintenance, Construction, and Demolition of Title 12, N.J.A.C.

Sec. 1602.0 Contractor Work.

Construction work performed by a contractor subject to the Construction Safety Act shall be conducted in accordance with Chapter 180, Construction Safety Code of Title 12, N.J.A.C.

Part 2

Construction Safety Act

Chapter 180. Construction Safety Code—7/1/68.

Part 3

Mine Safety Act

Chapter 185. Pits and Quarries—2/15/60.

Part 4

Explosives Act

Chapter 190. Explosives Permits and Fees—1/15/62.*
Chapter 191. Transportation of Explosives—12/14/62.*
Chapter 192. Storage of Explosives—8/20/65.*
Chapter 193. Use of Explosives—8/20/65.*
Chapter 194. Rocket Experimentation by Amateurs—11/1/63.

Part 5

Liquefied Petroleum Gas Act

Chapter 200. Liquefied Petroleum Gas—8/15/69.

Part 6

Transportation of Dangerous Articles Act

Chapter 205. Transportation by Motor Carrier of Dangerous Articles—9/11/50.

Note to List

* Chapters 190, 191, 192, and 193 are published as one bound document.

(*Continued on back cover*)

Law Reprints

Construction Safety Act—P. L. 1962, c. 45
Explosives Act—P. L. 1960, c. 55
Fireworks Regulation Law—P. L. 1930, c. 42 and P. L. 1937, c. 51
High Voltage Proximity Act—P. L. 1948, c. 249 and P. L. 1966, c. 261
Liquefied Petroleum Gas Act—P. L. 1958, c. 43
Mine Safety Act—P. L. 1954, c. 197
Railroad and Airline Sanitation—P. L. 1966, c. 112
Railroad Diesel Locomotive Ventilation—P. L. 1966, c. 119
Transportation of Dangerous Articles—P. L. 1950, c. 128
Worker Health and Safety Act—P. L. 1965, c. 154

Other Publications

Annual Analysis of Work Injuries in New Jersey

AVAILABILITY OF PUBLICATIONS

All publications are distributed free except as follows:

1. There is a charge of $1.00 per copy for Chapter 115, Building Code.
2. There is a charge of 50¢ per copy for Chapter 180, Construction Safety Code.
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