NFPA No.
101
File: 100 Series
Safety to Life

NFPA HISTORICAL

BUILDING EXITS CODE

Fifteenth Edition, 1958

Price $1.50

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NATIONAL FIRE PROTECTION ASSOCIATION
International
60 Batterymarch Street, Boston 10, Mass., U.S.A.

3M-6-58-FP-PP

Printed in U.S.A.

National Fire Protection Association

International

Executive Office: 60 Batterymarch St., Boston 10, Mass.

The National Fire Protection Association was organized in 1896 to promote the science and improve the methods of fire protection and prevention, to obtain and circulate information on these subjects and to secure the cooperation of its members in establishing proper safeguards against loss of life and property by fire. Its membership includes two hundred national and regional societies and associations (list on outside back cover) and seventeen thousand individuals, corporations, and organizations. Anyone interested may become a member; membership information is available on request.

This pamphlet is one of a large number of publications on fire safety issued by the Association including periodicals, books, posters and other publications; a complete list is available without charge on request. All NFPA standards adopted by the Association are published in six volumes of the **National Fire Codes** which are re-issued annually and which are available on an annual subscription basis. The standards, prepared by the technical committees of the National Fire Protection Association and adopted in the annual meetings of the Association, are intended to prescribe reasonable measures for minimizing losses of life and property by fire. All interests concerned have opportunity through the Association to participate in the development of the standards and to secure impartial consideration of matters affecting them.

NFPA standards are purely advisory as far as the Association is concerned, but are widely used by law enforcing authorities in addition to their general use as guides to fire safety.

Definitions

The official NFPA definitions of shall, should and approved are:

SHALL is intended to indicate requirements.

SHOULD is intended to indicate recommendations, or that which is advised but not required.

APPROVED refers to approval by the authority having jurisdiction.

Units of measurements used here are U. S. standard. 1 U. S. gallon = 0.83 Imperial gallons = 3.785 liters.

Approved Equipment

The National Fire Protection Association does not "approve" individual items of fire protection equipment, materials or services. The standards are prepared, as far as practicable, in terms of required performance, avoiding specifications of materials, devices or methods so phrased as to preclude obtaining the desired results by other means. The suitability of devices and materials for installation under these standards is indicated by the listings of nationally recognized testing laboratories, whose findings are customarily used as a guide to approval by agencies applying these standards. Underwriters' Laboratories, Inc., Underwriters' Laboratories of Canada and the Factory Mutual Laboratories test devices and materials for use in accordance with the appropriate standards, and publish lists which are available on request.

Building Exits Code

A Code for Public Safety from Fire

Fifteenth Edition

NFPA No. 101 — 1958

This, the Fifteenth Edition of the Building Exits Code, was adopted by the National Fire Protection Association on May 21, 1958 on recommendation of the NFPA Committee on Safety to Life. It supersedes the Fourteenth Edition, 1957, and also supersedes NFPA Standards on Existing Nursing, Convalescent and Old Age Homes, No. 101B, 1955, and Standards on Classification of Interior Finish, No. 101C, 1955 and 1956.

Changes in this edition are outlined on page 101–8.

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FOREWORD

The Building Exits Code as printed herewith had its origin in the work of the Committee on Safety to Life of the National Fire Protection Association which was appointed in 1913. For the first few years of its existence the committee devoted its attention to a study of the notable fires involving loss of life, such as the Binghamton Clothing Factory fire, the Iroquois Theatre fire, the Collinwood School fire, the Triangle Shirtwaist Company fire, the Arcadia Lodging House fire, and other similar disasters, analyzing the causes of this loss of life. This work led to the preparation of standards for the construction of stairways, fire escapes, etc., for fire drills in various occupancies and for the construction and arrangement of exit facilities for factories, schools, etc., which form the basis of the present code. These reports were adopted by the National Fire Protection Association and published in pamphlet form as "Outside Stairs for Fire Exits" (1916) and "Safeguarding Factory Workers from Fire" (1918). A pamphlet, "Exit Drills in Factories, Schools, Department Stores and Theatres," published in 1912 following its presentation by the late committee member, Mr. R. H. Newbern, at the 1911 annual meeting of the Association, although antedating the organization of the Committee, is considered as having the status of a Committee publication and has been used with the other pamphlets as a groundwork for the present Code. These pamphlets were widely circulated and put into quite general use.

In 1921 the Committee was enlarged to include representation of certain interested groups not previously participating, and work was started on the further development and integration of previous Committee publications to provide a comprehensive guide to exits and related features of life safety from fire in all classes of occupancy, to be known as the Building Exits Code. Various drafts were published, circulated and discussed over a period of years and the first edition of the Building Exits Code under this title was published by the National Fire Protection Association in 1927. Thereafter the Committee continued its deliberations, adding new material on features not originally covered, and revising various details in the light of fire experience and practical experience in the use of the Code. New editions were published at intervals to incorporate the amendments adopted by the National Fire Protection Association on recommendation of the Committee.

The Cocoanut Grove Night Club fire in Boston in 1942 in which 492 lives were lost focused national attention upon the importance of adequate exits and related fire safety features. Public attention to exit matters was further stimulated by the series of hotel fires in 1946 (LaSalle, Chicago — 61 dead; Canfield, Dubuque — 19 dead; and the Winecoff, Atlanta — 119 dead). The Building Exits Code thereafter was used to an increasing extent for legal regulatory purposes. However, the Code was not in suitable form for adoption in law as it had been drafted as a reference document containing many advisory provisions useful to designers of buildings, but not appropriate for legal use. This led to a decision by the committee to re-edit the entire Code limiting the body of the text to requirements suitable for mandatory application and placing advisory and explanatory material in notes. The re-editing also involved adding to the Code provisions on many features which had not previously been covered in order to produce a complete document. Preliminary work on the complete re-editing and enlargement of the Code was carried on concurrently with certain necessary current revisions which appeared in the 1948, 1949, 1951 and 1952 editions. The results were incorporated in the 1956 Edition, and further refined in the 1957 and 1958 Editions.

In the course of preparation of the current edition, the committee considered various suggestions to the effect that the Building Exits Code should be so drafted that it would be suitable for use as a chapter on exits in a municipal building code. These suggestions proved impracticable because the form, arrangement and detailed classification of occupancies vary so widely among different building codes that it would be impossible to develop any single treatment of exit matters which could be suitable for integration in building codes generally or even in the principal model building codes. The Building Exits Code, therefore, must stand as an independent document, but has been drafted with the idea of minimizing conflicts or difficulties where the Building Exits Code is applied concurrently with a municipal building code. An effort has been made in the Building Exits Code to minimize construction requirements which are not essential to exit safety particularly in respect to features which are ordinarily covered by city building codes as well as by recognized architectural practice.

In all of the work in developing the various sections of the Building Exits Code the groups particularly concerned have been consulted. Reports have been published by the NFPA for review by all concerned and have been discussed and adopted in

the annual meetings of the NFPA which now includes 200 national, international and regional technical, professional and trade associations and 17,000 individual members. Records of the discussions and action taken by the NFPA will be found in the published Proceedings and Advance Reports.

The Committee welcomes comments and suggestions on the Building Exits Code. Any reader may file a request for consideration of changes. Such requests should be filed in writing, giving specific proposals and supporting data. For consideration in any given committee year they must be filed not later than January 2.

The Committee

The NFPA Committee on Safety to Life has enjoyed an unusual degree of continuity of membership over the years. One of the present active members of the Committee, Henry B. Cross, has served continuously since the Committee was organized in 1913.

The Committee has functioned under the leadership of the following chairmen, with connections indicated as of the period of chairmanship.

1913–1923	H. Walter Forster Consulting Fire Protection Engineer
1924–1925	Sidney J. Williams (died 1956) National Safety Council
1926–1929	Elisha S. Chapin (died 1957) Pennsylvania Dept. of Labor and Industry
1930–1937	John Irwin Bright (died 1937) Architect
1937–	Francis R. Scherer School Architect and Administrator

The Committee has been served as Secretary by Robert S. Moulton of the NFPA Staff since 1921.

Over the years changes in personnel have been made as necessary to keep the membership active, up-to-date, and to maintain balanced representation of the various groups participating. The Committee list published here is current as of the date of the latest Committee action on the Building Exits Code. Prior to 1955 three associations of producers of building materials were represented on the Committee. As a result of increasing pressure

for additional representation from other competing building material groups, and the impossibility of according equal representation to all of the large number of competing interests without having a committee of unwieldy size and lacking proper balance, it was decided by the NFPA Board of Directors in 1955 to transfer all building material representation to a separate Committee on Building Materials, to serve as a vehicle for liaison. Through their representation on the NFPA Committee on Building Materials the following have been consulted and have had opportunity to register their suggestions, many of which have been incorporated in the present edition of the Building Exits Code.

Acoustical Materials Association
American Institute of Steel Construction, Inc.
American Institute of Timber Construction
American Iron and Steel Institute
American Wood-Preservers' Association
Asbestos-Cement Products Association
Asphalt Roofing Industry Bureau
Canadian Institute of Timber Construction
Douglas Fir Plywood Association
Gypsum Association
Insulation Board Institute
Metal Lath Manufacturers Association
Metal Roof Deck Technical Institute
National Bureau for Lathing and Plastering
National Lumber Manufacturers' Association
National Mineral Wool Association
Red Cedar Shingle Bureau
Sheet Metal Contractors' National Association
Vermiculite Institute

Editions of the Building Exits Code

The following is a record of the dates of successive editions of the Building Exits Code and predecessor or supplementary publications, not including drafts circulated for criticism:

1911 Exit Drills

1916 Outside Stairs for Fire Exits

1918 Safeguarding Factory Workers from Fire

1927 First Edition — Building Exits Code

1929 Second Edition

1934 Third Edition

1936 Fourth Edition

1938 Fifth Edition

1939 Sixth Edition

1942 Seventh Edition

1946 Eighth Edition

1948 Ninth Edition

1949 Tenth Edition

1951 Eleventh Edition

1952 Twelfth Edition

1955 Nursing Homes (101B)
Interior Finish (101C)

1956 Interior Finish (101C) Thirteenth Edition

1957 Fourteenth Edition

1958 Fifteenth Edition

Interpretations

Those who after diligent study of the Building Exits Code are in doubt as to the meaning or intent of some specifically identified section or paragraph may write to the Secretary of the Committee for an interpretation.

Communications must be sent in five identical copies including five copies of any plans or sketches. Interpretation requests shall deal only with a single subject; if more than one subject is to be covered, a separate request for an interpretation should be filed on each paragraph. If the question involves an actual field situation, all parties at interest shall be identified by name and address.

Requests for interpretations must deal with questions as to the meaning of the Building Exits Code. Questions of architectural or engineering design which could be answered by a study of the Building Exits Code will not be answered.

CHANGES IN 1958 EDITION

2332. Editorial revision to clarify meaning of "fire alerting system."

2440 and 2464. Revised to include Class A interior finish wherever Class B is permitted and Class A or B interior finish wherever Class C is indicated.

2479. New paragraph covering transoms in dormitories similar to paragraph on the same subject in section on Hotels.

2495. Revised to specify area of 432 sq. in. clear opening space of window from sleeping room. Note revised to recommend that quick opening devices be provided where storm windows, screens or burglar guards are used.

2560. New paragraph to require interior finish of exits of stores to be in accordance with Section 44.

2655. Revised to allow Class B interior finish in exits and enclosed corridors of new buildings.

3126. Editorially revised for clarification of intent.

3532. Correction of an error in design of load for balconies and stairs.

4441. Broadened by eliminating specific reference to types of interior finish.

4451. Editorial revision to clarify intent.

Other minor editorial changes have been made in the following paragraphs: 3022, 3342, 5201, 5202, 5203 and 5311.

BUILDING EXITS CODE 15th EDITION

Contents

INTRODUCTION

1. This Code deals with public safety from fire and like emergencies. It specifies the number, size and arrangement of exit facilities sufficient to permit prompt escape of occupants from buildings or structures in case of fire or other condition dangerous to life. It covers construction, protection and occupancy features to minimize danger to life from fire, smoke, fumes or panic before buildings are vacated. The Code recognizes that life safety is more than a matter of exits and accordingly deals with various matters besides exits which are considered essential to life safety, and, in some cases, specifies limits beyond which the hazard is so great that no practical amount of exits can give assurance of any reasonable safety.

2. Absolute safety from fire is not practically attainable; the objective of this Code is to specify measures which will provide that degree of public safety from fire which can be reasonably required. The Code endeavors to avoid requirements which might involve unreasonable hardships or unnecessary inconvenience or interference with normal use and occupancy of buildings, but insists upon compliance with minimum standards for fire safety necessary in the public interest, even though a financial hardship may be involved in some individual cases.

3. This Code does not attempt to cover general fire prevention or building construction features such as are commonly dealt with in fire prevention codes and building codes, nor to protect the individual from the results of his own careless acts such as smoking in bed.

4. Exits from vehicles, vessels or other mobile structures are not covered by this Code except that when in fixed locations and occupied as buildings they are treated as buildings in regard to exit requirements.

5. Neither the prevention of accidental personal injuries during the course of normal occupancy of buildings, nor the preservation of property from loss by fire has been considered as the basis for any of the provisions of this Code, but many of the requirements of the Code will incidentally contribute towards these objectives.

6. The Building Exits Code recognizes that panic in a burning building may be uncontrollable, but deals with the potential panic hazard through measures designed to prevent the development of panic. Experience indicates that panic seldom develops,

even in the presence of potential danger, so long as occupants of buildings are moving towards exits which they can see within a reasonable distance with no obstructions or undue congestion in the path of travel. However, any uncertainty as to the location or adequacy of means of exit, the presence of smoke, or stoppage of exit travel, such as may occur when one person stumbles and falls on stairs, may be conducive to panic. Panic danger is greatest when there are numbers of people in a confined area.

Scope and Applications

11. The official scope statement for the Building Exits Code is: "This Code covers the construction, arrangement and use of exit facilities necessary to provide safe means of egress from structures, together with such features of construction and protection as have bearing on safety of egress."

12. This Code covers both new and existing construction. In various sections of the Code there are specific provisions for existing structures differing from those for new construction. Except in so far as specifically thus provided, all requirements of the Code apply to existing as well as to new construction.

Basis

21. The provisions of this Code are based upon fires in which major loss of life has occurred over a long period of years, with an analysis of those features primarily responsible for fire fatalities, supplemented by studies of the conditions of occupancy of buildings and the manner of use of exit facilities, together with such test and research data as have been available. Psychological as well as physical factors have been considered, as fire experience shows that many of the fire tragedies of history cannot be completely explained by physical factors alone. Details which have necessarily been established on a basis of engineering judgment in the absence of specific factual data have been checked in relation to actual fire experience, recognized architectural practice and long-existing legal requirements.

22. The present text incorporates the same basic provisions that have appeared in previous editions, but with different editorial treatment. All of the text is subject to continuing study by the committee with a view to making further improvements in future editions.

Chapter I
GENERAL PRINCIPLES

SECTION 10. FUNDAMENTAL REQUIREMENTS

This section is a statement of general principles which may be used as a basis for decision on details not specifically covered elsewhere in the Building Exits Code, and which may be found suitable for legal enactment (omitting fine print notes) where it is desired to adopt the Building Exits Code by short form enactment without incorporating all details in law.

1001. Every building or structure, new or old, designed for human occupancy shall be provided with exits sufficient to permit the prompt escape of occupants in case of fire or other emergency. The design of exits and other safeguards shall be such that reliance for safety to life in case of fire or other emergency will not depend solely on any single safeguard; additional safeguards shall be provided for life safety in case any single safeguard is ineffective due to some human or mechanical failure.

1002. Every building or structure shall be so constructed, arranged, equipped, maintained and operated as to avoid undue danger to the lives and safety of its occupants from fire, smoke, fumes or resulting panic during the period of time reasonably necessary for escape from the building or structure in case of fire or other emergency.

1003. Exits shall be provided of kinds, numbers, location and capacity appropriate to the individual building or structure, with due regard to the character of the occupancy, the number of persons exposed, the fire protection available, and the height and type of construction of the building or structure, to afford all occupants convenient facilities for escape.

1004. Exits shall be so arranged and maintained as to provide free and unobstructed egress from all parts of every building or structure at all times when the building or structure is occupied. No locks or fastenings to prevent free escape from the inside of any building shall be installed except in mental, penal or corrective institutions where supervisory personnel is continually on duty and effective provisions are made to remove occupants in case of fire or other emergency.

See par. 2302 for details of locking exits in institutions.

1005. Exits shall be clearly visible or the routes to reach them shall be conspicuously indicated in such a manner that every oc-

cupant of every building or structure who is physically and mentally capable will readily know the direction of escape from any point, and each path of escape, in its entirety, shall be so arranged or marked that the way to a place of safety outside is unmistakable. Doorways or passageways not constituting exits or ways to reach exits, but of such a character as to be subject to being mistaken for exits, shall be so arranged or marked as to minimize their possible confusion with exits and the resultant danger of persons endeavoring to escape from fire finding themselves trapped in dead-end spaces, such as cellars or storerooms, from which there is no other way out.

1006. In buildings or structures equipped for artificial illumination, adequate and reliable illumination shall be provided for all exit facilities.

1007. In all buildings or structures of such size, arrangement or occupancy that a fire may not itself provide adequate warning to occupants, fire alarm facilities shall be provided where necessary to warn occupants of the existence of fire so that they may escape or to facilitate the orderly conduct of fire exit drills.

1008. Every building or structure, section, or area thereof of such size, occupancy and arrangement that the reasonable safety of numbers of occupants may be endangered by the blocking of any single means of egress due to fire or smoke, shall have at least two means of egress remote from each other, so arranged as to minimize any possibility that both may be blocked by any one fire or other emergency conditions.

Chapter II generally requires at least two exits, but specifies conditions where one means of egress is all that can reasonably be required in the interest of public safety.

1009. All vertical ways of exit and other vertical openings between floors of buildings shall be suitably enclosed or protected as necessary to afford reasonable safety to occupants while using exits and to prevent spread of fire, smoke or fumes through vertical openings from floor to floor before occupants have entered exits.

1010. The enforcing authority shall determine the adequacy of exits and other measures for life safety from fire covered in the preceding paragraphs in accordance with the provisions of Chapters II, III, IV, V and VI of the Building Exits Code. In cases of practical difficulty or unnecessary hardship, the enforcing authority may grant exceptions from this Code, but only when it is clearly evident that reasonable safety is thereby secured.

1011. Existing buildings and structures shall not be occupied or used in violation of the provisions of this Code applicable thereto.

1012. No changes or alterations shall be made in any building or structure, whether new or existing, except in conformity with the provisions of this Code, and no change of occupancy, whether necessitating physical alterations or not, shall be made in any building or structure, unless such building or structure conforms with the requirements of this Code applying to new buildings of the proposed new use.

1013. Nothing in this Code shall be construed to prohibit better types of building construction, more exits, or otherwise safer conditions than the minimum requirements specified in this Code.

1014. In any case where two or more separate provisions of this Code dealing with the same features are applicable to any given situation, the lesser of differing requirements shall be the minimum for the purpose of this Code, unless otherwise specified by the enforcing authority.

Example: If a small building consists only of a single room, and the size and conditions of occupancy of the room are such that a single door is acceptable for the room, a single exit will be acceptable for the building even though there is a general requirement for two exits for buildings.

1015. Where the Building Exits Code is applied concurrently with any other code legally applicable to building construction features also covered in the Building Exits Code, the enforcing authority may waive building construction provisions of the Building Exits Code to such extent as necessary to avoid violation of such other code, provided that the fundamental principles set forth in Section 10 of the Building Exits Code shall not be waived and that in no case shall the resultant requirements be less than the minimum requirements of the Building Exits Code for existing buildings.

This paragraph is intended to avoid situations where due to technical conflicts it might be impossible to erect a building to comply with both codes. It does not apply to cases where provisions differ but the Building Exits Code may be followed without any violation of the other code, as, for example, a case where another code might permit open stairways but the Building Exits Code requires enclosure.

1016. Compliance with this Code shall not be construed as eliminating or reducing the necessity for other provisions for safety of persons using a structure under normal occupancy conditions nor shall any provision of the Code be construed as requiring or permitting any condition that may be hazardous under normal occupancy conditions.

SECTION 11. POPULATION

1101. The population of buildings or structures, for the purpose of determination of the required exits, shall be the maximum number of persons that may be in the building or structure at any time as determined by the enforcing authority, but not less than the number computed in accordance with par. 1102, so that exits will be sufficient to accommodate the maximum population that may be anticipated under any reasonably foreseeable condition.

The normal designed occupancy load is not necessarily a suitable criterion, as the greatest hazard may occur when an unusual crowd is present, a condition often difficult for enforcing authorities to control by regulatory measures. The principle of this Code is to provide exits for the maximum probable number of occupants, rather than to attempt to limit number of occupants to a figure commensurate with available exits; there are, however, limits of occupancy specified in certain special cases for other reasons.

1102. Population for which exit capacity is to be provided shall be determined in accordance with the provisions of the appropriate sections of Chapter II, as follows, gross or net areas being determined in accordance with Section 42.

Where both gross and net area figures are given for the same occupancy class, the gross area figure shall be applied to the building or structure as a whole. A separate calculation shall then be made for those spaces where population is determined on the basis of net area and if the total population determined on the net area basis exceeds that on the gross area basis, the exit facilities shall be based on the larger population figure.

Occupancy	*Sq. Ft. Per Person*
Places of assembly	15 gross
Theatre and auditorium seating	6 net
Standing space	3 net
Store, street floor and sales basement	30 gross
Other floors	60 gross
School, courtroom and other similar public occupancy	40 gross
Office, factory and workroom	100 gross
Hotel and apartment	125 gross

Occupancy	*Sq. Ft. Per Person*
Institutional	150 gross
Nursing homes, adult sleeping rooms	75 net
Children's sleeping rooms	50 net
Infants' sleeping rooms	25 net
Warehouse, storage and garage . . .	300 gross

These figures, based on counts of typical buildings, represent the average maximum density of occupancy.

1103. The maximum number of persons in a standing position to occupy floor areas such as stairway landings or areas of temporary refuge shall be computed at 3 sq. ft. per person.

SECTION 12. HAZARD OF OCCUPANCY

1201. The hazard of occupancy, for the purpose of this Code, shall be the relative danger of the start and spread of fire, the danger of smoke or gases generated, the danger of explosion or other occurrence potentially endangering the lives and safety of the occupants of the building or structure.

1202. Hazard of occupancy shall be determined by the enforcing authority on the basis of the character of the contents and the processes or operations conducted in the building or structure, provided, however, that where the combustibility of the building, the flame spread rating of the interior finish or other features of the building or structure are such as to involve a hazard greater than the hazard of occupancy, the greater degree of hazard shall govern.

Under this provision any violation of the interior finish requirements of Section 44 would automatically also involve violation of other sections of the Code unless additional exit facilities appropriate for high hazard occupancy were provided.

1203. Where different degrees of hazard of occupancy exist in different parts of a building or structure the most hazardous shall govern the classification for the purpose of this Code, except in as far as hazardous areas are segregated or protected as specified in Section 49 and the applicable sections of Chapter III.

Under this provision any violation of the requirements of Chapter III for segregation or protection of hazardous operation or storage would automatically also involve violation of the other sections of the Code unless additional exit facilities appropriate to high hazard occupancy were provided.

Classification of Hazard of Occupancy

1210. The hazard of occupancy of any building or structure shall be classified as ordinary, high or low in accordance with pars. 1211, 1212 and 1213.

1211. ORDINARY HAZARD occupancies shall be classified as those having contents which are liable to burn with moderate rapidity and to give off a considerable volume of smoke, but from which neither poisonous fumes nor explosions are to be feared in case of fire.

This classification represents the conditions found in most buildings, and is the basis for the general requirements of this Code.

The fear of poisonous fumes or explosions is necessarily a relative matter, to be determined on a judgment basis. All smoke contains some toxic fire gases, but under conditions of ordinary hazard there should be no undue danger of dangerous exposure during the period necessary to escape from the fire area, assuming proper exits.

1212. HIGH HAZARD occupancies shall be classified as those having contents which are liable to burn with extreme rapidity or from which poisonous fumes or explosions are to be feared in the event of fire.

High hazard occupancy may include occupancies where gasoline and other flammable liquids are handled, used or are stored under such conditions as to involve possible release of flammable vapors; where grain dust, wood flour or plastic dusts, aluminum or magnesium dust or other explosive dusts may be produced; where hazardous chemicals or explosives are manufactured, stored or handled; where cotton or other combustible fibres are processed or handled under conditions such as to produce flammable flyings, and other situations of similar hazard.

Section 27, Industrial Occupancies, and Section 28, Storage, include detailed provision on high hazard occupancy.

1213. LOW HAZARD occupancies shall be classified as those having contents of such low combustibility that no self propagating fire therein can occur and that consequently the only probable danger requiring the use of emergency exits will be from panic, fumes or smoke, or fire from some external source.

Section 26, Office Buildings, classes as low hazard any fire-resistive building, with Class A interior finish, with no combustible contents other than papers in metal desks or filing cases. Section 28, Storage, also recognizes as low hazard storage of noncombustible materials. In other occupancies it is assumed that even where the actual contents hazard may normally be low, there is sufficient likelihood that some combustible material or hazardous operation will be introduced in connection with building repair or maintenance, or that some psychological factor might create conditions conducive to panic, so that the exit facilities cannot safely be reduced below those specified for ordinary hazard occupancy.

Special Provisions for High Hazard Occupancies

1221. In all cases where the occupancy is classified as high hazard, exits shall be provided of such types and numbers and so arranged as to permit all occupants to escape from the building or structure, or from the hazardous area thereof, to the outside or to a place of safety with a travel distance of not over 75 ft., measured as specified in pars. 3021 and 3022.

Seventy-five feet can be traversed in approximately ten to fifteen seconds, even allowing for some momentary delay in decision as to which way to go, during which it may be assumed that a normal individual can hold his breath.

1222. Capacity of exits provided in accordance with par. 1221 shall be as specified in the applicable section of Chapter II, but not less than such as to provide 1 unit for each 30 persons where exit is by inside, outside, or fire escape stairs, or 1 unit for each 50 persons where exit is by doors at grade level, by horizontal exits, by Class A ramps or by slide escapes.

Chapter II
EXIT REQUIREMENTS BY OCCUPANCY

SECTION 20. OCCUPANCY CLASSIFICATION

2000. All buildings and structures shall be classified as follows, subject to the ruling of the enforcing authority in case of question as to the proper classification of any individual building or structure.

2001. Assembly (for exit requirements see Section 21)

Places for the congregation or gathering of groups of persons for amusement, recreation, social, religious, patriotic, civic, travel and similar purposes, including occupancies such as:

theatres
motion picture theatres
assembly halls
auditoriums
exhibition halls
museums
skating rinks
gymnasiums
bowling alleys
pool rooms
armories
restaurants
churches
dance halls
club rooms
passenger stations and terminals of air, surface, underground and marine public transportation facilities
recreation piers

Such occupancies are characterized by the presence or potential presence of crowds, with attendant panic hazard in case of fire or other emergency. They are generally open to the public, or may on occasions be open to the public, and the occupants present voluntarily, are not ordinarily subject to discipline or control. Such buildings are ordinarily occupied by able-bodied persons, and are not used for sleeping purposes.

Places of assembly are subdivided by par. 2101 into three groups, according to their capacity: Class A, over 1,000; Class B, 200 to 1,000; Class C, under 200.

Occupancy of any room or space for assembly purposes by less than 100 persons in a building of other occupancy and incidental to such other occupancy shall be classed as part of the other occupancy and subject to the provisions applicable thereto.

Examples: A lunch room with capacity of less than 100 persons (1,500 sq. ft. gross area) in a store; a meeting room with capacity of less than 100 persons (600 sq. ft. net area) in an office building. However, a series of private dining rooms along a common corridor in a hotel, even if each room individually had capacity of less than 100, would constitute an assembly area subject to the exit requirements of Section 21.

2002. Educational (for exit requirements see Section 22)

Educational buildings are those used for the gathering of groups of persons for purposes of instruction such as schools, colleges, universities, academies.

Educational occupancy is distinguished from assembly in that the same occupants are regularly present, they are subject to discipline and control, and in the case of children attendance is compulsory.

Other occupancies associated with educational institutions shall be in accordance with the appropriate other parts of the Code.

In cases where instruction is incidental to some other occupancy, as, for example, instruction to new employees in a store or factory, the section of this Code governing such other occupancy shall apply.

2003. Institutional (for exit requirements see Section 23)

Institutional buildings are those used for purposes such as medical or other treatment or care of persons suffering from physical or mental illness, disease or infirmity, for the care of infants, convalescents or aged persons, and for penal or corrective purposes. Institutional buildings ordinarily provide sleeping facilities for the occupants.

Institutional buildings are treated separately in the following groups:

(*a*) Hospitals and Sanitariums

(*b*) Custodial Institutions
Including nurseries, homes for the aged, convalescent homes

(*c*) Penal Institutions
Including jails, prisons, houses of correction, reformatories

2004. Residential (for exit requirements see Section 24)

A residential building is one in which sleeping accommodations are provided for normal residential purposes, and includes all buildings designed to provide sleeping accommodations except those classified under Institutional.

Residential buildings are treated separately in the following groups, which are defined in par. 2400.

A. Hotels

B. Apartments

C. Dormitories

D. Lodging or rooming houses

E. One- and two-family private dwellings

2005. Mercantile (for exit requirements see Section 25)

Mercantile occupancies include stores, markets and other rooms, buildings, or structures for the display and sale of merchandise.

Office, storage and service facilities incidental to the sale of merchandise and located in the same building are included with mercantile occupancy.

Minor merchandising operations in buildings predominantly of other occupancies, such as a news stand in an office building, shall be subject to the exit requirements of the predominant occupancy.

2006. Office (for exit requirements see Section 26)

Office buildings are those used for the transaction of business (other than that covered under Mercantile), for the keeping of accounts and records and similar purposes. Doctors' and dentists' offices are included unless of such character as to be classified as hospitals. Service facilities usual to city office buildings such as news stands, lunch counters serving less than 100 persons, barber shops and beauty parlors are included in this occupancy group.

City halls, town halls, court houses and libraries are included in this occupancy group in so far as their principal function is the transaction of public business and the keeping of books and records; in so far as used for assembly purposes they are classed as places of assembly.

Minor office occupancy incidental to operations in another occupancy shall be considered as a part of the predominating occupancy and shall be subject to the provisions of this Code applying to the predominating occupancy.

2007. Industrial (for exit requirements see Section 27)

Industrial occupancies include factories making products of all kinds and properties devoted to operations such as processing, assembling, mixing, packaging, finishing or decorating, repairing, and similar operations, including, among others, the following:

Factories of all kinds
Laboratories
Dry Cleaning Plants
Power Plants
Pumping Stations
Smoke Houses
Laundries
Creameries
Gas Plants
Refineries
Sawmills

Section 27 divides industrial occupancies into four sub-groups depending upon the character of the operations.

2008. Storage (for exit requirements see Section 28)

Storage includes all buildings or structures utilized primarily for the storage or sheltering of goods, merchandise, products, vehicles, or animals, such as warehouses, cold storage, freight depots, transit sheds, truck and marine terminals, bulk oil storage, garages, hangars, grain elevators, barns, stables, including servicing, processing or repair operations incidental to storage as in grain elevators, garages and hangars.

Storage properties are characterized by the presence of relatively small numbers of persons in proportion to the area; any new use which increases the number of occupants to a figure comparable with other classes of occupancy changes the classification of the building to that of the new use.

Examples: Hangars used for assembly purposes, warehouses used for office purposes, garage buildings used for manufacturing.

Minor storage incidental to other occupancy shall be treated as part of the other occupancy.

Examples: A stock room in a store; a linen closet in a hotel; a property room in a theatre; incidental storage of raw materials or finished goods in a factory unless in a separate building or fire section devoted exclusively to storage.

2009. Miscellaneous

This occupancy class includes any building or structure which cannot be properly classified in any of the preceding occupancy groups either by reason of some function not encompassed or some unusual combination of functions necessary to the purpose of the building or structure. Such miscellaneous buildings and structures shall conform to the fundamental principles stated in Chapter I of this Code, and to any specific provisions applicable thereto in Section 29 and in Chapters III, IV and V.

2010. Mixed Occupancies

In case two or more classes of occupancy occur in the same building or structure so intermingled that separate exit facilities and safeguards are impracticable, the exit facilities shall be sufficient to meet exit requirements for each individual room or section, and for the maximum population of the entire building determined in accordance with Section 11. Construction, protection and other safeguards shall meet requirements of the most hazardous occupancy unless otherwise specified in Chapter II.

Chapter II contains certain specific provisions on combined occupancies, such as buildings with combined mercantile and residential occupancy

SECTION 21. PLACES OF ASSEMBLY

Classification of Places of Assembly

2100. Places of assembly shall include all buildings and structures described in paragraph 2001.

2101. Places of assembly shall be classified according to their capacity, as follows: Class A, capacity 1,000 persons or more; Class B, capacity 200 to 1,000 persons; Class C, capacity under 200.

2102. Capacity shall be the maximum designed capacity as determined by the enforcing authority but not less than one person for each 15 sq. ft. of the aggregate gross area of all floors of the building or section of the building used for assembly purposes including all lobbies, corridors, dressing rooms, toilet rooms, kitchens and service areas in conjunction with the assembly occupancy, but excluding unoccupied basements or attics.

Parts of an assembly building which are not actually subject to assembly occupancy may appropriately be excluded from the floor area for purposes of determining population, subject to the approval of the enforcing authority. Areas not subject to assembly occupancy may include such areas as the water surface of swimming pool buildings, the alley surfaces of bowling alleys, baggage and freight storage in passenger stations.

2103. Capacity of individual rooms, which are used or usable for theatre type seating, shall be determined separately on the basis of one person for each 6 sq. ft. of net floor area of the individual room. If the aggregate capacity of individual rooms thus determined exceeds that of the building as a whole determined in accordance with paragraph 2102, the larger figure shall govern in determining exit requirements for the building as a whole.

2104. Capacity of standing areas, such as rapid transit station platforms and waiting space in motion picture theatres shall be determined on the basis of one person per 3 sq. ft. of net floor area.

2105. Every place of assembly shall have exits adequate for its capacity as determined above, except that in existing places of assembly the enforcing authority may permit occupancy by number of persons not to exceed that for which the existing exits are adequate, provided that measures are established satisfactory to the enforcing authority to prevent occupancy by any greater number of persons.

Exit Features

Number and Location of Exits

2111. Every place of assembly, every tier or balcony, and every individual room used as a place of assembly shall have exits sufficient to provide for the total capacity thereof as determined in accordance with pars. 2102–04 as follows, no individual unit of exit width in any case to serve more than a total of 100 persons.

(*a*) Doors leading outside the building at grade level, or not more than 21 in. above or below grade, or Class A ramps or horizontal exits, 100 persons per exit unit.

(*b*) Stairs, fire escapes or other type of exit not specified in (a) above, 75 persons per exit unit.

The difference between doors at grade and stairs is based on their rated capacity, 60 persons per minute per unit for level exit through doors, 45 down stairs. These figures provide for an evacuation time of 1 minute 40 seconds assuming rated capacity and travel rate, exclusive of time for first person to reach exit, and exclusive of time for last person to reach a place of safety after entering exit.

The provisions of the above paragraph are based on the assumption that all the occupants of a place of assembly may start for the exits at the same moment, and is different from the situation in buildings of other occupancies where it is assumed that only the occupants of a single floor will rush to the exits at the immediate outbreak of fire and that occupants of other floors can use the same stairways afterwards.

2112a. Every Class A place of assembly shall have at least four separate exits as remote from each other as practicable.

b. Every Class B place of assembly shall have at least two separate exits as remote from each other as practicable, and if of capacity of over 600, at least three, each exit not less than 2 units.

Under the provisions of Section 30 two or more doorways leading into a common foyer, lobby or corridor are not considered separate exits.

c. Every Class C place of assembly shall have at least two means of exit, consisting of separate exits or doors leading to a corridor or other spaces giving access to two separate and independent exits in different directions, except that for places of assembly having a capacity of less than 100 persons or for rooms having a capacity of less than 100 persons, one 2-unit doorway may be permitted in rooms where no part of the room is more than 50 ft. from the doorway measured along the line of travel, and the doorway leads directly outside the building at grade level or leads to a corridor or other space giving access to two separate and independent exits.

2113. Not more than two-thirds of the required exit width from any Class A or Class B place of assembly, or from any floor or balcony thereof, shall lead through a single public lobby.

2114. Exits shall be so arranged that the total length of travel from any point to reach an exit will not exceed 150 ft. in any place of assembly with its principal floor not more than 21 in. above or below grade at the point of principal entrance, or in places of public assembly of any height protected by automatic sprinklers in accordance with Section 46; 100 ft. elsewhere.

Types of Exits

2116. Exits of the specified number and width shall be of one or more of the following types, in accordance with the provisions of Chapter III of this Code:

Doors of the swinging type leading directly outside or through a lobby or passageway leading to the outside of the building.

Horizontal exits.

Smokeproof towers.

Stairs, Class A for all new Class A places of assembly (over 1,000) Class B for medium and small places of assembly and all existing places of assembly.

Outside stairs. Same requirements as for stairs, including intermediate handrails on monumental stairs serving main entrance doors.

Ramps, Class A for all new Class A places of assembly (over 1,000), Class B for medium, small and existing places of assembly.

Fire escapes, Class A, for existing Class A places of assembly (over 1,000), Class B for existing Class B or Class C places of assembly.

Escalators.

Elevators, slide escapes and revolving doors are not recognized as constituting required exits in places of assembly.

Lighting and Signs

2118. All places of assembly shall have exit lighting in accordance with Section 52 and signs in accordance with Section 53. All Class A places of assembly (1,000 or more) shall be provided with Type 1 emergency exit illumination; Class B places of assembly, Type 2 or Type 3 emergency exit illumination, provided that churches of Class B or Class C, used exclusively for religious purposes, shall not be required to have emergency lighting.

2119. No open flame lighting devices shall be used in any place of assembly except:

(*a*) Where necessary for ceremonial purposes the enforcing authority may permit open flame lighting under such restrictions as are necessary to avoid danger of ignition of combustible materials or injury to occupants.

Securely supported altar candles in churches, well separated from any combustible material, may well be permitted. On the other hand, lighted candles carried by children wearing cotton robes present a hazard too great to be permitted even for the most worthy cause. There are many other situations of intermediate hazard where the enforcing authority will have to exercise judgment.

(*b*) Candles may be used on restaurant tables if securely supported on noncombustible bases and so located as to avoid danger of ignition of combustible materials.

(*c*) Open flame devices may be used on stages where a necessary part of theatrical performances, provided adequate precautions, satisfactory to the enforcing authority, are taken to prevent ignition of any combustible materials.

(*d*) Gas or hydrocarbon vapor exit lights may be permitted in accordance with Section 52, Exit Lighting.

Location of Places of Assembly

2121. (*a*) In a fire-resistive building, Class A place of assembly shall be so located that its principal floor will not be more than 80 ft. above grade, nor more than 20 ft. below grade, measured at the point of principal entrance to the building; in a non-fire-resistive building not more than 40 ft. above or 12 ft. below, provided, however, that for existing buildings equipped with automatic sprinklers in accordance with Section 46, these distance requirements may be waived by the enforcing authority.

(*b*) In a fire-resistive building no new Class B place of assembly shall be located with its principal floor more than 20 ft. below grade. In a non-fire-resistive building no new Class B place of assembly shall be located with its main floor more than 28 ft. above grade, nor with any part of its floor more than 40 ft. above grade, nor more than 12 ft. below grade. Grade shall be measured at the point of principal entrance to the building. In existing buildings provided with automatic sprinklers in accordance with Section 46, these limits may be modified at the discretion of the enforcing authority.

(*c*) Where the principal entrance to a place of assembly is via a terrace with an area at least 10 per cent of the ground area of the building, the level of the terrace shall be considered grade level for the purpose of pars. (a) and (b) above.

Protection of Exits and Vertical Openings

2123. All interior stairways and other vertical openings shall be enclosed and protected as provided in Section 43 except that stairs may be open between balconies and main assembly floor in theatres, churches or auditoriums.

All stairways and other vertical openings should be enclosed for safety but in the case of theatre balconies, open to the main floor below, no additional safety is provided by enclosure of stairways.

Interior Finish and Decorations

2124. The decorations of places of assembly shall be of fire-resistive or nonflammable materials. Fabrics and papers used for such purpose shall be treated with an effective flameproofing material. Stage settings made of combustible materials shall likewise be treated with flameproofing materials. Flameproofing treatments shall be as specified in Section 54.

Paper and cloth decorative materials should be kept to a minimum in places of public assembly.

The increased hazard of the kindling and spread of fire in places of public assembly due to the presence of decorative materials such as paper, cloth and foliage may be mitigated but not necessarily eliminated by flameproofing treatment.

2125a. The interior finish requirements of this section shall be in accordance with Section 44 of this Code and subject to modifications specified therein.

b. Interior finish in all exitways in Class A and Class B places of assembly shall be Class A. Interior finish in all exitways in Class C places of assembly shall be Class A or Class B.

c. Interior finish in general assembly areas shall be as follows:

In Class A and Class B places of assembly:
Class A or Class B interior finish.

In all Class C places of assembly, and in individual rooms of less than 200 capacity in any place of assembly: Class C.

Seating, Aisles, Railings, Turnstiles

2131. Seats in places of public assembly accommodating more than 200 persons shall be securely fastened to the floor except as permitted by par. 2132. All seats in balconies and galleries shall be securely fastened to the floor, except that in railed-in enclosures, boxes or loges with level floors and having not more than 14 seats they need not be fastened.

2132. Chairs not secured to the floor may be permitted in restaurants, night clubs and other occupancies where the fastening of seats to the floor may be impracticable, provided that in the area used for seating (excluding dance floor, stage, etc.) there shall be not more than one seat for each 15 sq. ft. of floor area and adequate aisles to reach exits shall be maintained at all times.

If at any time the enforcing authority finds that the above conditions are not maintained, it will be appropriate to require that chairs be fastened to the floor even though this may interfere with the normal operation of the establishment.

2133. (*a*) Rows of seats between aisles shall have not more than 14 seats.

(*b*) Rows of seats opening on to an aisle at one end only shall have not more than 7 seats.

(*c*) Seats without dividing arms shall have their capacity determined by allowing 18 in. per person.

2134. The spacing of rows of seats from back to back shall be not less than 30 in., nor less than 27 in. plus the sum of the thickness of the back and inclination of the back. There shall be a space of not less than 12 in. between the back of one seat and the front of the seat immediately behind it as measured between plumb lines.

2135. Aisles shall be not less than 3 ft. wide except that when not to exceed 60 seats are to be served by an aisle its width may be not less than 30 in. Steps shall not be placed in aisles to overcome differences in level unless the gradient exceeds one ft. rise in 10 ft. of run. In new buildings steps in aisles shall conform to the requirements for Class A stairs as to rise and tread except that in galleries the rise and tread may conform with Class B; in existing buildings Class B and Class C respectively. The gradient of sloping aisles shall not exceed one ft. rise in 10 ft. of run.

2136. The line of travel to an exit door by any aisle shall be not greater than 150 ft. Not more than 20 transverse rows of seats shall be placed between cross aisles. Not more than 10 rows of seats nor 12 ft. of rise shall be placed between cross aisles where steps are provided in the main aisles to overcome differences in level. Cross aisles shall be not less than 44 in. wide, unless railed away from the seats fronting thereon. If so railed the width shall not be less than three ft.

2137. The fasciae of boxes, balconies and galleries shall have substantial railings not less than 26 in. high above the floor. The railings at the ends of aisles extending to the fascia shall be not

less than 30 in. high for the width of the aisle, or 36 in. high if at foot of steps.

2138. Cross aisles, except where the backs of seats on the front of the aisle project 24 in. or more above the floor of the aisle, shall be provided with railings not less than 26 in. high.

2139. No turnstiles or other devices to restrict the movement of persons shall be installed in any place of assembly in such a manner as to interfere in any way with required exit facilities.

See par. 3261 for further information on turnstiles.

Service Equipment and Storage Facilities

2141. Rooms containing high pressure boilers, refrigerating machinery of other than domestic refrigerator type, large transformers or other service equipment subject to possible explosion shall not be located directly under or adjacent to required exits. All such rooms shall be effectively cut off from other parts of the building, and shall be provided with adequate vents to the outer air, in accordance with Section 49 of this Code.

2142. All air conditioning, heating and cooking installations shall comply with Section 47 of this Code.

2143. All rooms or areas used for storage of any combustible materials or equipment, or for painting, refinishing, repair or similar purposes shall be effectively cut off from assembly areas or protected with a standard system of automatic sprinklers.

In many existing buildings of combustible construction enforcement of these requirements may involve difficult problems, which may be dealt with individually by the enforcing authority under the broad powers vested in him by paragraph 1010 of this Code.

Alarms and Drills

2145. A manually operated fire alarm system, coded to alert employees or attendants and otherwise conforming to the requirements of Section 45 shall be installed for every place of public assembly having a capacity of 1,000 or more persons. Theatres equipped with movable scenery shall have alarm sending stations on both sides of the proscenium wall in locations designated or approved by the enforcing authority.

Many authorities believe that the use of alarm sounding devices (gongs, sirens, etc.), in places of public assembly in buildings, such as theatres, in which fire exit drills are not feasible, may create panic conditions, and recommend visual signals, coded lights or other devices for alerting personnel responsible for an orderly evacuation of the building in the event of an emergency.

2146. The employees or attendants of places of public assembly shall be schooled or drilled in the duties they are to perform in case of fire, panic or other emergency in order to be of greatest service in effecting orderly exit of assemblages. Such drill shall conform in so far as practicable to Section 51.

Attention is directed to the importance of having an adequate number of competent attendants at all times when the place of public assembly is occupied.

Waiting Space

2151. In theatres and similar places of public assembly where persons are admitted to the building at times when seats are not available for them and are allowed to wait in a lobby or similar space until seats are available, such use of lobby or similar space shall not encroach upon the required clear width of exits. Such waiting shall be restricted to areas separated from the required exit ways by substantial permanent partitions or fixed rigid railings not less than 42 in. high. Exits shall be provided for such waiting spaces on the basis of one person for each three sq. ft. of waiting space area. Such exits shall be in addition to the exits specified for the main auditorium area and shall conform in construction and arrangement to the general rules for exits given in this section.

Stage

2152. Every stage equipped with fly galleries, gridirons and rigging for movable theatre type scenery, shall have a system of automatic sprinklers over and under such stage areas or spaces and in auxiliary spaces such as dressing rooms, storerooms and workshops, and the proscenium opening shall be provided with a fire-resisting curtain, capable of withstanding a lateral pressure of 10 lbs. per sq. ft. over the entire area. The curtain shall have an emergency closing device capable of causing the curtain to close without the use of applied power and when so closed it shall be reasonably tight against the passage of smoke.

2153. The stage roof of every theatre using movable scenery or having a motion picture screen of highly combustible construction shall have a ventilator or ventilators in or above it, operable from the stage floor by hand and also opening by fusible links or other approved automatic heat actuated device, to give a free opening equal to at least $\frac{1}{8}$ the area of the floor of the stage.

2154. Where automatic sprinkler protection is not provided the proscenium wall of every theatre using movable scenery or decorations shall have, exclusive of the proscenium opening, not more than two openings entering the stage, each not to exceed 21 sq. ft. and fitted with self-closing fire doors.

Projection Booth

2155. Every place of assembly in which projections of motion pictures by light are made shall have the projection apparatus enclosed in a standard fire-resistive fixed booth, except that such booth shall not be required where no nitrocellulose motion picture film is used.

Standard booth construction is described in NFPA Standard No. 40, Cellulose Nitrate Motion Picture Film.

The National Electrical Code contains similar requirements for booths, as well as electrical provisions.

Auditorium Vents

2156. Automatic smoke vents shall be installed above the auditorium of theatres, including motion picture theatres, with vent area equal to not less than one thirtieth (3⅓%) of the floor area of the auditorium, including the sum of the floor areas of all balconies, galleries, boxes and tiers.

See pars. 4721 *et seq.* for further information on smoke venting.

2157. All preceding general requirements of this section shall apply to theatres.

SPECIAL PROVISIONS FOR EXHIBITION HALLS

2161. No display or exhibit shall be so installed or operated as to interfere in any way with access to any required exit, or with visibility of any required exit, or of any required exit sign.

2162. All displays or exhibits of combustible material or construction, and all booths, temporary construction in connection therewith shall be so limited in combustibility or protected as to avoid any undue hazard of fire which might endanger occupants before they have opportunity to use available exits, as determined by the enforcing authority.

Exhibits employing gasoline or other flammable liquids or compressed combustible gases, depending upon their character, may involve a hazard such as to justify prohibition of this class of exhibits. The hazard of booth construction of light lattice work, paper or other highly combustible materials may be mitigated by flameproofing treatment.

2163. All other general requirements for places of assembly shall be complied with.

SPECIAL PROVISIONS FOR PASSENGER STATIONS

2171. All passenger loading platforms of passenger stations or terminals which are enclosed or fenced shall be provided with means of egress sufficient to provide one unit of exit width for each 100 persons capacity of platform area (3 sq. ft. per person as per par. 2104) not counting the loading side of the platform as a means of egress if elevated more than one foot above the track or roadway grade.

2172. All the general requirements for places of assembly shall be complied with.

SPECIAL PROVISIONS FOR PLACES OF ASSEMBLY IN BUILDINGS OF OTHER OCCUPANCY

2181. Places of assembly in buildings of other occupancy, such as ballrooms in hotels, restaurants in stores, assembly rooms in schools shall be so located, separated or protected as to avoid any undue danger to the occupants of the place of assembly from a fire originating in the other occupancy, or smoke therefrom.

Depending upon the character of construction and the hazard of the occupancy, this will require some physical separation by walls of appropriate fire resistance, protection of the other occupancy by automatic sprinklers, or other appropriate measures. Where the building is of fire-resistive construction, and the hazard of the other occupancy is low or moderate as in a school or hotel, no separation may be necessary.

2182. Places of assembly in buildings of other occupancy may use exits common to the place of assembly and the other occupancy provided that the assembly area and the other occupancy considered separately each have exits sufficient to meet the requirements of this Code.

2183. Exits shall be sufficient for simultaneous occupancy of both the place of assembly and other parts of the building, unless the enforcing authority determines that the conditions are such that simultaneous occupancy will not occur, such as in certain schools as per par. 2251.

Example: An assembly room for the inmates of an institution will not be subject to simultaneous occupancy.

2184. For any Class A place of assembly (1,000 or more persons) at least half the required means of exit shall lead directly outdoors or through exit ways completely separated from exits serving other parts of the building.

2185. All general requirements for places of assembly shall be complied with where the assembly occupancy is 100 or more persons.

SPECIAL REQUIREMENTS FOR PLACES OF OUTDOOR ASSEMBLY

2191. All grandstands, tents and other places of outdoor assembly shall comply with the requirements of NFPA Standard No. 102, Places of Outdoor Assembly, Grandstands and Tents, and when in complete compliance therewith are exempted from all provisions of the Building Exits Code except Chapter I which shall apply.

SECTION 22. EDUCATIONAL OCCUPANCIES (Schools, Colleges, etc.)

2201. Educational buildings shall include all buildings and structures described in paragraph 2002.

2202. The capacity of educational buildings or any individual story or section thereof shall be the maximum designed capacity as determined by the enforcing authority but not less than one person for each 40 sq. ft. of gross floor area within the perimeter of the building, with no deduction for corridors, closets, thickness of walls or other deductions except for spaces such as attics not subject to occupancy.

The figure of 40 sq. ft. per person is based on a net area used for classrooms of half the gross floor area, with an occupancy of one person per 20 sq. ft. of net area used for educational purposes. This provides for average population of most crowded schools as shown by counts of typical schools, and is in substantial agreement with various state laws governing school construction.

2203. Capacity of individual lecture rooms, gymnasiums or cafeterias used for assembly purposes, shall be determined by the enforcing authority on the basis of the maximum occupancy, computed at one person for six sq. ft. of area available for seating.

Number and Location of Exits

2211. Every educational building, and every floor, section or room thereof considered separately, shall have exits sufficient to provide for the capacity thereof as determined in accordance with pars. 2202 and 2203, comprised of one or more types of exits, as follows:

Doors, in accordance with Section 32, leading directly outside building at grade level, or not to exceed 21 in. above or below grade, . . . 100 persons per unit of exit width

Doors leading outside building but requiring steps of over 21 in. total height to reach grade
. . . 100 persons per unit door width; steps must have ⅓ more units of width than doors to allow for slower travel rate

Stairs or Smoke-proof towers, in accordance with Section 33
. . . 60 persons per unit of exit width

Ramps, in accordance with Section 34
Class A . . . 100 persons per unit of exit width
Class B, C . . . 60 persons per unit of exit width

Horizontal Exits, in accordance with Section 39
. . . . . 100 persons per unit of exit width

Fire Escape Stairs, Class A or B, in accordance with Section 35, for existing buildings only . . . 60 persons per unit of exit width

Slide Escapes, in accordance with Section 36, for existing buildings only . . . 80 persons per chute

This provides for emptying street floors, not over 21 in. above grade, in 1 min. 40 sec., assuming use of exits at their rated capacity in numbers of persons per minute (60 for level travel, 45 down stairs), not counting the time for the first person to reach the exit, nor for the last person to traverse the exit and reach a place of safety. For upper floors the time is 1 min. 20 sec.; the difference in time allows for the potentially greater hazard on upper floors and the fact that there may be some delay where the occupants of two or more floors use the same stairway.

2212. The same exit units or fraction thereof required by par. 2211 for any individual floor shall not be counted as serving any other floor, except where enclosed interior stairways, enclosed ramps, outside fire escape stairs or slide escapes serve multi-story buildings, the same exit units may be counted as simultaneously serving all floors above the first story or street floor.

For example, in the case of enclosed interior stairways, where the capacity of the third floor is such as to require three stairways, and the capacity of the second floor also requires three stairways, the second floor may utilize the stairways also serving the third floor, so that the total number of stairways required is three, not six. However, the street floor and basement must have their required exit capacity provided by separate exits, or if the path of exit from the street floor or basement is through a part of the same stair tower serving the upper floors, the total exit capacity must be such as to provide required exit facilities for street floor and basement without encroaching upon the stair capacity required for upper floors. This assumes that because of greater travel distance the occupants of floors above the second will require a longer time to reach the street and will not make simultaneous exit.

2213. Exits, in accordance with paragraphs 2211 and 2212, shall be so arranged that at least two separate exits will be available in every floor area. Exits shall be as remote from each other as practicable, so arranged that there will be no pockets or dead ends of appreciable size in which occupants may be trapped, and in no case shall any dead end corridor extend more than 40 ft. beyond the stairway or other means of exit therefrom.

A school plan with outside doors or stairways at both ends of a central corridor meets this requirement. Pockets may be created where stairways are not at the end of corridors but at intermediate points. This problem is avoided altogether in one story buildings having doors leading directly outside from each classroom. In the case of existing buildings the hazard of dead-end corridors may be mitigated by installing exterior fire escapes.

2214. Exits shall be so located that at least one stairway or other exit will be within 100 feet (measured along the line of travel as

per par. 3021) of the corridor exit door of every room; provided that in buildings completely protected by an automatic sprinkler system this distance may be 150 feet.

2215. Every room with a capacity of over 100 persons or over 2000 sq. ft. in area shall have at least two doorways as remote from each other as practicable. Such doorways shall provide access to separate exits, but may open upon a common corridor leading to separate exits in opposite directions.

2216. Aisles, corridors and other means of access to exits, and discharge from exits, shall be in accordance with Section 31. Corridors shall be not less than six feet wide in the clear. Room doors or locker doors swinging into corridors shall not at any point in their swing reduce the clear effective width of the corridor to less than six feet, nor shall drinking fountains or other equipment, fixed or movable, be so placed as to obstruct the required minimum six-foot width.

It is not considered good practice to locate lockers in corridors of elementary schools.

2217. All required stairways shall be located adjoining outside walls and shall lead directly outdoors, or through a vestibule where needed for protection against cold or storm, provided that such vestibule shall not in any way curtail the exit.

2218. EXAMPLE. Assume a three story and basement building. Assume that there is an auditorium (no basement) in a wing 50 x 60 feet on the first floor; first floor area (including auditorium) 10,500 square feet, other floors 7500 square feet per floor. Assume that there are no independent exits from basement and that the occupants of the basement must use first floor exit doors.

Population of second story will be $7500 \div 40 = 187$

Exit stairs required

$187 \div 60 = 3.1$ units, which means 2, 2-unit stairways.

The third floor will have similar exit requirements; the same 2-unit stairway will also serve the third floor.

Stairs from basement, similarly figured, will also be 2, 2-unit stairways.

Street floor doors for classroom section

$187 \div 100 = 1.9$ units, but requirement for 2 ways out requires 2, 2-unit exits.

Street floor doors for auditorium

Population, 3000 sq. ft., at 6 sq. ft. per person = 500

$600 \div 100 = 5$ units.

Total street floor doors:

	Assuming separate use	*Assuming most efficient combined use*
(*a*) To serve stairs from upper floors	4 units	3.1 units
(*b*) To serve stairs from basement	4 units	3.1 units
(*c*) To serve street floor	4 units	1.9 units
(*d*) To serve auditorium	5 units	5 units
Total	17 units	13.1 units

This street floor door requirement, assuming separate use, may be satisfied by providing 8, 40-inch doors and one single unit door or other equivalent arrangement. The doors (*a*) and (*b*) should be located at the stairs, the doors (*d*) should provide a path of travel to the open air as direct and short as possible.

The doors (*c*) may be at any convenient location, so disposed that the requirement for two ways out of every floor area will be satisfied.

Assuming combined use the situation will be the same except that part of the street floor exit capacity may be provided by the surplus capacity of doors serving stairways. In that case, depending upon plan, 6 40-in. doors and one single unit door may be sufficient, neglecting the fraction as authorized by par. 3013.

PROTECTION OF EXITS AND CONSTRUCTION FEATURES

2221. All interior stairways, shafts and other vertical openings shall be enclosed and protected as specified in Section 43 except that par. 4302 and the Special Provision for Escalator Openings shall not apply.

2222. All doors serving exits, or protecting vertical openings shall comply with Section 32. Doors in stairway enclosures and smoke stop doors shall be kept normally closed, except that such doors may be kept normally open under the conditions specified in par. 3208.

2223. Exterior doors shall be operated by bars or other panic hardware device, in accordance with par. 3221, except that doors leading from classrooms directly to the outside may be equipped with the same knob-operated schoolhouse type lock as is used on classroom doors leading to corridor, with no provision whatsoever for locking against egress from the classroom.

2224. Any corridors 300 or more feet in length shall be divided into sections not to exceed 300 feet in length by smoke barriers, consisting of partitions with double swing smoke stop doors therein. Such smoke barriers shall be of fire-resistive construction in buildings of such a character as to require fire-resistive construction for corridor walls. Doors in smoke barriers shall be of metal, metal covered, or other approved type appropriate to

the purpose and construction of the smoke barrier, with clear wired glass panels.

2231. In order to assure adequate safety through the use of the exits required by the previous paragraphs, all new buildings in which more than two stories are used for educational purposes shall be of fire-resistive construction; two-story buildings shall be of fire-resistive construction if the first floor is more than 8 feet 6 inches above the grade level at any point next to the building. Service and entrance areaways encompassing not more than 10 per cent of the perimeter of the building may be omitted from the determining grade level.

For example, a so-called two-story and basement building must be of fire-resistive construction if the basement, first and second floors are all used for educational purposes, or in any case if the first floor is more than 8 ft. 6 in. above grade.

2232. In buildings of combustible construction the interior finish shall be equivalent to plaster in smoke-tightness. All hollow spaces in wood stud walls or partitions shall be fire stopped at floor lines with noncombustible material.

2233. All basement walls and partitions shall be of fire-resistive or noncombustible construction. In all buildings required by par. 2231 to be of fire-resistive construction, corridor walls shall be fire resistive and all glass in windows or doors between corridors and rooms shall be wired glass.

2234. Floor construction immediately above rooms used for manual training, domestic science, kitchens, laboratories, and shops, shall be of construction having a minimum of one hour fire resistance, and immediately above boiler, heater, or fuel storage or other similar occupancy shall have two hour fire resistance.

2235. Doors to basement rooms of occupancies listed in par. 2114 leading to stairs, corridors or other lines of exit shall be self-closing, of metal or metal covered or of other approved type and windows leading to corridors shall be approved wired glass windows with stationary metal frames.

2236. All central heating plants within school buildings, including fuel storage rooms, shall be completely surrounded by fire-resistive enclosures with self-closing fire doors protecting all openings thereto, except those in exterior walls.

2237. Interior finish shall be Class A or B in corridors, exitways and other spaces not otherwise specified, Class C in individual rooms of not over 100 persons capacity, all as specified in Section 44 of this Code and subject to the modifications therein provided.

Lighting, Signs, Alarms, Drills

2241. All educational buildings shall have adequate exit illuminations in accordance with Section 52. Buildings designed for night occupancy shall have Type 1 or Type 2 emergency exit illumination.

2242. All educational buildings shall have signs designating the locations of exits or the path of travel to reach them, in accordance with Section 53.

Signs are not required in situations where location of exits is otherwise obvious and familiar to all occupants, such as in small elementary school buildings.

2243. Approved manually operated fire alarm facilities in accordance with Section 45 shall be provided in every educational building. Such facilities shall be tested daily during the school term.

2244. Fire exit drills shall be regularly held, conducted in accordance with the applicable provisions of Section 51.

SPECIAL PROVISIONS FOR COMBINED OCCUPANCIES

Assembly and Educational

2251. All auditoriums, assembly rooms, cafeterias, gymnasiums used for assembly purposes such as athletic events, with provisions for seating of spectators, or other spaces subject to assembly occupancy, shall comply with Section 21, including Special Provision for Places of Assembly in Buildings of Other Occupancy, which provides that where auditorium and gymnasium exits lead through corridors or stairways also serving as exits for other parts of the building the exit capacity shall be sufficient to permit simultaneous exit from auditorium and classroom sections, except in case of auditoriums and gymnasiums of types suitable only for use of the school population (and therefore not subject to simultaneous occupancy) in which case the same exit capacity may serve both sections.

Dormitory and Classrooms

2252. Buildings used for both classrooms and dormitory purposes shall comply with the applicable provisions of Section 24 in addition to complying with Section 22. Where classroom and dormitory sections are not subject to simultaneous occupancy the same exit capacity may serve both sections.

Other Combined Occupancies

2253. Any other combinations of occupancy not covered in pars. 2251 and 2252 shall comply with all applicable sections of this Code, with exits adequate to serve all occupancies simultaneously.

2254. Any hazardous occupancy in the same building with an educational occupancy shall be segregated in accordance with Section 49.

SPECIAL PROVISIONS FOR EXISTING BUILDINGS

2261. Where exit facilities in existing buildings are inadequate, additional exits shall be provided to meet the requirements of this Code. Such exits shall be of any of the types specified for new buildings, or may include fire escape stairs in accordance with Section 35 or slide escapes in accordance with Section 36.

2262. Stairways not located adjacent to outside walls, and requiring travel through a corridor to reach the outside of the building may be accepted as required exits if the enforcing authority determines that the arrangement is such as to provide a reasonably safe means of egress in accordance with the principles of this Code.

2263. Existing buildings lacking the enclosure of stairs and protection of other vertical openings specified for new buildings, may be occupied if completely protected by a standard system of automatic sprinklers in accordance with Section 46, and if exits are sufficient in capacity and so arranged that each room or section has at least one exit of sufficient capacity to serve all the occupants of that room or section, such capacity to be separate from that serving any other room or section, and such exit to be so arranged as to be accessible without passing through any corridor subject to possible blocking by smoke rising from a lower level through unprotected vertical openings.

This condition may be met in various ways, such as by providing doors leading directly outside from first floor rooms, and direct access to fire escape balconies from every room on upper floors.

2264. Existing buildings of combustible construction may be occupied to heights exceeding the limits specified for new buildings, if completely protected by a standard system of automatic sprinklers in accordance with Section 46.

SECTION 23. INSTITUTIONAL OCCUPANCIES

2300. Institutional buildings shall include all buildings and structures described in par. 2003. The following paragraphs headed General shall apply to all institutional buildings. The divisions of this section on Hospitals and Sanitariums, Nursing, Convalescent and Old Age Homes and Penal Institutions shall apply to these occupancy groups, subject to the determination of the enforcing authority in case of question as to which part of this section is applicable to any individual building. Rooms used for institutional purposes in buildings of other classes of occupancy shall be governed by the sections of this Code applicable to such other classes of occupancy, if no sleeping accommodations are provided, for example, dentists' and doctors' offices in office buildings or dwellings; or, in the case of provision of sleeping accommodations, if the total capacity is less than the minimum number of occupants to which this section applies; for example, the nursing care of two elderly persons in a private dwelling.

GENERAL

(Applies to all kinds of institutional occupancy)

2301. All institutional buildings shall be so designed, constructed, maintained, and operated as to minimize the possibility of fire requiring the evacuation of occupants, and to provide personnel and procedures adequate to assure effective utilization of exit facilities should the need arise, in recognition of the fact that in this class of occupancy, unlike other classes of occupancy treated in this Code, exits or character of construction alone are not sufficient to provide proper safety for occupants physically or mentally disabled or under restraint; and that safety to life in buildings of this occupancy requires,

(*a*) Proper construction and protection of buildings.

(*b*) Adequate exits.

(*c*) Careful housekeeping and safeguarding of fire hazards

(*d*) A competent, trained staff having adequate personnel on duty at all times.

2302. It is recognized that in institutions or parts of buildings housing various types of psychiatric patients, or used as penal institutions, it is necessary to maintain locked doors and barred windows; and to such extent the necessary provisions in other sections of this Code requiring the keeping of exits unlocked may

be waived. It is also recognized that certain types of psychiatric patients are not capable of seeking safety without adequate guidance. In buildings where this situation prevails, reliable means for the rapid release of occupants shall be provided, such as the remote control of locks, or by keying all locks to keys commonly used by attendants. Frequent inspection and proper maintenance shall be provided to insure the dependability of the method of evacuation selected. Institutions which find it necessary to lock exits shall at all times maintain an adequate staff qualified to release and conduct occupants from the immediate danger area to a place of safety in case of fire or other emergency.

2303. All heating, ventilating, air conditioning, lighting, cooking or other service equipment shall be of safe types, installed, maintained, and operated in accordance with recognized safe practice. Smoking shall be prohibited except under staff supervision, or in locations or under conditions where there is no fire hazard.

Careful housekeeping can be relied upon to reduce the number of fires in good buildings. The most rigid discipline with regard to prohibition of smoking may not be nearly so effective in reducing incipient fires from surreptitious smoking as the open recognition of smoking, with provision of suitable facilities for smoking. Proper education and training of the staff and attendant corps in the ordinary fire hazards and their abatement is unquestionably essential. The problem is a broad one, variable with different types and arrangement of buildings, and the effectiveness of rules of procedure, necessarily flexible, depends in large part upon the management.

2304. No combustible materials of any kind shall be stored or used in any building or section thereof used for institutional occupancy, except as necessary to normal occupancy and use of the building.

2305. All hazardous areas such as boiler rooms, basements or attics used for the storage of combustible material, workrooms such as carpenter shops, paint shops and upholstery shops, central storerooms such as furniture, mattresses and miscellaneous storage, and similar occupancies intended to contain combustible materials which will either be easily ignited, burn with an intense flame or result in the production of dense smoke and fumes shall be so safeguarded as to minimize any hazard to the occupants of the building from fires occurring in such areas. The means of safeguarding shall be appropriate to the degree of hazard as determined by the enforcing authority, and shall consist of separation by fire-resistive construction, automatic extinguishing

facilities, or by both fire-resistive construction and automatic extinguishing facilities where the hazard is severe.

The degree of fire resistance of ceilings, partitions and doors required for cut-offs should be commensurate with the hazard involved. For example, kitchens provided with automatic extinguishing systems to control grease fires do not require cut-offs as do paint shops which contain concentrations of volatile materials in small areas.

The early discovery and extinguishment of fires in hazardous areas is more important to life safety than the confinement of such a fire to the area. It is therefore recommended that hazardous areas should be protected by an approved automatic sprinkler system or automatic fire detection system.

The need for automatic protection of any individual room or space will depend on its size and degree of combustibility of the contents. The location of rooms is also an important factor. Rooms of hazardous occupancy located in the basement may require automatic protection for the safety of the occupants of the building, while similar rooms and hazards located in a roof house in a building of fire-resistive construction might burn out without causing any immediate danger to the occupants of the floors below. The safest plan is to locate hazardous occupancies in separate detached buildings.

Automatic sprinkler and automatic fire detection systems require regular supervision, tests, and maintenance to assure that they will be in proper operative condition in case of fire. The character of the supervision and maintenance available, the type of water supply and public fire department protection in the individual locality, the size and character of the building, and other local factors should be considered in determining the type of automatic protection appropriate for any individual building.

2306. All institutional buildings shall be provided with standard types of fire extinguishers, or standpipe and hose systems, or both so located that suitable first aid extinguishing equipment will be quickly and conveniently available to use on a fire in any part of the building as provided in Section 46. Such equipment shall be maintained in proper operating condition at all times and employees or attendants shall be regularly trained in its use.

In institutional occupancies where occupants may be physically or mentally unable to escape from a fire unaided, or where they may be under restraint, greater emphasis is placed on extinguishing equipment than in ordinary occupancies where the standard recommendation in case of fire is to first evacuate the building and then deal with the fire, and manual fire fighting equipment is thus of secondary importance from the point of view of life-safety.

HOSPITALS AND SANITARIUMS

2310. Safety to life from fire in hospitals and sanitariums requires that the superintendent and staff give attention to and take adequate measures to meet their responsibilities in all details affecting the fire safety of patients, which is often lost sight of where the needs for medical attention and care of patients absorb the attention of those in charge. Those in authority should realize that the protection of the sick and helpless against loss of life by fire or smoke is a responsibility of importance comparable to that of medical attention.

Exit Features

2311. The capacity of hospitals and sanitariums or any individual story thereof shall be the maximum designed occupancy as determined by the enforcing authority, but not less than one person for each 150 sq. ft. of gross floor area within the perimeter of the building, with no deduction for corridors, closets, thickness of walls or other deductions except for spaces such as attics not subject to occupancy.

Hospitals will seldom be found with population greater than one person per 150 sq. ft. gross floor area.

In hospitals of usual design and occupancy, exits provided to satisfy requirements for maximum distance from any point to an exit will be found more than sufficient to provide the capacity here specified.

2312. Exits shall be so placed that the entrance door of every private room and every point in open wards, day rooms, dormitories and dining rooms and other spaces shall be not more than 100 feet (along the line of travel) from the nearest exit; in buildings equipped with automatic sprinklers this distance may be 150 feet. In buildings or sections occupied by bed-ridden patients where the floor area is over 3,000 square feet (20 patients as per par. 2311) such exits shall be doors leading to the ground level at the outside of the building, horizontal exits or enclosed ramps, so arranged as to facilitate moving patients in hospital beds. Exits shall be remote from each other and shall be so arranged with regard to floors that there are no pockets or dead ends more than 30 ft. in length in which occupants may be trapped.

Requirements for exits and smoke barriers (par. 2323) should not be confused. Exit enclosures are designed to protect against the horizontal and vertical passage of fire, smoke and hot gases. Smoke barriers are designed to protect against the horizontal passage of smoke.

Many hospital authorities advise against the placing of an exit at the extreme end of a hospital wing occupied by operating or delivery rooms

for the reason that this arrangement can be a source of contamination from air-borne bacteria but with proper control over the normal use of exit facilities it should be possible to provide exits at any location without introducing danger of contamination. Hospital operating rooms and delivery rooms should be so located that through traffic cannot normally pass them.

The enforcing authority may, under his discretionary power, permit the use of an interior stairway in a wing containing operating rooms or delivery rooms in such a manner that there will be no normal traffic past the doors of operating rooms or delivery rooms located in the area, but which will provide adequate exits for patient bedrooms adjoining such facilities.

2313. Exits shall be of the following type, in accordance with Chapter III, sufficient in number to provide at least one exit unit for each 30 persons capacity in accordance with par. 2311.

(*a*) Horizontal exits.
(*b*) Doors leading directly outside the building (without stairs).
(*c*) Ramps.
(*d*) Stairways.

Not less than two exits of one or more of the above types shall be provided for every floor (including basement) of every building or section. At least one exit in each section shall be of type (a), (b) or (c) to facilitate the rapid removal of patients on beds and stretchers.

See par. 3911 for additional requirements for type (a) exit.

2314. All required exits in new buildings which serve as egress from hospital and infirmary sections shall be not less than 44 inches in clear width, including entrance doors and corridors in connection therewith, to permit the transportation of patients on beds, litters, or mattresses. Additional width shall be provided wherever necessary for change in direction in the movement of beds.

Where beds are to be moved from an individual room or ward into a corridor and then turned at right angles to move along a corridor, ample corridor width is needed. A minimum of 96 inches is suggested, but in existing buildings corridors as narrow as 60 inches wide may be acceptable under some conditions. Ample space is also needed to permit making turns on stair landings where patients may have to be moved on litters or mattresses.

2315. Revolving doors and other types of exits not specifically recognized in this Section shall not be counted as required exits, and shall not be installed except in situations such as revolving doors at a main entrance where not subject to emergency exit use by patients. Elevators in accordance with Section 38 constitute a desirable supplementary facility, but are not counted as required exits.

2316. Basements shall be treated the same as upper stories and exits provided accordingly, except where basements are used only for service and other incidental purposes in which case the enforcing authority shall specify exits appropriate to the actual occupancy in accordance with the principle of this Code.

2317. Auditoriums, chapels, residential, garage, industrial or other occupancies in connection with hospitals shall have exits provided in accordance with the other applicable sections of this Code.

Protection of Exits and Construction Features

2321. All interior stairways, elevator shafts and other vertical openings shall be enclosed and protected as specified in Section 43.

2322. No more than 150 feet of corridor without barrier against the lateral passage of smoke shall be permitted, and the enforcing authority may order fire walls, or smoke barriers, or both, to be built in new or existing buildings where he finds that such fire walls or smoke barriers are necessary to reasonable safety of the occupants of the hospital.

2323. Each story in which 35 or more patients are housed shall be divided into at least two compartments by smoke barriers, and the enforcing authority may require stories housing a lesser number of patients to be divided into compartments when, in his judgment, such division is essential to the protection of the patients.

2324. Doors in smoke barriers shall be so installed that they may normally be kept in open position, but will close automatically or may be released manually to self-closing action, as provided in par. 3208. Corridor door openings in smoke barriers shall be not less than 44 inches in width.

In the planning of hospital exits it is essential that arrangements are made to facilitate the transfer of patients in their beds from one section of a floor housing patients to another section of the same floor separated by a fire wall or smoke barrier. The value of the general principle of horizontal exits (see Section 39) by dividing areas in which patients are housed into at least two compartments separated by a smoke barrier equipped with self-closing doors is thus recognized. Where the building design will permit, it is highly desirable to separate the section of the corridor containing an elevator lobby from corridors leading from it by smoke barriers. Such an arrangement, where elevators are centrally located, will, in effect, produce a smoke lock, placing a double barrier between the area to which patients may be taken and the area from which they may be evacuated because of threatening smoke and fire.

2325. Interior finish shall be Class A in corridors, exit ways, all rooms for mental patients regardless of capacity and other spaces not otherwise specified and Class B in individual rooms of not over 4 persons capacity, all as specified in Section 44 and subject to the modifications therein provided.

2326. Rooms of hazardous occupancy, as defined in par. 2305, shall be separated from other parts of the building by construction having a fire resistance rating of at least one hour with automatic or self-closing fire doors protecting all openings between such rooms and other parts of the building.

2327. All new buildings shall be of fire-resistive construction throughout except that combustible construction may be used for one-story buildings to the extent permitted by par. 2328.

2328. Combustible construction shall not be employed in any new building construction except for buildings not exceeding 5000 sq. ft. in area of building or of section thereof separated from other sections by fire walls, provided that the height of any window sill in patient rooms does not exceed 72 in. above the grade immediately below it and provided that no floor (except an unoccupied attic) is more than 8 ft., 6 in. above grade level at any point next to the building. Service and entrance areaways encompassing not more than 10 per cent of the perimeter of the building may be omitted from the determining grade level.

2329. Wood stud walls, ceilings and partitions in new buildings of combustible construction shall have at least 1 hour fire resistance rating.

Alarms, Drills, Lighting and Signs

2331. Manually operated fire alarm systems, in accordance with Section 45, shall be provided for hospitals and sanitariums which sound an audible alarm in departmental offices, the engineering office, fire brigade headquarters, nurses' quarters, and such other central locations where gongs, sirens, whistles or bells will not disturb patients. Distinctive visual or audible alarms shall be installed at each nurse's station and used for fire alarm purposes only.

Alarm sending stations should be so located as to be readily available in all portions of the premises, to the end that when a fire is discovered by any one who is qualified to send an alarm, he may reach a station from which aid may be summoned without being required to leave the zone of his ordinary activities or to pass out of the sight and hearing of those im-

mediately exposed by or in direct view of the fire. The operation of an alarm sending station should automatically act to summon aid of all attendants who can properly be spared from their usual wards or areas for the purpose of assisting in the removal of physically helpless occupants and in controlling mentally incompetent occupants. The aid so summoned should also include an adequately manned and equipped municipal fire department, if such a department is so situated as to assure prompt arrival. Otherwise, there should be an adequate local or private fire brigade, which will be summoned.

2332. Every hospital shall be equipped with a communications system suitable for alerting all persons charged with duties for patient care and all employees of the hospital who are within the building in the event of emergency. The alerting system shall be capable of being operated from the telephone switchboard and the administrative office.

The alerting system here specified has a separate function from that of the manual fire alarm system required by par. 2331. Unlike the alarm system, the alerting system may be used for paging or other hospital operating functions.

2333. In all hospitals, the management shall designate sufficient personnel, providing twenty-four hour coverage, charged with specific responsibility for taking effective action in case of fire and for immediately notifying the fire department as soon as any fire is suspected or discovered.

Hospitals should be patrolled at not less than hourly intervals, the person charged with this responsibility visiting all parts of the premises not under continuous observation by persons charged with duties for patient care, including stairways, passageways, corridors, exit doorways, closets, attics, etc., to maintain exits, exit lighting, and fire protection equipment in working order and who should cause an immediate alarm to be transmitted in case of fire or suspicion of fire, such as smoke or excessive heat in any part of the building.

2334. Fire exit drills shall be conducted in accordance with Section 51.

2335. Auditoriums, assembly rooms, large wards, stairways, exits and exitways shall have illumination in accordance with the requirements of Section 52 Type 1 emergency lighting.

2336. Exit signs shall be installed in accordance with Section 53.

2337. After dark if more than fifty persons are gathered in rooms having an illumination less than one-tenth of a foot candle the exits from rooms and all passages to the exits of the building shall be indicated by adequately illuminated exit signs so as to clearly indicate the path of safe exit from the building in case of emergency.

EXISTING HOSPITALS

2340. Existing buildings shall be made to conform to the preceding requirements except in so far as these provisions are specifically waived by pars. 2341–2349.

It is recommended that existing buildings be made to conform to the foregoing requirements as far as possible. The following requirements for existing buildings afford a minimum degree of safety for such buildings. Each building should be taken as a special case to be considered on its own merits. In general it will be found that the installation of automatic sprinklers will be the most satisfactory method of compensating for construction deficiencies in existing hospital and institutional buildings.

2341. Stairways and other exits shall be the same in existing buildings as hereinbefore specified for new buildings except as provided in pars. 2342, 2343 and 2344.

2342. Stairways may be used as required exits in buildings used for bedridden patients (requirements of par. 2312 waived).

2343. Exit width for hospital and infirmary section shall be not less than 40 inches, instead of 44 inches as specified in par. 2314.

2344. If existing exits are insufficient according to pars. 2312 and 2313 required additional exit capacity shall be obtained by adding:

(*a*) Horizontal exits or doors directly outside.

(*b*) Stairways or ramps.

(*c*) Class A Fire Escape Stairs in accordance with Section 35 not less than 48 inches wide.

Straight run stairs are preferred.

(*d*) Enclosed slide escapes in accordance with Section 36.

2345. Existing Type 3 emergency lighting may be accepted in lieu of Type 1 (modifies par. 2335).

2346. Existing buildings of combustible construction may be continued in use for hospital purposes if protected throughout by a standard system of automatic sprinklers. (Waives pars. 2327, 2328, 2329.)

2348. Interior finish in existing buildings shall be Class B in corridors, exit ways and other space not otherwise specified, and Class C in individual rooms of not over 4 persons capacity,

all as specified in Section 44 and subject to the modifications therein provided. (Waives par. 2325.)

Section 44 provides for the application of flame retarding paint to correct excessive flame spread characteristics of existing interior finish, and also makes certain modifications in requirements where automatic sprinklers are installed.

2349. For existing buildings in lieu of fire-resistive construction with standard fire doors specified by par. 2326 for rooms of hazardous occupancy the following construction may be permitted:

Rooms or sections shall be enclosed in fire-stopped wood stud partitions, double wooden floors on fire-stopped joists and protected in each room thereof by metal lath and ¾ inch gypsum or cement plaster. Doors communicating with other portions of the building shall be self-closing not less than 1¾ inches thick, of solid, flush construction and metal clad on the hazardous side.

NEW NURSING, CONVALESCENT AND OLD AGE HOMES

Application, New Construction, Conversions, Additions

2350a. A NURSING, CONVALESCENT or OLD AGE HOME means a building used for the lodging, boarding or nursing care on a 24-hour basis of infants, convalescents or aged persons, but shall not include hospitals and mental or correctional institutions. HOME or NURSING HOME, wherever used in this code, shall include nursing, convalescent or old age homes.

b. Nursing homes hereafter erected and additions thereto shall comply with all requirements for new nursing homes.

c. Each building heretofore or hereafter erected shall comply with all requirements for new nursing homes before being converted to nursing home use.

d. Each addition to a new nursing home, and each addition other than bathrooms, toilets or stairways, to an existing nursing home or to any existing building converted to nursing home use shall be such that the entire resulting building conforms to all requirements for new nursing homes, or the addition shall be separated from the older structure by a fire partition having at least a 2-hour fire resistance rating. Each communicating opening therein shall be protected by an approved swinging fire door so installed that it may normally be kept in open position but will close automatically in case of fire or may be released manually to self-closing action.

Occupancy Restrictions

2351a. Sleeping rooms or dormitories shall not be located in basements or cellars.

b. Any occupied attic or attic used for storage shall be counted as an additional story in determining permissible building height.

c. Occupancies not under the control of, or not necessary to, the administration of a nursing home are prohibited therein with the exception of the residence of the owner or manager.

Construction

Height Limits

2352a. Maximum height limits shall be as specified in the following table. Types of construction shall be in accordance with Section 41.

Types of Construction	Maximum Building Heights
Fire-resistive Construction	No limit
Protected Noncombustible Construction conforming to Note 3	2 stories, except 3 stories if equipped with an approved automatic sprinkler system
Noncombustible Construction conforming to Notes 1 and 3	1 story, except 2 stories if equipped with an approved automatic sprinkler system
Protected Ordinary Construction conforming to Notes 1 and 2	1 story if equipped with an approved automatic sprinkler system
Other Types of Construction	Not permitted

Note 1: Basements or cellars in buildings of Noncombustible and Protected Ordinary construction shall be of Protected Noncombustible construction and shall be separated from the first story by a noncombustible ceiling and floor system having a 1-hour fire resistance rating.

Note 2: Partitions in buildings of Protected Ordinary construction shall be of noncombustible materials or shall have a 1-hour fire resistance rating.

Note 3: Partitions in buildings of Noncombustible and Protected Noncombustible construction shall be of noncombustible materials.

b. In determining the height of a building in stories, the basement shall be considered as a story if the floor of the first story is more than 8 feet 6 inches above grade level at any point next to the building. Service and entrance areaways encompassing not more than 10 per cent of the perimeter of the building may be disregarded. An attic or roof space not used for storage and not occupied shall not be considered as a story.

Division of Floor Areas

2353a. Each floor occupied by 30 or more persons shall be divided into at least 2 fire sections by partitions having at least a 1-hour fire resistance rating. At least 30 sq. ft. per person shall be provided on each side for the total number of persons on the floor. Partitions shall have at least a 1-hour fire resistance rating. They shall extend to the roof in attics where the ceiling below has less than a 2-hour fire resistance rating. Openings in such parti-

tions shall occur only in public rooms or corridors and shall be protected by approved fire doors so installed that they may normally be kept in open position but will close automatically in case of fire or may be released manually to self-closing action.

b. No more than 150 feet of corridor without such partitions, as defined in par. a, shall be permitted. The enforcing authority may require additional partitions where he finds them necessary for the safety of the occupants.

In planning nursing home exits, arrangements should be made to transfer patients in their beds from one section of a floor to another section of the same floor separated by a fire partition. Where the building design will permit, the section of the corridor containing an entrance or elevator lobby should be separated from corridors leading from it by fire partitions. Such an arrangement, where the lobby is centrally located will, in effect, produce a smoke lock, placing a double barrier between the area to which patients may be taken and the area from which they must be evacuated because of threatening smoke and fire.

Exit Details

Number and Types, Exit Measurement

2354a. Exits shall be restricted to the following permissible types:

1. Doors (see Section 2356).
2. Stairs and Smokeproof Towers (see Section 2357).
3. Ramps (see Section 2357).
4. Horizontal Exits (see Section 2358).

b. At least two exits of the above types, remote from each other, shall be provided for each floor or fire section of the building. At least one exit in each floor or fire section shall be of Type 1, 2 or 3 as listed above.

c. The capacity, in number of persons for which exits shall be provided, shall be the maximum number of persons occupying the building, but not less than 1 person for each 150 sq. ft. gross floor area (entire area within outside walls with no deductions), nor less than the following for sleeping quarters or dormitories:

	Per person, net area of room (fractions of persons not counted)
Adults	75 sq. ft.
Children	50 sq. ft.
Infants	25 sq. ft.

The above areas are based on the use of hospital or single beds, cribs or bassinets, for adults, children and infants respectively.

d. The capacity of each permissible type of exit shall be based on its width in units of 22 inches as defined in Section 3011, each such unit having a capacity of 30 persons.

e. Revolving doors and other types of exits not specifically approved by Section 2354a shall not be counted as required exits, and shall not be installed except in situations such as revolving doors at a main entrance where not subject to emergency exit use by patients. Elevators in accordance with Section 38 constitute a desirable supplementary facility, but are not counted as required exits.

Access, Aisles and Corridors

2355a. Aisles and corridors and exit location and access shall be in accordance with Section 31, except as modified in b, c, d and e below.

b. Exits shall be so placed that the entrance door of every private room and every point in open wards, day rooms, dormitories and dining rooms shall be not more than 100 feet (along the line of travel) from the nearest exit.

c. Aisles and corridors leading to exits shall be not less than 44 inches in clear width to permit the transportation of patients on beds, litters, or mattresses. Additional width shall be provided wherever necessary for change in direction in the movement of beds.

Where beds are to be moved from an individual room or ward into a corridor, ample corridor width is needed. A minimum of 8 feet is suggested.

d. Exits shall be so arranged that there are no pockets or dead ends exceeding 30 feet in which occupants might be trapped.

e. Ramp and stair enclosures shall be located adjoining exterior walls and shall discharge directly outside, but they may be located elsewhere provided the fire resistive corridor required by Section 3131 leading therefrom to the outside is unpierced.

Doors

2356a. Doors shall be in accordance with Sections 30 and 32, except as modified in b, c, d, e and f below.

b. Outside landings to which exit doors discharge shall be located at points where the finish grade is not more than 5 risers higher or lower than the exit door sill.

Wherever possible, outside stairs should be eliminated in favor of ramps, particularly in 1 story buildings so that beds on casters can be rolled quickly to the outside without removing the patients from the beds.

c. No locks shall be installed on patient room doors, except in accordance with Section 2302.

d. All doorways to patient occupied spaces and all doorways between the patient occupied spaces and the required exits shall be at least 44 inches in clear width to permit the transportation of patients on beds, cots, litters or mattresses from one section to another or to the outside.

e. Doors to any room accommodating more than 4 persons shall swing with exit travel.

f. Revolving doors shall be used only in accordance with par. 2354e.

Stairs, Smokeproof Towers, Ramps

2357a. Stairs and smokeproof towers shall be in accordance with Sections 30 and 33, and shall be Class A or Class B, and shall be enclosed in accordance with Sections 4301, 4303 and 4304.

b. Ramps shall be in accordance with Sections 30 and 34, and shall be Class A or Class B.

c. Minimum width of stairs, smokeproof towers and ramps shall be 44 inches.

Horizontal Exits

2358. Horizontal exits shall be in accordance with Sections 30 and 39, and shall be at least 44 inches in clear width.

Protection

Protection of Vertical Openings and Fire Stopping

2359a. Stairways, ramps, elevator shafts, light and ventilation shafts, chutes and other openings between stories shall be enclosed in accordance with Sections 4301, 4303 and 4304, except that fire doors protecting exit doorways therein shall be so installed that they may normally be kept in open position but will close automatically in case of fire or may be released manually to self-closing action.

b. Fire stopping shall be provided in accordance with Sections 4371 and 4372.

Interior Finish

2360. Interior finish shall be Class A in accordance with Section 44 except that Class C materials may be used in individual rooms of not over 4 persons capacity.

Automatic Sprinklers, Fire Detection and Alarm Systems

2361a. Unless automatic sprinkler protection is provided, automatic fire detection systems shall be provided in all nursing homes in accordance with Section 45.

b. Required automatic sprinkler systems shall be in accordance with Section 46, for systems in light hazard occupancies.

c. The sprinkler piping for any isolated hazardous area which can be adequately protected by a single sprinkler head may be connected directly to a domestic water supply system having a flow of at least 25 gallons per minute at 15 pounds per square inch residual pressure at the sprinkler head. An approved shutoff valve shall be installed between the sprinkler head and the connection to the domestic water supply.

d. Every nursing home shall have a manually operated fire alarm system, in accordance with Section 45, except that visible alarm devices may be used in patient areas. Audible alarm devices shall be used in non-patient areas.

The system required by this paragraph may be the same system as required by paragraph a above, if so equipped as to perform both functions.

Fire Extinguishers

2362. Approved first aid fire appliances shall be provided in accordance with the Standard of the National Fire Protection Association for Portable Fire Extinguishers (NFPA No. 10). They shall be so located on each floor that a person will not have to travel more than 100 feet from any point to reach the nearest unit. At least 1 unit shall be required for each 2500 sq. ft. of floor area or fraction thereof. In addition, an approved first aid fire appliance shall be installed at each kitchen and work shop.

Air Conditioning, Ventilating, Heating, Cooking and Other Service Equipment

2363a. Air conditioning, ventilating, heating, cooking and other service equipment shall be in accordance with Section 47, except as modified in b and c below.

b. Fuel burning space heaters and portable electric space heaters are prohibited.

c. Combustion and ventilation air for boiler or heater rooms shall be taken directly from and discharged directly to the outside air.

Hazardous Areas

2364a. Boiler and heater rooms shall be separated from the rest of the building by construction having a fire resistance rating of at least 1 hour. Any openings between such rooms and other areas shall be protected by approved automatic or self-closing fire doors.

b. Hazardous areas such as those listed below and other areas with contents which may be easily ignited, burn with an intense flame, or result in the production of dense smoke and fumes, shall be protected by an approved automatic sprinkler system or in lieu thereof shall be separated from other parts of the building by construction having a fire resistance rating of at least 1 hour, with any communicating openings protected by approved fire doors.

1. Repair Shops
2. Hobby Shops
3. Closets, rooms or spaces used for storage of combustible supplies and equipment such as: Brooms, Insecticides, Furniture, Mattresses, Mops, Paint, Floor Wax

The early discovery and extinguishment of fires in hazardous areas is more important to life safety than the confinement of such a fire to the area by fire resisting construction. It is therefore recommended that each hazardous area be protected by automatic sprinklers.

Operating Features

Attendants, Evacuation Plan, Fire Exit Drills

2365a. Every nursing, convalescent or old age home shall have at least one attendant on duty, awake and dressed therein at all times, and, in addition, one stand-by attendant within hearing distance and available for emergency service. These attendants shall be at least 18 years of age and capable of performing the required duties of evacuation. No person other than the management or a person under management control shall be considered as an attendant.

b. Every nursing, convalescent or old age home shall formulate a plan for the protection of all persons in the event of fire and for their evacuation to areas of refuge and from the building when necessary. All employees shall be instructed and kept informed respecting their duties under the plan.

c. Every mattress shall be provided with strong handles so that it can serve as a stretcher.

d. Beds in sleeping quarters and dormitories occupied by patients or inmates shall be equipped with casters at least 2 inches in diameter, with tires of rubber or similar material.

Smoking

2366. Smoking shall be permitted only where proper facilities are provided. Smoking shall not be permitted in sleeping quarters or dormitories, except at such times as supervision is provided.

Exit Lighting and Signs

2367a. Exit lighting and exit signs shall be in accordance with Sections 52 and 53, except as modified in b and c below.

b. Section 5202 shall apply.

c. Exit signs are not required in 1 story buildings with a patient capacity of less than 30 persons.

Furnishings and Decorations

2368a. All combustible decorative and acoustical material, including textile floor coverings and curtains located in corridors, passageways or stairway enclosures and in lobbies or other rooms or spaces for use by occupants or visitors shall be rendered and maintained flameproof.

b. Fresh cut flowers and decorative greens, as well as living vegetation, may be used for decoration, except those containing pitch or resin.

Maintenance

2369. Exits and equipment shall be maintained in accordance with Section 56.

EXISTING NURSING, CONVALESCENT AND OLD AGE HOMES

2370a. This division of this section applies to existing buildings or groups of buildings used for the boarding, lodging or nursing care on a 24-hour basis of four or more infants or children, convalescents or aged persons.

Day nurseries may be treated either as nursery homes or as schools depending upon conditions. Where the number of occupants is less than four, Section 24 may be applied.

b. The capacity, in number of persons for which exits shall be provided in nursing, old age and convalescent homes, shall be the maximum number of persons occupying such buildings, but not less than 1 person for each 150 sq. ft. gross floor area (entire area within outside walls with no deductions), nor less than the following for sleeping quarters or dormitories:

	Per person, net area of room (fractions of persons not counted)
adults	75 sq. ft.
children	50 sq. ft.
infants	25 sq. ft.

c. Sleeping quarters or dormitories shall not be occupied by any greater number of persons than their capacity as determined by paragraph **b** above.

d. No occupancy not under the control of, or necessary to, the administration of a nursing, convalescent or old age home shall be contained in any building used by infants, children, convalescents or elderly persons as sleeping quarters or dormitories.

Construction and Protection

2372a. No nursing, convalescent or old age home shall be occupied beyond the height limits specified as follows:

Combustible Construction (less than 1 hour fire resistance)

1 story. An automatic sprinkler system as specified in par. 2380 or an automatic fire detection system as specified in par. 2381 shall be installed.

2 stories or more. An automatic sprinkler system as specified in par. 2380 shall be installed.

1-hour construction (including construction over 1 hour but less than 2 hours)

1 or 2 story. An automatic sprinkler system as specified in par. 2380 or an automatic fire detection system as specified in par. 2381 shall be installed.

3 stories or higher. An automatic sprinkler system as specified in par. 2380 shall be installed.

2-hour construction
No limit.

b. Types of construction specified in par. 2372a, and elsewhere in this text, shall be in accordance with Section 41.

c. Exterior walls of frame construction and interior stud partitions shall be firestopped so as to cut off all concealed draft openings both horizontal and vertical between any cellar or basement and the first floor. Such firestopping shall consist of suitable noncombustible material or of wood at least 2 in. thick (nominal).

d. In determining the height of buildings for the purpose of par. 2372a and other sections of this standard the basement shall be considered as a story if the floor of the principal story ("first floor") is more than 8 ft. 6 in. above grade level at any point next to the building. Service and entrance areaways encompassing not more than 10 per cent of the perimeter of the building may be omitted from the determining grade level. An unoccupied attic or roof space shall not be considered as a story.

Division of Floor Areas

2373a. All floors above the first floor having a maximum occupancy exceeding 30 persons shall be divided into two sections by a fire wall, fire partition or smoke barrier so located as to provide ample space on each side for the total number of beds on the floor. Doors provided in such fire walls or fire partitions shall be fire doors and, in such smoke barriers, shall be fire doors or smoke-resistive doors, as described in the following paragraph, so installed that they may normally be kept in open position, but will close automatically or may be released manually to self-closing action.

b. Smoke barriers shall be not less fire resistive than ⅜-inch gypsum board on both sides of wood studs. Openings therein shall be provided with wired glass or self-closing, smoke-resistive doors in accordance with par. 3231.

Exit Details

2374a. Exits shall be of the following types, or combinations thereof (for details see Chapter III).

1. Horizontal exits
2. Doors leading directly outside the buildings (without stairs)
3. Ramps
4. Stairways

b. At least two exits of the above types, remote from each other, shall be provided for every floor or section of the building. At least one exit in every floor or section shall be of Type 2, 3, or 4 as listed above. Exterior fire escape stairs complying with Section 35 may be accepted by the enforcing authority as a second means of exit.

c. At least one required exit from each floor above or below the first floor shall lead directly, or through an enclosed corridor, to the outside. A second or third required exit, where a more direct exit is impracticable, may lead to a first floor lobby having ample and direct exits to the outside.

d. Exits shall be of such number and so located that the distance of travel from the door of any occupied room to an exit from that floor shall not exceed 50 feet in an unsprinklered building nor 75 feet in a sprinklered building.

e. The aggregate width of exits shall be such as to provide at least one 22-inch exit unit for each 15 persons or fraction thereof of the maximum occupancy of any floor served as determined by par. 2370b.

Construction and Arrangement

2375a. Stairs, ramps, corridors, doors, fire escapes and other exit features shall be of construction and arrangement conforming to the general provisions of the Building Exits Code except as here modified.

b. All stairs, ramps, or other ways of exit for areas shall be of such width and so arranged as to avoid any obstruction to the convenient removal of non-ambulatory persons by carrying them on stretchers or on mattresses serving as stretchers.

A standard 44 in. wide stairway or ramp is the minimum recommended. A person on a 39 in. wide mattress may be carried through a 40 in. doorway. Where persons are to be carried on mattresses or stretchers, extra space may be needed to make turns at stair landings.

Access

2376a. Each occupied room shall have at least one doorway opening directly to the outside, or to a corridor leading directly or by a stairway or ramp to the outside, or to an adjacent room which has such access to the outside.

b. Doorways serving as exits, or parts of exits shall be at least 36 inches wide, except that doors not less than 30 inches wide may be accepted by the enforcing authority.

c. Corridors and passageways to be used as a means of exit, or part of a means of exit, shall be at least 36 inches wide.

d. Corridors and passageways to be used as a means of exit, or part of a means of exit, shall be unobstructed and shall not lead through any room or space used for a purpose that may obstruct free passage. Corridors and passageways which lead to the outside from any required stairway shall be enclosed as required for stairways (par. 2378).

Protection of Vertical Openings

2378a. Interior stairways shall be protected by complete enclosures with walls having fire resistance rating appropriate to the type of building construction to protect the stairway as a means of exit and to prevent the spread of fire or smoke up the stairway from floor to floor, except that where a standard stairway enclosure is impracticable, partitioning with similar materials to cut off the stairway at floor levels may be accepted.

Section 43 specifies enclosures for stairways and protection of other vertical openings. For new buildings required to be fire-resistive, 2 hour construction is specified for buildings over four stories; other new construction 1 hour; existing buildings ½ hour.

b. All doorways in stairway enclosures or partitions shall be provided with approved self-closing fire doors, except that no such doors shall be required for doorways leading directly outside the buildings.

c. Vertical openings other than stairways shall be protected as required above for stairways, except that automatic sprinkler protection may be accepted in lieu of enclosure.

Interior Finish

2379. Interior finish shall be Class A or Class B in accordance with Section 44 in all exit ways and in passageways or corridors leading thereto. Interior finish in individual rooms may be Class C.

Automatic Sprinklers

2380. Where automatic sprinkler systems are installed to meet the requirements of this standard, they shall be approved standard systems with water-flow alarm, protecting the entire building, including unoccupied spaces such as attics, except that where a single automatic sprinkler is installed for protection of a vertical opening, such as a laundry chute, or for protection of small hazardous areas such as a closet used for combustible storage, such a single sprinkler may be connected to the domestic water supply system.

For further information see Section 46.

Where public water supplies are lacking or are inadequate for an automatic sprinkler system, a pressure tank system may be used.

Fire Detection Systems

2381. Where fire detection systems are installed to meet the requirement of this standard they shall be approved electrically supervised systems protecting the entire building, including unoccupied spaces such as attics. Where fixed temperature devices are used they shall be constructed to operate at 165° F or less, except that in spaces where high temperature is normal, devices having a higher operating point may be used. Operation of a thermostatic device shall cause an alarm which is audible throughout the building or, where advisable because of the type of occupancy, the system may be so arranged that the initial alarm signal will sound only at some central point where 24-hour service is maintained.

For further details see Section 45.

Fire Extinguishers

2382. Approved-type fire extinguishers shall be provided on each floor, so located that a person will not have to travel more than 75 feet from any point to reach the nearest extinguisher. An additional extinguisher shall be provided in, or adjacent to, each kitchen or basement storage room.

For information on extinguishers, see "Portable Fire Extinguishers," National Fire Codes, Vol. IV; NFPA Pamphlet No. 10; NBFU Pamphlet No 10.

Heating

2383. Heating shall be by a central system supplying steam, hot water or hot air, except that existing space heaters may continue

to be used where approved as to type and installation by the enforcing official. All furnace rooms shall be supplied with outside air sufficient for proper combustion. All furnaces and other fired units shall be vented by suitably constructed and protected smoke pipes and chimneys. All furnaces and other fired units shall be separated from combustible surfaces by sufficient air space, the application of noncombustible insulation, or both. Portable heaters, except electric heaters in bathrooms, shall not be used.

Hazardous Areas

2384a. Boiler or heater rooms shall be separated from other areas by construction having a fire resistance rating of at least one hour; any openings between such rooms and other areas shall be protected by automatic or self-closing fire doors.

Unlike other hazardous areas where automatic protection may be used in lieu of fire-resistive separation, this requirement applies irrespective of whether or not automatic sprinkler or automatic fire detection is provided.

b. Hazardous areas such as those listed below or other areas with contents which may be easily ignited, burn with an intense flame, or result in the production of dense smoke and fumes, shall be separated from other parts of the building by construction having a fire resistance rating of at least one hour, with any openings protected by fire doors, or in lieu of such construction shall be protected by an approved automatic fire detection or automatic sprinkler system.

attics
basements
carpenter shops
cellars
paint shops
upholstery shops

Closets, rooms or spaces used for storage of combustible supplies and equipment such as:

brooms
insecticides
furniture
floor wax
mattresses
mops
paint

Equipment and Operational Features

Attendants, Evacuation Plan

2385a. Every nursing, convalescent or old age home shall have at least one attendant on duty, awake and dressed therein at all times, and, in addition, one stand-by attendant within hearing

distance and available for emergency service. These attendants shall be at least 18 years of age and capable of performing the required duties of evacuation. No person other than the management or a person under management control shall be considered as an attendant.

b. Every nursing, convalescent or old age home shall formulate a plan for the protection of all persons in the event of fire and for their evacuation to areas of refuge and from the building when necessary. All employees shall be instructed and kept informed respecting their duties under the plan.

c. Every mattress shall be provided with strong handles so that it may serve as a stretcher when necessary for evacuation.

For further information on emergency evacuation procedures see Section 51.

Smoking

2386. Smoking may be permitted in nursing, convalescent or old age homes only where proper facilities are provided. Smoking shall not be permitted in sleeping quarters or dormitories, except at such times as supervision is provided.

Signs and Lighting

2387a. Signs bearing the word "Exit" in plainly legible block letters shall be placed at each exit opening, except at doors directly from rooms to exit corridors or passageways and except at doors leading obviously to the outside from the entrance floor. Additional signs shall be placed in corridors and passageways wherever necessary to indicate the direction of exit. Letters of signs shall be at least 6 inches high, except that the letters of internally illuminated exit signs may be not less than 4½ inches high. All exit and directional signs shall be maintained clearly legible by electric illumination or other acceptable means when natural light fails.

For further information see Section 53.

b. All stairways and other ways of exit and the corridors or passageways appurtenant thereto shall be properly illuminated at all times to facilitate egress in accordance with the requirements for exit lighting specified in Section 52.

c. Where the maximum occupancy of the building is 30 or more, as determined in accordance with par. 2370b, Type 1 or Type 2

emergency exit lighting shall be provided as specified in Section 52.

Combustible Contents

2388a. All combustible decorative and acoustical material, including textile floor coverings and curtains located in corridors, passageways or stairway enclosures and in lobbies or other rooms or spaces for use by occupants or visitors, shall be rendered and maintained flame-resistant.

b. Fresh cut flowers and decorative greens, as well as living vegetation, may be used for decoration, except those containing pitch or resin.

Maintenance

2389. Exits and equipment shall be maintained in accordance with Section 56.

PENAL INSTITUTIONS

2391. Exits and other features shall be the same as hereinbefore specified for hospitals, in so far as applicable.

Institutions of the type where security is provided by some outside wall or other barrier to escape, rather than through locking individual buildings may permit free exit into a yard area with exit facilities the same as for any non-penal institution.

2392. Reliable means shall be provided to permit the prompt release of inmates from any locked section in case of fire or other emergency.

2393. Wherever any inmates are confined in any locked rooms or spaces adequate guards or other personnel shall be continuously on duty or immediately available to provide for release of inmates or for such other action as may be indicated in case of fire or other emergency.

2394. No building constructed in whole or in part of combustible materials shall be used to confine inmates in cells or sleeping quarters, unless automatic sprinkler protection is provided in accordance with Section 46.

2395. All buildings or sections of buildings in penal institutions used for manufacturing, storage or office purposes shall have exits in accordance with the sections of Chapter II applicable to such occupancies in so far as practicable.

SECTION 24. RESIDENTIAL OCCUPANCIES

2400. Residential occupancies shall include all occupancies so classified in par. 2004. They shall be classified in the following groups, subject to determination by the enforcing authority.

See par. 1010 relative to discretionary powers of enforcing authority.

A. Hotels. Includes buildings or groups of buildings under the same management in which there are more than 15 sleeping accommodations for hire, primarily used by transients who are lodged with or without meals, whether designated as a hotel, inn, club, motel, or by any other name. So-called apartment hotels shall be classified as hotels because they are potentially subject to transient occupancy like that of hotels.

B. Apartment Houses. Includes buildings furnishing living quarters for three or more families living independently of each other and with independent cooking facilities, whether designated as apartment house, tenement, garden apartment or by any other name.

An essential difference between hotels and apartments lies in the fact that apartments are generally subject to continuing occupancy by the same persons for a sufficient length of time so that most occupants may be assumed to be familiar with the building and its exit facilities.

C. Dormitories. Includes buildings where group sleeping accommodations are provided for persons not members of the same family group in one room or in a series of closely associated rooms under joint occupancy and single management, as in college dormitories, fraternity houses, military barracks, ski lodges; with or without meals.

D. Lodging or Rooming Houses. Includes buildings or groups of buildings under the same management in which separate sleeping rooms are rented providing sleeping accommodations for a total of 15 or less persons, on either a transient or permanent basis; with or without meals, but without separate cooking facilities for individual occupants, except that where rooms are rented for not more than three persons in any private dwelling unit the provisions for the private dwelling shall apply.

E. One- and Two-family Dwellings. Includes private dwellings each occupied by members of a single family group and with total sleeping accommodations for not more than 20 persons, with rooms rented to outsiders, if any, not accommodating more than three persons. If sleeping accommodations for more than 20 persons are provided in one building, it shall be subject to the requirements for apartments or dormitories.

General

(Applies to all the following Groups, A, B, C, D, and E)

2401. The capacity of residential occupancies in numbers of persons for whom exits are to be provided shall be determined on the basis of one person per 125 sq. ft. gross floor area, or the maximum probable population of any room or section under consideration, whichever is greater. The capacity of any open mezzanine or balcony shall be added to the capacity of the floor below for the purpose of determining exit capacity.

Dormitory type occupancy, particularly where 2- or 3-tier bunks are used with close spacing, may produce a population density substantially greater than one person per 125 sq. ft. gross floor area. However, even though sleeping areas are densely populated, the building as a whole will not necessarily exceed one person per 125 sq. ft. gross area, owing to the space taken for toilet facilities, halls, closets, and living rooms not used for sleeping purposes.

2402. Exits, arranged as specified elsewhere in this section of the Code, shall be sufficient to provide for the capacity in numbers of persons as determined in accordance with par. 2401, on the following basis:

Floors above the street, or basements
One exit unit for each 30 persons

Street floor
One exit unit for each 50 persons, plus exits to serve stairs, if any, discharging through street floor area.

Requirements for location of exits within specified distances, and for two ways out, will in most cases provide exits more than sufficient to satisfy the requirements of par. 2402, except for street floor exits required to serve both street floor and stairs. Par. 2402, however, may be the determining requirement in cases of unusual plan or unusually dense occupancy of residential buildings. It provides exits theoretically sufficient to empty upper floors in 40 seconds after occupants are awake and at the point of entrance to exits, and in 50 seconds on street floors where there is generally less hazard. These times are less than comparable figures for occupancies not used for sleeping purposes (greater number of exit units in relation to population) on the assumption that sleeping persons may not be immediately aroused in case of fire and in any case cannot be expected to use exit facilities to their full efficiency immediately after awakening.

2403. Required exits, and means of access thereto, shall not be locked against exit travel at any time when buildings are occupied.

Where for operating reasons it may be desirable to discourage use of exits for other than actual emergency use, automatic alarms may be provided or other arrangements made for supervision over the use of exits. See Section 32, Doors.

A. HOTELS

2410. This part of this Section shall apply to hotels with accommodations for more than 15 persons, as defined in par. 2400.

2411. Not less than two exits, as remote from each other as practicable, shall be accessible from every floor, including basements occupied for hotel purposes, except as a single exit is permitted by par. 2413. Exits and ways of access thereto shall be so arranged that from every point in any open area, or from any room door, exits will be accessible in at least two different directions, except that not to exceed the first 35 ft. of exit travel from a room door may be along a corridor with means of exit only in one direction (dead end), and in open areas a single path of travel may be permitted for the first 35 ft.

2412. Exits as specified in par. 2411 shall be such that it will not be necessary to travel more than 100 ft. from the door of any room to reach the nearest exit, or 150 ft. where the automatic sprinkler protection is provided in accordance with Section 46, such protection to cover the entire building if not of fire-resistive construction, and at least to cover corridors, exit ways and all hazardous area in buildings of fire-resistive construction. Distances shall be determined in accordance with pars. 3021–25.

Par. 3022 permits measurement of distance from hotel room doors under specified conditions.

2413. Any room or section with an outside door at street or grade level may have such outside door as a single exit provided that no part of the room or area is more than 50 ft. from the door measured along the natural path of travel.

2414. In localities where there are no building codes or other legal requirements governing the height of hotels, the following may be utilized as a guide to good practice in respect to height limits for hotel buildings.

	Without Automatic Protection	*With Automatic Fire Detection (See Section 45)*	*With Automatic Sprinklers (See Section 46)*
Wood frame construction	2 stories	3 stories	3 stories
Ordinary construction	2 stories	3 stories	4 stories
Fire-resistive construction	No limit	No limit	No limit

Existing buildings, particularly when provided with automatic sprinkler protection, may appropriately be permitted higher than the above limits.

Upper Floor Exits

2421. Upper floor exits, arranged in accordance with pars. 2411–12, shall be of one or more of the following types, in accordance with Chapter III, with access in accordance with Section 31:

Stairways, Class A or Class B, in accordance with Section 33

Outside stairways, in accordance with Section 33

Smokeproof towers in accordance with Section 33

Ramps, Class A or Class B, in accordance with Section 34

Escalators, in accordance with Section 37

Horizontal Exits, in accordance with Section 39.

And, for existing buildings only:

Fire Escapes, in accordance with Section 35

Stairs, Class C, to extent accepted by enforcing authority

Ramps, Class C, to extent accepted by enforcing authority.

2422. Upper floor exits shall provide numbers of units of exit width sufficient to meet the requirements of par. 2402.

Hotels of not over 30,000 sq. ft. gross area per floor with normal population density will automatically satisfy the requirement by the provision of two 2-unit Class B stairways which are in any case needed to meet the requirement for two exits from every floor.

2423. Where stairways or other exits serve two or more upper floors the same stairway or other exit required to serve any one upper floor may also serve other upper floors, except that no inside open stairway, escalator or ramp may serve as a required egress facility from more than one floor.

Under this paragraph, if the second and third floor were each required to have three stairways, the second floor may use the stairways serving the third floor so that the total number of stairways required is three, not six.

If vertical openings between the first and second floors are unprotected, with open stairs providing the path of travel from the second floor to reach exits, the required stairs from the third floor must be separate, continuously enclosed down to the street floor.

Street Floor Exits

2424. Street floor exits, arranged in accordance with pars. 2411–12, shall be of one or more of the following types, all in accordance with Chapter III:

Doors, as per Section 32

Revolving Doors, as per Section 32 (not at foot of stairs)

Horizontal Exits, as per Section 39

Stairs, escalators, ramps or fire escapes, same as for upper floors, in case, due to differences in grade, part of the street floor is above grade

2425. Street floor exits shall provide units of exit width, as follows, capacity being determined in accordance with par. 2401:

One unit for each 50 persons street floor capacity for door or other level exit

One unit for each 30 persons street floor capacity for stair or other exit requiring descent to grade

One and one half door units for each 2-unit required stairway from upper floors discharging through the street floor

One and one half door units for each 2-unit required stairway from basement discharging through the street floor.

Basement Exits

2426. Basements occupied for hotel purposes shall have exits arranged in accordance with pars. 2411–12, of one or more of the following types, in accordance with Chapter III, with access thereto in accordance with Section 31:

Doors to outside at grade, as to a rear street or alley at basement level

Horizontal exits

Outside stairs up to street

Stairs up to street floor

Escalators up to street floor

Ramps up to street floor

Doors to subways, only if the subway meets the requirements for exit passageways or tunnels as specified in Section 31.

2427. Basement exits shall be sufficient to provide for the capacity of the basement as determined in accordance with par. 2401, as the basis of 50 persons per exit unit for travel on the same level, 30 persons for upward travel, as up stairs.

2428. Basements or sub-basements not open to the public and used only for heating equipment, storage and service operations (other than kitchens which are considered part of the hotel occupancy) shall have exits appropriate to their actual occupancy in accordance with other applicable sections of this Code, or in case of mixed occupancy where there may be doubt as to which other section is applicable, such basements shall have exits determined on the basis of one person per 100 sq. ft. gross area, 60 persons per exit unit, and 100 ft. travel to reach nearest exit, or 150 ft. if basement is sprinklered.

Protection of Vertical Openings

2431. All stairways, elevator shafts and other vertical openings shall be enclosed or protected in accordance with Section 43 except as otherwise permitted by pars. 2432–33.

All required exit stairs which are so located that it is necessary to pass through the lobby or other open space to reach the outside of the building shall be continuously enclosed down to the lobby level.

Where open stairways or escalators are permitted, they are considered as ways of travel to exits, rather than as exits, and requirements for distance to exits include the travel on stairs. (See par. 3023.)

2432. Unprotected vertical openings connecting not more than three floors used for hotel occupancy only may be permitted in accordance with the conditions of par. 4302, but without automatic sprinkler protection if the building is of fire-resistive construction and all interior finish is Class A or Class B as per Section 44; otherwise automatic sprinkler protection is required.

This permits an open mezzanine, and open stairs to basement areas used for hotel purposes, or open stairs to two mezzanine levels if openings to basement are protected.

2433. In existing buildings provided with a complete automatic sprinkler system in accordance with Section 46, and where exits and required ways of travel thereto are adequately safeguarded against fire and smoke within the building, or where every individual room has direct access to a fire escape or other exterior exit without passing through any public corridor, the protection

of vertical openings not part of required exits, may be waived by the enforcing authority to such extent as such openings do not endanger required means of exit.

2434. Basements used for only storage, heating equipment or other purposes other than hotel occupancy open to guests or the public, shall have no unprotected openings to floors used for hotel purposes.

Exit Details, Arrangement, Lighting Signs

2435. (a) At least half of the required number of units of exit width from upper floors, exclusive of horizontal exits, shall lead to the street directly or through a yard, court or passageway separated from all parts of the interior of the building.

Such exits will usually be enclosed stairways leading directly outdoors, or fire escape for existing buildings. In existing buildings where stairways are enclosed on upper floors but discharge into an open mezzanine in violation of the requirements of the above paragraph compliance may be secured in many cases by rearranging the stairway enclosure so that it will lead to an outside fire escape, as permitted by par. 3303.

(b) Where required exit stairs are so located that it is necessary to pass through the lobby, exit or other open space to reach the outside of the building, such lobby or other open space and all communicating rooms of combustible occupancy such as kitchens, shops and storerooms shall be protected with an automatic sprinkler system in accordance with Section 46, except that automatic sprinkler protection may be omitted in buildings of fire-resistive construction where the lobby or open space has Class A interior finish and no combustible contents except ordinary furniture, and all communicating rooms or spaces having any combustible interior finish or occupancy are cut off from the lobby, mezzanine or open space by fire-resistive walls or partitions with automatic or self-closing fire doors or fixed wired glass windows protecting all openings.

2436. (a) Access to all required exits shall be in accordance with Section 31. It shall be unobstructed and shall not be through a room used as a bedroom or bathroom (except exits serving only the individual room) nor shall such access be veiled from open view by ornamentation, curtain or other appurtenance.

(b) Aisles and corridors shall be in accordance with Section 31. No corridor exceeding 150 feet in length shall be permitted without a smoke barrier with smoke stop doors in accordance with par. 3231.

2437. All public spaces, hallways, stairways, and other exits shall have illumination in accordance with Section 52. Exitways shall be continuously illuminated at all times. All hotels with over 500 rooms shall have Type 1 emergency exit lighting; hotels with 25 to 500 rooms shall have Type 2 emergency exit lighting, provided that where each guest room has a direct exit to the outside of the building (as in motels) no emergency exit lighting shall be required.

2438. (a) Exits from public hallways or passageways on floors with sleeping accommodations shall have illuminated signs in accordance with Section 53. Where exits are not visible from every point in a hallway or passageway, illuminated signs shall be provided to indicate the direction to exits.

(b) There shall be conspicuously displayed in each sleeping room a clearly legible floor plan showing the arrangement of exits and the direction of travel to reach them.

Interior Finish

2440. Interior finish in accordance with Section 44, and subject to the limitations and modifications therein specified, shall be as follows:

For new construction or new interior finish

Exitways, Class A or Class B

Lobbies, corridors and public spaces, Class A or Class B

Individual guest rooms, Class A, B or C

Other rooms, Class A, B or C

Existing interior finish

Exitways, Class A or Class B

Lobbies, corridors and public spaces

Used as required path of exit travel, Class A or Class B

Not used as required path of exit travel, Class A, B or C

Individual guest room, Class A, B or C

Other rooms, Class A, B or C

Alarms and Drills

2441. (a) Alarm systems, in accordance with Section 45, shall be provided for all hotels having accommodations for 15 or more guests except where each guest room has direct exit to the outside of the building, as in motels.

(b) Sounding devices shall be of such character and so located as to arouse all occupants of the building or section thereof endangered by fire.

(c) An alarm sending station shall be provided at the hotel desk or other convenient central control point under continuous supervision of responsible employees. Additional alarm sending stations (as specified in Section 45) may be waived where there are other effective means (such as automatic sprinkler or automatic fire detection systems) for notification of fire. Where such additional alarm sending stations are so located as to be unduly subject to false alarms by irresponsible guests, they may be arranged to provide a suitable signal at a central control point where responsible employees are continuously on duty, rather than directly actuating sounding devices to arouse all occupants.

> Telephone systems as ordinarily installed in hotels do not meet the requirements of Section 45 and do not permit simultaneous notification of all guests. They may be useful in case of fire, but may not be substituted for alarm systems except in hotels having less than 15 guests.

(d) Suitable facilities shall be provided for immediate notification of the public fire department, or private fire brigade where there is no public fire department, in case of fire. Every fire shall be immediately reported.

2442. Fire exit drills shall be in accordance with the requirements on Emergency Organization of Hotel Employees, pars. 5131–33.

Air Conditioning and Ventilation

2443. (a) All air conditioning installations shall comply with Section 47.

(b) Transoms shall not be installed for the ventilation of sleeping rooms in new buildings. In existing buildings transoms may be permitted for the ventilation of sleeping rooms where corridors are not used as plenums for air-conditioning systems, and corridors, exitways and hazardous areas are protected by automatic sprinklers in accordance with Section 46.

Ventilation through louvers in doors is likewise undesirable in that it may permit the passage of smoke into the corridor from a fire in a room, or into the room from the corridor. It is, however, not specifically prohibited because it may be impracticable to provide smoke-tight hotel room doors even without louvers, and an opening at door height is considered less dangerous than at ceiling height where the smoke hazard is greatest.

Boiler Room and Hazardous Occupancies

2444. (a) Rooms containing high pressure boilers, refrigerating machinery, transformers or other service equipment subject to possible explosion should not be located directly under or adjacent to exits. All such rooms shall be effectively cut off from other parts of the building as specified in Section 49 and shall be provided with adequate vents to the outer air.

(b) All rooms or areas of hazardous occupancy in addition to those hereinbefore mentioned, shall be segregated or shall be protected as may be directed by the enforcing authority where in the opinion of the enforcing authority fire, explosion or smoke therefrom would be likely to interfere with safe egress from the building.

Public Assembly Occupancies

2445. All ballrooms, assembly or exhibition halls, and other spaces used for purposes of public assembly shall have exits in accordance with Section 21. Restaurants seating 200 or more persons or having a gross area of 8,000 sq. ft. or more shall be treated as places of assembly.

B. APARTMENT HOUSES

2451. Any apartment building which complies with all of the preceding requirements of this section for hotels may be considered as a hotel and as such the following requirements for apartments will not be applicable.

2452. Every individual living unit covered by this part of Section 24 shall at least comply with the minimum provisions of Part E, One- and Two-Family Dwellings.

2453. Exits and means of access thereto shall be so located that it will not be necessary to travel more than 50 ft. nor to traverse more than one flight of stairs, within any individual living unit to reach the nearest exit, or to reach an entrance door of the apartment which provides access through a public corridor to an exit on the same floor level within 100 ft. of the door, or within 150 ft. in a building protected by automatic sprinklers in accordance with Section 46.

See Section 30 for details of measuring distance of travel to exits.

2454. Every living unit shall have access to at least two separate exits which are remote from each other and are reached by travel in different directions, except that a common path of travel may be permitted for the first 20 ft. (*i.e.*, a dead end corridor up to 20 ft. long may be permitted) provided that a single exit may be permitted under any of the following conditions:

(*a*) Any living unit which has direct exit to the street or yard at grade, or by way of an outside stairway or an enclosed stairway with fire-resistance rating of 1 hour or more serving that apartment only and not communicating with any basement or other area not a part of the apartment served.

(*b*) Any building of fire-resistive construction of any height with not more than two living units per floor, with a smokeproof tower or an outside stairway as the exit, immediately accessible to all apartments served thereby.

(*c*) Any building not more than two stories in height with no basement, or, in case there is a basement, with the street floor construction at least 2 hours fire resistance and with street floor level not more than 8 ft. 6 in. above grade at any point next the building, excluding areaways or drive-

ways not more than 10 per cent of the perimeter, subject to the following conditions:

(1) The stairway is completely enclosed with 1 hour fire-resistive construction with self-closing fire doors protecting all openings between the stairway enclosure and the building.

(2) Access to the basement is only from the exterior of the building if the basement contains a heating plant, group storage, incinerator room or paint shop or other hazardous occupancy.

(3) All corridors serving as access to exits are of fire-resistive construction.

(4) There is not more than 20 ft. of travel distance to reach an exit from the entrance door of any living unit.

(5) The building or fire section served by the single exit contains a total of not more than 16 living units on the first and second floors, or not more than 12 units with a maximum gross area per floor of 4,000 sq. ft. if any part of the structure is of combustible construction.

2455. Exits, arranged in accordance with pars. 2453-54 shall provide sufficient capacity to accommodate all occupants on the same basis as hotels, and using the same types of exit facilities, all as provided in pars. 2421-2428.

2456. At least half of required exits shall discharge direct to the outside of the building; any other exits shall be the same as required for hotels, pars. 2435(a) and (b).

2461. Protection of vertical openings shall be the same as required for hotels, pars. 2431-2434 except that there shall be no unprotected vertical opening in any building or fire section with only one exit.

2462. All public spaces, hallways, stairways and other exits shall have illumination in accordance with Section 52. Any apartment building with more than 25 living units shall have Type 1 or Type 2 emergency exit lighting.

2463. Exit signs in accordance with Section 53 shall be provided in all apartment buildings having more than 8 living units in any one building or fire section.

2464. Interior finish in accordance with Section 44, and subject to the limitations and modifications therein specified shall be as follows:

For new construction or new interior finish
Exitways, Class A or B
Lobbies, corridors and public spaces, Class A or B
Individual living units, Class A, B or C

Existing interior finish
Exitways, Class A or B
Other spaces, Class A, B or C

2465. Apartment buildings, unless provided with automatic sprinkler protection in accordance with Section 46, or automatic fire alarms in accordance with Section 45, shall have manual fire alarm facilities in accordance with Section 45 if of combustible construction and more than three stories in height.

2466. Air conditioning and ventilating, when provided, shall be in accordance with Section 47.

2467. Any hazardous occupancies in apartment buildings shall be segregated or protected, or both, in accordance with Section 49.

C. DORMITORIES

2470. (a) Any dormitory complying with all the requirements for hotels may be accepted as such in which case the following provisions of Part C will not be applicable.

(b) Any dormitory divided into suites of rooms, with one or more bedrooms opening into a living room or study which has a door opening into a common corridor serving a number of suites shall be classed as an apartment house and shall be subject to all requirements of Part B of this Section in which case the following provisions of Part C will not be applicable.

2471. (a) All dormitories not otherwise covered under 2470(a) and (b) shall have exits so arranged that from any sleeping room or open dormitory sleeping area there will be access to two separate and distinct exits in different directions with no common path of travel unless the room or space is subject to occupancy by not more than 10 persons and has a door opening directly to the outside of the building at street or grade level, or to an outside stairway in which case one means of exit may be accepted.

(b) Exits shall be so arranged that it will not be necessary to travel more than 100 ft. from any point, or 150 ft. in a building protected by automatic sprinklers in accordance with Section 46, to reach the nearest outside door, stair or fire escape exit, nor to traverse more than a one-story flight of inside, unenclosed stairs.

2472. Exits from upper floors shall be sufficient to provide at least one unit of exit width for each 30 persons, using one or more of the following types of exits, all in accordance with Chapter III. Exits from basements, if occupied, shall be determined on the same basis as exits from upper floors.

For new dormitories
- Stairs, outside stairs or smokeproof tower, Class A or Class B
- Horizontal exits

For existing dormitories
- Stairs, outside stairs or smokeproof tower, Class A, Class B or Class C
- Horizontal exits
- Fire escapes, Class A or Class B
- Slide escapes

Existing exit facilities on existing dormitories
- With accommodations for not more than 20 persons above the street floor, Class C, or E Fire Escapes.

2473. Street floor doors shall be sufficient to provide one unit of exit width for each 50 persons capacity of the street floor, plus

one unit for each unit of required stairway width discharging through the street floor.

2474. All exit stairways and other vertical openings shall be enclosed or protected in accordance with Section 43, except unprotected openings may be permitted between the street floor and second floor or street floor and basement used for dormitory purposes if the building is of fire-resistive construction. In existing buildings of any type of construction unprotected openings to greater heights may be permitted by the enforcing authority if the building is protected by automatic sprinklers in accordance with Section 46; or if every sleeping room or area has direct access to an outside exit without the necessity of passing through any corridor or other space exposed to any unprotected vertical opening and the building is equipped with an automatic fire alarm system in accordance with Section 45.

2475. All interior finish of dormitories shall be Class A or B in exitways, Class C elsewhere, in accordance with Section 44.

2476. All dormitories shall have exit lighting in accordance with Section 52. Any dormitory, subject to occupancy by more than 100 persons, shall have Type 1 or Type 2 emergency exit lighting and exit signs in accordance with Section 53.

2477. Fire exit drills shall be regularly conducted in accordance with Section 51.

2478. All dormitories not equipped with an automatic fire alarm system in accordance with Section 45, or an automatic sprinkler system in accordance with Section 46, shall have a manual fire alarm system in accordance with Section 45.

2479. (a) All air conditioning installations shall comply with Section 47.

(b) Transoms shall not be installed for the ventilation of sleeping rooms in new buildings. In existing buildings transoms may be permitted for the ventilation of sleeping rooms where corridors are not used as plenums for air conditioning systems, and corridors, exitways and hazardous areas are protected by automatic sprinklers in accordance with Section 46.

Ventilation through louvers in doors is likewise undesirable in that it may permit the passage of smoke into the corridor from a fire in a room, or into the room from the corridor. It is, however, not specifically prohibited because it may be impracticable to provide smoke-tight dormitory room doors even without louvers, and an opening at door height is considered less dangerous than at ceiling height where the smoke hazard is greatest.

D. LODGING OR ROOMING HOUSES

2480. This part of this section applies only to lodging or rooming houses providing sleeping accommodations for less than 15 persons as specified in par. 2400.

2481. In addition to the following provisions, every lodging or rooming house shall comply with the minimum requirements for one- and two-family dwellings.

2482. Every sleeping room above the street floor shall have access to two separate means of exit, at least one of which shall consist of an enclosed interior stairway or an exterior stairway, or a fire escape or horizontal exit, all so arranged as to provide a safe path of travel to the outside of the building without traversing any corridor or space exposed to an unprotected vertical opening, except that traversing unprotected vertical openings may be permitted in existing sprinklered buildings.

2483. Any sleeping room below the street floor shall have direct access to the outside of the building.

2485. Exit lighting shall be provided in accordance with Section 52 and exit signs in accordance with Section 53.

2486. A manual fire alarm system in accordance with Section 45 shall be provided unless the building is equipped with an automatic fire alarm system in accordance with Section 45 or an automatic sprinkler system in accordance with Section 46.

E. ONE- AND TWO-FAMILY DWELLINGS

2490. This part of this section covers one and two-family private dwellings with sleeping accommodations for not more than a total of 20 persons as specified in par. 2400 and where the occupancy is so limited the only requirements applicable are those in paragraphs 2491–2497 and the general provisions of Section 10.

These provisions for one- and two-family dwellings are far short of complete requirements for fire safety, but are considered a minimum which can reasonably be applied with the force of law. There are many additional features which might well be required in the interest of safety, such as automatic sprinklers or automatic fire detection, duplicate exits, enclosed stairs, etc., but any attempt to require such more comprehensive safeguards might run counter to the traditional concept of maintenance of the sanctity of the home free from outside interference.

2491. Every occupied room (exclusive of areas used solely for storage) shall have access to at least one door or stairway providing a means of unobstructed travel to the outside of the building at street or grade level. No room or space shall be occupied which is accessible only by a ladder, folding stairs or through a trap door.

2492. No required path of travel to the outside from any room shall be through another room or apartment not under the immediate control of the occupant of the first room or his family, nor through a bathroom or other space subject to locking.

2493. All doors providing means of exit shall be not less than 24 in. wide.

Thirty-inch or wider doors are preferable.

2494. All stairways shall comply at least with the minimum requirements for Class C stairs in existing buildings, as described in Section 33 in respect to width, risers, treads and maximum pitch.

2495. Every sleeping room, unless it has two doors providing separate ways of escape, or has a door leading outside of the building directly, shall have at least one outside window which can be opened from the inside without the use of tools to provide a clear opening of not less than 18 inches in least dimension and 432 square inches in area, with the bottom of the opening not more than 4½ feet above the floor.

Windows may serve as a means of emergency escape, particularly where ladders can be raised by firemen or others. Even where the location is such as to preclude the use of windows for escape purposes, they may provide air for breathing in a smoke-filled room while trapped occupants are awaiting rescue. Windows should have sills not too high above the floor; windows lower than the specified maximum height above the floor are preferable.

Where awning or hopper type windows are used, they should be hinged or otherwise so arranged as to allow the side brackets to drop and permit the full opening to be used for egress. Where storm windows, screens, or burglar guards are used, these should be provided with quick opening devices so that they may be readily opened from the inside for emergency egress.

2496. In new buildings, interior finish of occupied spaces shall be no more hazardous than Class C as defined in Section 44; in existing buildings, Class D.

2497. No stove or combustion type heater shall be located directly under or immediately at the foot of stairs or otherwise so located as to block escape in case of malfunctioning of the stove or heater.

SECTION 25. MERCANTILE OCCUPANCIES

2500. Mercantile occupancies shall include all buildings and structures or parts thereof with occupancy as described in par. 2005.

2501. Mercantile occupancies shall be classified as follows:

Class A. All stores having aggregate gross area of 30,000 sq. ft. or more, or utilizing more than three floor levels for sales purposes.

Class B. All stores of less than 30,000 sq. ft. aggregate gross area, but over 3,000 sq. ft., or utilizing any floors above or below the street floor level for sales purposes, except that if more than three floors are utilized, the store shall be Class A.

Class C. All stores of 3,000 sq. ft., or less gross area, used for sales purposes on the street level only. (Balcony permitted, See Par. 2502 (b)).

2502 (a) For the purpose of the classification in par. 2501, the aggregate gross area shall be the total gross area of all floors used for mercantile purposes, and where a store is divided into sections by fire walls, shall include the area of all sections used for sales purposes. Areas of floors not used for sales purposes, such as a basement used only for storage and not open to the public, are not counted for the purposes of the above classifications, but exits shall be provided for such non-sales areas in accordance with their occupancy as specified by other sections of Chapter II.

(b) Floor level shall be as defined in Chapter VI provided however that one balcony or mezzanine floor having an area less than half of the floor below shall not be counted as a floor level for the purpose of applying the classification of par. 2501, but if there are two balcony or mezzanine floor levels, one shall be counted.

Note that the omission of one balcony from the count of number of floor levels in this case does not waive any of the exit requirements applying to balconies.

2503. Where a number of stores under different management are located in the same building or in adjoining buildings with no fire wall or other standard fire separations between, the aggregate gross area of all such stores shall be used in determining classification as per par. 2501.

2504. The capacity of mercantile buildings or parts of buildings used for mercantile purposes shall be the maximum capacity as determined by the enforcing authority, but not less than the following:

(*a*) Street or main floor, one person for each 30 sq. ft. gross floor area. In stores with no street floor, but accessible directly from the street by stairs or escalators, the principal floor level at the point of entrance to the store shall be considered the main floor. In stores where, due to differences in grade of streets on different sides, there are two or more floors directly accessible from streets (not including alleys or similar back streets) each such floor shall be considered a main floor for the purpose of determining capacity.

(*b*) Sales basements, same as street or main floor.

(*c*) Upper floors, used for sales, one person for each 60 sq. ft. gross floor area.

(*d*) Floors or sections used only for offices, storage, shipping and not open to the general public, one person for each 100 sq. ft. gross floor area.

(*e*) Floors or sections used for assembly purposes, capacity determined in accordance with Section 21.

These figures were established on the basis of counts of the population of typical store buildings during periods of maximum occupancy such as before Christmas or during special sales. In some cases, the actual occupancy may be more dense than indicated by these figures, but it may reasonably be assumed that in any large mercantile building, all areas will not be similarly crowded at the same time, and the average density of store population should seldom exceed these figures.

In some types of stores, the population will normally be much less than indicated, for example, in furniture stores. However, the character of mercantile operations is subject to such rapid changes that it is not prudent in designing exit facilities to assume that any store will never be crowded, and for this reason the same capacity figures are used for all types of stores.

2505. In case of mezzanines or balconies open to the floor below, or other unprotected vertical openings between floors as permitted by par. 2542, the population (or area) of the mezzanine or other subsidiary floor level shall be added to that of the main floor for the purpose of determining required exits, provided however that in no case shall the total number of exit units be less than would be required if all vertical openings were enclosed.

2506. Mercantile occupancies shall be classed as ordinary hazard in accordance with Section 12, except that they shall be classified as high hazard if high hazard commodities are displayed or handled without protective wrappings or containers, in which case the following additional provisions shall apply:

(*a*) Exits shall be so located that not more than 75 ft. of travel from any point is required to reach the nearest exit.

(*b*) From every point there shall be at least two exits accessible by travel in different directions (no common path of travel).

(*c*) All vertical openings shall be enclosed.

(*d*) Automatic sprinkler protection, explosion venting and/or such other protective features shall be provided as are appropriate to the particular hazard as determined by the enforcing authority.

Examples of high hazard mercantile occupancy: display of unwrapped articles fabricated from thin sheets of pyroxylin plastic such as artificial flowers or toys; dispensing of gunpowder or other explosives in bulk; dispensing of gasoline or flammable solvents by pouring into open containers.

Location of Exits

2511. Exits shall be so located that no portion of any floor area will be more than 100 ft. from the nearest exit, or 150 ft. in a building protected by a complete automatic sprinkler system in accordance with Section 46.

2512. Distance to exits shall be measured from the most remote point, along the natural path of travel, except that where floor areas are divided into rooms not used for sales purposes, such as offices, rest rooms or stock rooms, the distance may be measured from the room door, provided the room is of such size and so arranged that the maximum path of travel within the room to reach the room door does not exceed 50 ft.

See Pars. 3021-5 for further details on distance to exits and method of measurement.

2513. At least two separate exits shall be accessible from every part of every floor, including basements, of Class A and Class B stores, such exits to be as remote from each other as prac-

ticable and so arranged as to be reached by different paths of travel in different directions, except that a common path of travel may be permitted for the first 50 ft. from any point.

The purpose of this paragraph is to avoid pockets or dead ends of such size as to involve undue danger of persons being trapped therein in case of fire. It permits small areas such as rooms or alcoves with only one way out where the distance is small enough so that there is little likelihood that a fire might develop to such proportions as to block escape before the occupants were aware of the fire and made their way out.

It should be noted that par. 2513 refers to the distance from any part of any floor, and that where areas are divided into rooms, the distance of 50 ft. to room door permitted by par. 2512 is not to be added to the 50 ft. common path of travel permitted by par. 2513.

2514. In Class C stores, at least two separate exits shall be provided as specified by par. 2513, except that where no part of the store is more than 50 ft. from the street door measured along the natural path of travel, a second exit may be waived.

Street Floor Exits

2521. In Class A and Class B stores, street floor exit doors or horizontal exit doors, located as required by pars. 2511–13, shall be sufficient to provide the following numbers of units of exit width:

(*a*) One unit for each 100 persons capacity of street floor (3,000 sq. ft. gross area), plus

(*b*) One and one half units for each two units of required basement stairways discharging through the street floor, plus

(*c*) One and one half units for each two units of required stairways, discharging through the street floor, plus

(*d*) One and one half units for each two units of escalator width discharging through the street floor where escalators qualify as required exits or as means of access to required exits.

(*e*) If ramps are used instead of stairways, street floor doors shall be provided on the same basis as for stairways, with door width appropriate to the rated discharge of ramps as per Section 34.

2522. Street floor doors shall be in accordance with Section 32, and horizontal exit doors, if used, in accordance with Section 39 except that in Class C mercantile occupancies, doors may

swing in where such doors serve only the street floor area; all doors at the foot of stairs from upper floors or at the head of basement stairs shall swing with the exit travel.

Section 32 covers units of door width and various other details.

2523. Where revolving doors are used to provide part of the required number of units of street floor exit width, such doors shall be used in accordance with the provisions of Section 32, pars. 3251 and 3252.

These paragraphs require adjoining swinging doors, prohibit revolving doors at foot of stairs, and rate each revolving door as one-half a unit of exit width irrespective of the actual total width of the revolving door.

Upper Floor Exits

2524. Each floor above the street floor shall have exits, located as required by pars. 2511–13, sufficient to provide for the capacity of the floor, as determined by par. 2504 (*c*) and (*d*) as follows:

Class A or B stairs or smokeproof towers or outside stairs in accordance with Section 33

60 persons per unit of exit width (= 7,200 sq. ft. gross sales area per 44 in. stairway.)

Escalators, in accordance with Section 37, same as stairs if qualifying as required exits.

Horizontal exits, in accordance with Section 39

100 persons per unit of exit width (= 12,000 sq. ft. gross sales area per 40 in. doorway.)

In existing buildings only, Class A or Class B fire escapes in accordance with Section 35

60 persons per unit of exit width (= 7,200 sq. ft. gross sales area per 44 in. fire escape stairway.)

Ramps in accordance with Section 34 may be substituted for stairs, with rating appropriate to the class of ramp as per Section 34.

Where level outside exit from upper floors is possible owing to hills, such outside exits may serve instead of horizontal exits. If, however, the grade exit from the upper floor also serves as an entrance from a principal street, the upper floor shall be classed as a street floor in accordance with the definition in Chapter VI, and is subject to the requirements of this section for street floors.

2525. Where stairways, escalators, outside stairs, ramps or fire escapes serve two or more upper floors, the same stairway or other exit required to serve any one upper floor may also serve other upper floors, except that no inside open stairway, escalator or ramp may serve as a required egress facility from more than one floor.

Under this paragraph, if the second and third floors of a store building are each required to have three stairways, the second floor may use the stairways serving the third floor so that the total number of stairways required is three, not six.

If vertical openings between the first and second floor are unprotected, with open stairs providing the path of travel from the second floor to reach exits, the required stairs from the third floor must be separate, continuously enclosed down to the street floor.

Basement Exits

2526. Each floor below the street floor shall have exits, located as required by pars. 2511–13, sufficient to provide for the capacity of the floor, as determined by par. 2504 (*b*) and (*d*), as follows:

Class A or B Stairs or Smokeproof Towers or Outside Stairs in accordance with Section 33.

60 persons per unit of exit width (=3,600 sq. ft. gross sales area per 44 in. stairway.)

Escalators, in accordance with Section 37, same as stairs if qualifying as required exits.

Doors leading to outside the building at grade, as to a basement level street in the rear of the building, in accordance with Section 32.

100 persons per unit of exit width (=6,000 sq. ft. gross sales area per 40 in. doorway.)

Horizontal exits, in accordance with Section 39, same as doors leading outside.

2527. Where there are two or more basement floor levels, the same stairway or other exit may serve all floor levels (same principle as stated in par. 2525 for upper floors), but all required exits from sub-basements shall be independent of any open stairways between first basement and street floor.

Example of Exit Determination

2530. Assume a store building of fire resistive construction 150 x 300 feet outside dimensions, 45,000 sq. ft. gross area, eight stories and basement. The basement and seven lower stories are occupied for sales purposes, the top floor is occupied only for office and service purposes. The heating equipment is in a sub-basement.

The sales basement and second floor are reached by open unprotected escalators from the street floor, but there are no escalators above the second floor. Elevators, stairs and other vertical openings are enclosed. At the rear of the building there is an open alley at basement level.

Upper Floor Exits

The third to seventh floor, on the basis of an assumed capacity of one person per 60 sq. ft. gross floor area, which require exits sufficient for 750 persons per floor, or 12½ units of stairway width on the basis of 60 persons per unit, which is one stairway exit unit per 3,600 sq. ft. gross floor area. (45,000 ÷ 60 ÷ 60 = 12½)

These requirements may be met by providing six stairways, five of them 44 in. wide and one 56 in. wide. These stairways, properly enclosed and accessible from each floor, qualify as required exits for all floors they serve. They must be so arranged that no part of the floor area is more than 150 ft. from the nearest stairway, measured along the path of travel.

The top floor, with an assumed occupancy of one person per 100 sq. ft. gross floor area (instead of 60) will require one stairway exit unit per 6,000 sq. ft. gross area or a total of 7½ units. This requirement may be more than satisfied by extending any four of the six stairways up to the top floor, provided they are so located that the maximum distance of travel from any point to an exit is not more than 150 ft.

Three of the 44 in. stairways discharge through the open street floor as permitted by par. 2533, the other three, including the 56 in. (2½ unit) stairway are at the rear of the building and extend down to the basement level, discharging direct to the alley, thus being separated from any possible fire or smoke in the basement or street floor level.

The second floor requires the same exit facilities as sales floors above, but because of the unprotected open escalators, is differently treated. At least half of its required exit travel must be separated from the connected first floor area (par. 2533a); doors into the three rear stairways will satisfy this requirement.

Doors into the other three stairways will satisfy the requirement for the balance of the exits, or the open escalator may serve as one 2-unit path of exit travel, in which case access to one of the three front stairways may be closed at the second floor level if desired, provided that this still leaves exits within 150 ft. of any point.

If the escalators, instead of serving only the basement and second floor, were extended up to the seventh floor, with floor openings protected in accordance with par. 4320-52, but with no enclosing walls or partitions, the exit requirements would not be affected. The escalator could serve as a path of required exit travel from the second floor, but not from floors above unless enclosed as required for stairways.

Basement

The basement, used for sales purposes, has a rated capacity of one person per 30 sq. ft. gross floor area, or a total capacity of 1,500 persons for whom exits must be provided even though the maximum number of customers never reaches any such figure except in an occasional special sale.

Half of the required exit capacity for the basement may be up open stairs and through the street floor area to outside doors. It may be thus assumed that stairs to the street floor area will serve 750 persons, which, at 60 persons per stair unit, will require 12½ units of stairway width.

The up flight of the basement escalator may qualify as 2 of these units. The remainder may be provided by four 44 in. stairways and one 56 in. stairway, or by a smaller number of other stairways to give the same number of units of width.

Exit facilities for the remaining 750 persons capacity of the basement can be met by providing exit doors to the alley on the basis of one door unit per 100 persons, or a total of 7½ door units, using any desired arrangement such as three 40 in. doors (2 units) and one 36 in. door (1½ units).

The same outside doors that serve the enclosed stairways from upper floors may also serve as basement exits by providing doors swinging into the bottom of the stairway enclosure at basement level. If this is done, it may be possible to satisfy the basement rear exit requirement with a single doorway leading to the alley in addition to those serving the stairs, or these requirements may be satisfied without any additional doorway if the stairway doors at basement level are made appropriately wider than needed for the stairways alone.

The sub-basement boiler rooms, subject to occupancy by only a few employees, should have, in addition to the regular access which may be provided by extending one of the stairways down to sub-basement level, some way of emergency exit to outside the building such as a Class C stairway to the alley.

Street Floor

Exit doors must be provided for the rated capacity of the street floor, figured at one person per 30 sq. ft. gross floor area and one door exit unit per 100 persons, plus the exit travel from other floors which must pass through the street floor.

Outside exit doors to serve the street floor will require 15 units. (45,000 ÷ 30 ÷ 100)

Outside exit doors to serve required stairs from upper floors discharging through the street floor will require 1½ units of door per 2-unit stair (difference due to faster travel through doors). There are three 2-unit stairs from upper floors discharging through the street floor, so 4½ door exit units will be required for this purpose.

Outside exit doors are similarly required to serve basement stairs and escalators discharging through the street floor area. There are 12½ units of basement stairs to the street floor, therefore 9½ units of street exit door width will be required for basement stairs, the fraction ⅜ being treated as ½, as exit units are not rated in fractions less than ½.

Total street floor doors will thus be

To serve street floor area	15 units
To serve upper floor stairs	4½ units
To serve basement stairs	9½ units
Total	29 units

Assuming that there are four revolving doors rated at ½ unit each, there must be 27 units of swinging door width. This may be provided by twelve 40 in. doors and two 34 in. doors or any other desired combination. Doors must be so located as to provide an exit within 150 ft. travel distance of any point, and at least one swinging door must be within 20 ft. of each revolving door.

Reduction of Exits

The exit facilities in the above example may be reduced, in full compliance with the Building Exits Code, by taking advantage of various permitted alternatives as follows, but in any case, exits must be sufficient to comply with the requirement for not more than 150 ft. travel distance to an exit.

If the building is subdivided by a fire wall throughout all stories, with openings in the wall protected by fire doors so arranged as to qualify as horizontal exits in accordance with Section 39, the store may be considered for exit purposes as two separate buildings, with half of the required exits for each consisting of horizontal exits leading through the fire wall. Thus the total required exits may be reduced by 50%.

If all the required stairs from upper floors can be arranged to discharge directly to the outside of the building, instead of partly through the street floor area, the street floor doors may be reduced accordingly, in the above example reducing street floor door requirements by 4½ units.

If the basement is of such shape and arrangement that all parts lie within a 150 ft. travel distance of doors to the alley, the entire basement exit requirements may be satisfied by providing additional doors to the alley, thus further reducing required street floor exit doors by 9½ units. However, the alley must be of sufficient width to accommodate the discharge from all the exits, as per par. 3141.

Exit Details

2531. All exit facilities required to comply with the provisions of pars. 2511–2527 shall be in accordance with Chapter III, provided, however, only types of exits specified in pars. 2511–2527 may be used as required exit facilities in any mercantile occupancy.

This prohibits as required exits, fire escapes for new buildings, slide escapes for any mercantile occupancy, new or existing, and any other exit facility not in accordance with the applicable provisions of the Building Exits Code.

2532. The minimum clear width of any aisle leading to exterior exit doors shall be 5 ft. and the total width of aisles running parallel in either direction shall be at least as great as the required width of exit doors toward which the aisles lead.

For further details, see Section 31.

2533. In buildings with automatic sprinkler protection in accordance with Section 46, one half of rated number of exit units of stairways, escalators or ramps serving as required exits, from floors above or below the street floor may discharge

through the main street floor area instead of direct to the street, or through a fire resistive passage to the street, provided that:

(*a*) Not more than one half of the required exit units from any single floor considered separately discharge through the street floor area.

(*b*) The exits are enclosed in accordance with Section 43 to the street floor.

(*c*) The distance of travel from the termination of the enclosure to an outside street door is not more than 50 ft.

(*d*) The street floor doors provide sufficient units of exit width to serve exits discharging through the street floor in addition to the street floor itself, as per par. 2521.

(*e*) The maximum travel distance requirements of pars. 2511 and 3024 are complied with (distance from termination of enclosure to street door is added to the travel distance to reach an exit).

The basis for the above exception to the general rule on complete enclosure of exits up to their point of discharge to the outside of the building, is that with the specified safeguards, reasonable safety is maintained.

A stairway is not considered to discharge through the street floor area if it leads to the street through a fire resistive enclosure separating it from the main area, even though there are doors between the first floor stairway landing and the main area.

The provisions of par. 2533 should not be confused with open stairways as permitted by par. 2542.

Protection of Vertical Openings

2541. All stairways, elevator shafts, escalator openings and other vertical openings shall be enclosed or protected in accordance with Section 43 except as otherwise permitted by pars. 2542–44.

Where open stairways or escalators are permitted, they are considered as ways of travel to exits, rather than as exits, and requirements for distance to exits include the travel on stairs. (See par. 3023.)

See par. 2505 for provisions on determining population for exit purposes where vertical openings are unprotected.

2542. Exceptions for Class A stores.

(*a*) In any Class A store, openings may be unprotected between any two floors, such as open stairs or escalators between street floor and basement, or open stairs to second floor or balconies or mezzanines above the street floor level (not both to basement and above unless sprinklered).

(*b*) In any Class A store with automatic sprinklers in accordance with Section 46, openings may be unprotected under the conditions permitted by par. 4302, or between basement and street floor and between street floor and second floor, or if no openings to basement, between street floor, street floor balcony or mezzanine, and second floor, but not more than between three floor levels.

(*c*) In existing Class A stores only, one floor above those otherwise permitted may be open if such floor is not used for sales purposes and the entire building is sprinklered.

2543. Exceptions for Class B stores.

(*a*) In any Class B store, openings may be unprotected between any two floors, such as open stairs or escalators between street floor and basement, or between street floor and mezzanine or second floor (but not to both basement and above unless sprinklered).

(*b*) In any Class B store with automatic sprinklers in accordance with Section 46, openings may be unprotected under the conditions permitted in par. 4302, or between basement and street floor and between street floor and balcony or mezzanine and second floor.

(*c*) In existing Class B stores only, all floors permitted under Class B may have unprotected openings if the entire building is completely sprinklered in accordance with Section 46.

2544. Exceptions for Class C stores.

(*a*) In any Class C store, openings may be unprotected between street floor and balcony.

(*b*) In existing buildings only, openings may be unprotected between street floor and basement or second floor not used for sales purposes.

Signs and Lighting

2551. All mercantile occupancies shall have exit illumination, and signs, where necessary, in accordance with Sections 52 and 53.

2552. Class A stores shall have emergency lighting facilities conforming to Type 1 or Type 2 specifications of Section 52.

2553. Class B stores shall have emergency lighting facilities conforming to Type 1, 2 or 3 specifications of Section 52.

General Features

2560. Interior finish of exits of all stores shall be Class A or Class B, in accordance with Section 44.

2561. In all Class A and Class B stores, interior finish of the ceiling shall be Class A or Class B in accordance with Section 44 unless completely sprinklered in accordance with Section 46, in which case Class C may be used. In all Class A and Class B stores, interior finish of the walls shall be Class A, Class B or Class C in accordance with Section 44.

2562. In Class C stores, interior finish shall be Class A, B or C, in accordance with Section 44.

2563. Air Conditioning, Ventilating, Heating, Cooking and other Service Equipment shall be in accordance with Section 47.

2564. Hazardous areas of mercantile occupancies shall be segregated or protected in accordance with Section 49.

2565. In Class A stores, employees shall be regularly trained in fire exit drill procedures, in general conformance with Section 51.

2566. All features not otherwise specified shall be in accordance with the general principles of Section 10.

Special Provisions for Self Service Stores

2571. In self service stores, no check out stand or associated railings or barriers shall obstruct exits or required aisles or approaches thereto.

See pars. 3261 *et seq.* for provisions on turnstiles.

2572. In self service stores where wheeled carts or buggies are used by customers, adequate provision shall be made for the transit and parking of such carts to minimize the possibility that they may obstruct exits.

OPEN AIR MERCANTILE OPERATIONS

2581. Open air mercantile operations, such as open air markets, gasoline filling stations, roadside stands for the sale of farm produce and other outdoor mercantile operations shall be so arranged and conducted as to maintain free and unobstructed ways of travel at all times to permit prompt escape from any point of danger in case of fire or other emergency, but no dead ends in which persons might be trapped due to display stands, adjoining buildings, fences, vehicles or other obstructions.

2582. If mercantile operations are conducted in roofed-over areas, they shall be treated as mercantile buildings, provided that canopies over individual small stands to protect merchandise from the weather shall not be construed to constitute buildings for the purposes of this Code.

COMBINED MERCANTILE AND RESIDENTIAL OCCUPANCIES

2591. No dwelling unit shall have its sole means of exit through any mercantile occupancy in the same building, except in the case of a single family unit where the family operates the store.

2592. No multiple dwelling occupancy shall be located above a mercantile occupancy in a building of combustible construction, unless the dwelling occupancy and exits therefrom are separated from the mercantile occupancy by construction having a fire resistance of at least one hour in existing buildings, or unless the mercantile occupancy is protected by automatic sprinklers in accordance with Section 46, or in the case of existing buildings with not more than two dwelling units above the mercantile occupancy, by an automatic fire alarm system in accordance with Section 45.

SECTION 26. OFFICE OCCUPANCIES

2600. Office occupancies shall include all buildings and structures or parts thereof with occupancy as described in par. 2006.

2601. Office occupancies shall be classified as ordinary hazard in accordance with Section 12.

2602. For purposes of determining required exits, the capacity of office buildings, or parts of buildings used for office purposes, shall be the maximum capacity as determined by the enforcing authority, but not less than one person per 100 sq. ft. gross floor area.

See Section 11 for further details of determination of population and Section 42 for details of measurement of areas.

2603. In cases of mezzanines or balconies open to the floor below, or other unprotected vertical openings between floors as permitted by pars. 2652–53, the population of the mezzanine or other subsidiary floor level shall be added to that of the main floor for the purpose of determining required exits, provided however that in no case shall the total number of exit units be less than would be required if all vertical openings were enclosed.

Number and Location of Exits

2611. Not less than two exits shall be provided for every floor, including basements occupied for office purposes or uses incidental thereto, except as one exit is permitted by par. 2614.

2612. Exits shall be as remote from each other as practicable, so arranged that it will not be necessary to travel more than 150 ft. from any point in the building to reach the nearest exit, or 225 ft. in a building protected by a complete automatic sprinkler system in accordance with Section 46.

See Section 30 for details of method of measurement including measurement from office doors, par. 3022.

2613. From every point there shall be at least two separate exits accessible (except as provided by par. 2614) so arranged as to be reached by different paths of travel in different directions except that a common path of travel may be permitted for the first 100 ft. from any point, as in the case of an individual office with a single door to a corridor which gives access to separate exits in different directions. No corridor shall have any dead

end extending more than 50 ft. beyond the point where exits are accessible in different directions.

Unless exits are suitably located, this requirement may interfere with the practice in multiple tenant office buildings of renting a wing or large section to a single tenant who closes the corridor with a door subject to locking and treats the corridor inside the door as part of his general office space. No required exit may be blocked by a door subject to locking against the exit travel.

2614. (a) For rooms or areas with a total capacity of less than 100 persons, having direct exit to the street or to an open area outside the building at grade level, with a total travel distance from any point of not over 100 ft., a single exit may be permitted. Such travel shall be on the same floor level, or if the traversing of stairs is required, these shall not be more than 15 ft. in height, and such stairs shall be provided with complete enclosures to separate them from any other part of the building, with no door openings therein.

(b) Any three-story office building of fire-resistive construction, not to exceed 3,000 sq. ft. gross floor area per floor may be permitted with a single stairway to the third floor, if the total travel distance to the outside of the building does not exceed 100 ft., if such stairway does not provide any communication with the basement or the first or second floors, and if it is fully enclosed or is an outside stairway.

2615. All required exits shall be in accordance with the applicable sections of Chapter III, with access thereto and ways of travel therefrom in accordance with Section 31.

2616. The minimum width of any corridor or passageway serving as a required exit or means of travel to or from a required exit shall be 44 in. in the clear.

2617. In buildings completely protected by automatic sprinklers in accordance with Section 46, one half of required exits from floors above or below the street may discharge through the open street floor area under the same conditions as permitted for mercantile occupancies, par. 2533.

Street Floor Exits

2621. Street floor exits, arranged as required by pars. 2611–14, shall be sufficient to provide the following numbers of units of exit width:

(a) One unit for each 100 persons capacity of the street floor (10,000 sq. ft. gross area), plus

(*b*) One and one half units for each two units of stairway, ramp or escalator from upper floors discharging through the street floor, plus

(*c*) One and one half units for each two units of stairway, ramp or escalator from basement discharging through the street floor.

2622. Street floor exits shall consist of doors in accordance with Section 32, revolving doors in accordance with Section 32, and subject to the limitations therein specified, or horizontal exits in accordance with Section 39 or any combination thereof. If owing to differences in grade, any street floor exits are at points above or below the street or grade level, such exits shall comply with the provisions for exits from upper floors or basements.

Upper Floor Exits

2631. Each floor level above the street shall have exits, arranged in accordance with pars. 2611–14, sufficient to provide for the capacity of that floor using exits in accordance with the provisions of Chapter III and subject to the limitations thereof, as follows:

Class A or Class B Stairs, Outside Stairs or Smokeproof Towers, in accordance with Section 33, one unit for 60 persons

Ramps, in accordance with Section 34
Class A, one unit for 100 persons
Class B, one unit for 60 persons

Escalators, in accordance with Section 37
One unit for 60 persons

Horizontal Exits in accordance with Section 39
One unit for 100 persons, but nor more than 50 per cent of exit capacity

For existing buildings only:
Stairs, Class C in accordance with Section 33, one unit for 60 persons

Fire Escape Stairs in accordance with Section 35 one unit for 60 persons

Ramps, Class C, in accordance with Section 34 one unit for 60 persons

2632. Where stairways, escalators, outside stairs, ramps or fire escapes serve two or more upper floors, the same stairway or other exit required to serve any one upper floor may also serve other upper floors, except that no inside open stairway, escalator or ramp may serve as a required egress facility from more than one floor.

Under this paragraph, if the second and third floor of a store building were each required to have three stairways, the second floor may use the stairways serving the third floor so that the total number of stairways required is three, not six.

If vertical openings between the first and second floor are unprotected, with open stairs providing the path of travel from the second floor to reach exits, the required stairs from the third floor must be separate, continuously enclosed down to the street floor.

2633. No slide escapes, elevators or other types of egress facility not specified in par. 2631 shall be used to provide required exits from any office occupancy.

Basement Exits

2641. Any floor level below the street occupied for office use or purposes incidental thereto shall have exits, arranged in accordance with pars. 2611–14, sufficient to provide for the capacity of the floor, using exits in accordance with the provisions of Chapter III and subject to the limitations thereof, as follows:

Doors leading outside the building at grade, in accordance with Section 32.

One Unit for 100 persons

Stairs, Outside Stairs or Smokeproof Towers in accordance with Section 33.

Class A or B, one unit for 60 persons

In existing buildings only, Class C, one unit per 60 persons

Ramps in accordance with Section 34

Class A, one unit for 100 persons

Class B, one unit for 60 persons

In existing buildings only, Class C, one unit for 60 persons

2642. Where two or more basement levels are occupied for office use, the same stairways, escalators or ramps may serve each, except that no inside open stairway, escalator or ramp may serve as a required egress facility from more than one floor level.

2643. Basements used only for storage, heating and other service equipment, and not subject to office occupancy, shall have exits in accordance with Section 28.

Protection of Vertical Openings

2651. All stairways, elevator shafts, escalator openings and other vertical openings shall be enclosed or protected in accordance with Section 43 except as otherwise permitted by pars. 2652–53.

Where open stairways or escalators are permitted, they are considered as ways of travel to exits, rather than as exits, and requirements for distance to exits include the travel on stairs (See par. 3023).

2652. Unprotected vertical openings connecting not more than three floors used for office occupancy only may be permitted in accordance with the conditions of par. 4302, but without automatic sprinkler protection if the building is of fire-resistive construction and all interior finish is Class A as per Section 44; otherwise automatic sprinkler protection is required.

2653. In existing buildings only, where provided with complete automatic sprinkler protection in accordance with Section 46, vertical openings may be unprotected if no unprotected vertical opening serves as any part of any required exit facility, and all required exits consist of smokeproof towers in accordance with Section 33, fire escape stairs in accordance with Section 35 or horizontal exits in accordance with Section 39.

2654. Basements used for storage or other than office occupancy shall have no unprotected openings to office occupancy floors.

Interior Finish

2655. Interior finish of exits, and of enclosed corridors furnishing access thereto, or ways of travel therefrom shall be Class A or Class B in accordance with Section 44, or Class C if sprinklered in accordance with Section 46.

2656. In general office areas, Class A, Class B or Class C interior finish shall be provided in accordance with Section 44.

Signs and Lighting

2661. Signs designating exits or ways of travel thereto shall be provided in accordance with Section 53.

2662. Exit lighting shall be provided in accordance with Section 52.

2663. In any office building subject to occupancy by 1,000 or more persons, emergency lighting of Type 1, 2 or 3 shall be provided in accordance with Section 52.

Alarms and Drills

2671. In any building not provided with automatic fire alarm facilities in accordance with Section 45, or automatic sprinklers in accordance with Section 46, a manual fire alarm system shall be provided in accordance with Section 45 if the total capacity of the building is over 1,000 persons, or if more than 200 persons are employed above or below the street level.

2672. In any building subject to occupancy by more than 500 persons or more than 100 above or below the street level, employees and supervisory personnel shall be instructed in fire exit drill procedures in accordance with Section 51 and shall hold practice drills periodically where practicable.

COMBINED OFFICE AND MERCANTILE OCCUPANCY

2681. In any building occupied both for office and mercantile purposes, the entire building shall have exits in accordance with Section 25, unless mercantile occupancy sections are effectively segregated from office occupancy sections in which case exit facilities may be treated separately.

SECTION 27. INDUSTRIAL OCCUPANCIES

2701. Industrial occupancies shall include those described in par. 2007, and shall be subdivided for the purposes of this Code into the following groups:

A. **General Industrial Occupancy.** Includes all manufacturing operations except high hazard conducted in buildings of conventional design suitable for various types of manufacturing, such as multi-story buildings where floors are rented to different tenants, or buildings suitable for such occupancy and therefore subject to possible use for types of manufacturing with a high density of employee population such as in garment factories.

B. **Special Purpose Industrial Occupancy.** Includes all buildings except high hazard occupancy, designed for and suitable only for particular types of operations, characterized by a relatively low density of employee population with much of the area occupied by machinery or equipment.

C. **High Hazard Industrial Occupancy.** Includes industrial operations of either of the above general classifications, but so handling or processing hazardous materials as to constitute a high hazard occupancy as defined in Section 12.

D. **Open Industrial Structures.** Includes operations conducted in the open air as distinguished from enclosure within buildings, such as often found in oil refining and chemical processing plants where equipment is in the open with platforms used for necessary access, sometimes with roofs or canopies to provide some shelter, but no walls.

2702. The capacity of industrial occupancies for which exits are to be provided shall be determined in accordance with Section 11 (one person per 100 sq. ft. gross floor area) provided that in Special Purpose Industrial Occupancy and for Open Structures, the capacity shall be the maximum number of persons to occupy the area under any probable conditions, and further provided that in existing industrial occupancies, the enforcing authority may waive requirements for additional exits if the existing exits are adequate for the maximum number of persons actually employed.

In most cases the requirements for maximum travel distance to exits will be the determining factor rather than numbers of occupants, as exits provided to satisfy travel distance requirements will be sufficient to provide exit capacity for all occupants, except cases of unusual arrangement of buildings or high density of population of a general manufacturing occupancy.

A. GENERAL INDUSTRIAL OCCUPANCY

2711. Not less than two exits shall be provided for every floor or section, including basements used for industrial purposes or uses incidental thereto, except as a single exit as permitted by par. 2715.

2712. Exits shall be as remote from each other as practicable, so arranged that it will not be necessary to travel more than 100 ft. from any point to reach the nearest exit, or 150 ft. in a building protected by a complete automatic sprinkler system in accordance with Section 46, except as otherwise permitted by par. 2713.

See Section 30 for details of method of measurement.

2713. In buildings used for aircraft assembly or other occupancies requiring undivided floor areas so large that the distances from points within the area to the nearest outside walls where exit doors could be provided are in excess of 150 ft., requirements for distance to exits may be satisfied by providing stairs leading to exit tunnels or to overhead passageways in accordance with pars. 3150 *et seq.* In cases where such arrangements are not practicable the enforcing authority may, by special ruling, permit other exit arrangements for one story buildings with distances in excess of the maximum distances specified in par. 2712 if complete automatic sprinkler protection is provided and if the height of ceilings, ceiling curtain boards and roof ventilation are such as to minimize the possibility that employees will be overtaken by the spread of fire or smoke within 6 ft. of the floor level before they have time to reach exits, provided, however, that in no case may the distance of travel to reach the nearest exit exceed 400 ft. Where smoke venting is required as a condition for permitting distances of travel to exits in excess of the maximum otherwise allowed, the smoke venting arrangement shall be in accordance with pars. 4721 *et seq.*

2714. From every point there shall be at least two separate exits accessible (except as provided by par. 2715), so arranged as to be reached by different paths of travel in different directions except that a common path of travel may be permitted for the first 50 ft. from any point, *i.e.*, no dead end may be more than 50 ft. deep.

Unless exits are suitably located, this requirement may interfere with the practice in multiple tenant manufacturing buildings of renting a wing or large section to a single tenant who closes the corridor with a door subject to locking and treats the corridor inside the door as part of his manufacturing space. No required exit may be blocked by a door subject to locking against the exit travel.

2715. For rooms or areas with a total capacity of less than 25 persons having direct exit to the street or to an open area outside the building at grade level, with a total travel distance from any point of not over 50 ft., a single exit may be permitted. Such travel shall be on the same floor level, or if the traversing of stairs is required, there shall not be a vertical travel of more than 15 ft., and such stairs shall be provided with complete enclosures to separate them from any other part of the building, with no door openings therein.

2716. All required exits shall be in accordance with the applicable sections of Chapter III, with access thereto and ways of travel therefrom in accordance with Section 31. The minimum width of any corridor or passageway serving as a required exit or means of travel to or from a required exit shall be 44 in. in the clear.

Greater corridor widths are required wherever necessary to accommodate the travel through the number of units of exit width served thereby and under special conditions as elsewhere specified.

2717. In buildings completely protected by automatic sprinklers in accordance with Section 46, one half of required exits from floors above or below the street may discharge through the open street floor area under the same conditions as permitted for mercantile occupancies, par. 2533.

Street Floor Exits

2721. Street floor exits, arranged as required by pars. 2711–15, shall be sufficient to provide the following numbers of units of exit width:

(*a*) One unit for each 100 persons capacity of the street floor (10,000 sq. ft. gross area), plus

(*b*) One and one half units for each two units of stairway, ramp or escalator from upper floors discharging through the street floor, plus

(*c*) One and one half units for each two units of stairway, ramp or escalator from basement discharging through the street floor.

2722. Street floor exits shall consist of doors in accordance with Section 32, revolving doors in accordance with Section 32 and subject to the limitations therein specified, or horizontal exits in accordance with Section 39 or any combination thereof. If owing to differences in grade, any street floor exits are at points above or below the street or grade level, such exits shall comply with the provisions for exits from upper floors or basements.

Upper Floor Exits

2731. Each floor level above the street shall have exits arranged in accordance with pars. 2711–15, sufficient to provide for the capacity of that floor using exits in accordance with the provisions of Chapter III and subject to the limitations thereof, as follows:

Class A or Class B Stairs, Outside Stairs or Smokeproof Towers, in accordance with Section 33

One unit for 60 persons

Ramps, in accordance with Section 34

Class A, one unit for 100 persons

Class B, one unit for 60 persons

Escalators, in accordance with Section 37

One unit for 60 persons

Horizontal Exits in accordance with Section 39

One unit for 100 persons, but not more than 50 per cent of exit capacity

For existing buildings only

Stairs, Class C in accordance with Section 33, one unit for 60 persons

Fire Escape Stairs in accordance with Section 35, one unit for 60 persons

Ramps, Class C, in accordance with Section 34, one unit for 60 persons

2732. Where stairways, escalators, outside stairs, ramps or fire escapes serve two or more upper floors, the same stairway or other exit required to serve any one upper floor may also serve other upper floors, except that no inside open stairway, escalator or ramp may serve as a required egress facility from more than one floor.

Under this paragraph, if the second and third floor of a store building were each required to have three stairways, the second floor may use the stairways serving the third floor so that the total number of stairways required is three, not six.

If vertical openings between the first and second floor are unprotected, with open stairs providing the path of travel from the second floor to reach exits, the required stairs from the third floor must be separate, continuously enclosed down to the street floor.

2733. No slide escapes or other types of egress facility not specified in par. 2731 shall be used to provide required exits from any ordinary hazard industrial occupancy.

Basement Exits

2741. Any floor level below the street occupied for industrial use or purposes incidental thereto shall have exits, arranged in accordance with pars. 2711–15, sufficient to provide for the capacity of the floor, using exits in accordance with the provisions of Chapter III and subject to the limitations thereof, as follows:

Doors leading outside the building at grade, in accordance with Section 32
One unit for 100 persons

Stairs, Outside Stairs or Smokeproof Towers in accordance with Section 33
Class A or B, one unit for 60 persons
In existing buildings only, Class C, one unit per 60 persons

Ramps in accordance with Section 34
Class A, one unit for 100 persons
Class B, one unit for 60 persons
In existing buildings only, Class C, one unit for 60 persons

2742. Where two or more basement levels are occupied for industrial use, the same stairways, escalators or ramps may serve each, except that no inside open stairway, escalator or ramp may serve as a required egress facility from more than one floor level.

2743. Basements used only for storage, heating and other service equipment, and not subject to industrial occupancy, shall have exits in accordance with Section 28.

Protection of Vertical Openings

2751. All stairways, elevator shafts, escalator openings and other vertical openings shall be enclosed or protected in accordance with Section 43 except as otherwise permitted by pars. 2652–53.

Where open stairways or escalators are permitted, they are considered as ways of travel to exits, rather than as exits, and requirements for distance to exits include the travel on stairs (See par. 3023).

2752. Unprotected vertical openings connecting not more than three floor levels used for industrial occupancy only may be permitted in accordance with the conditions of par. 4302, with automatic sprinkler protection.

2753. In existing buildings only, where provided with complete automatic sprinkler protection in accordance with Section 46, vertical openings may be unprotected if no unprotected vertical opening serves as any part of any required exit facility, and all required exits consist of smokeproof towers in accordance with

Section 32, fire escape stairs in accordance with Section 35 or horizontal exits in accordance with Section 39.

Signs, Lighting, Alarms and Drills

2761. Signs designating exits or ways of travel thereto shall be provided in accordance with Section 53.

2762. Exit lighting shall be provided in accordance with Section 52.

2763. In any building not provided with automatic fire alarm facilities in accordance with Section 45, or automatic sprinklers in accordance with Section 46, a manual fire alarm system shall be provided in accordance with Section 45 if the total capacity of the building is over 500 persons, or if more than 25 persons are employed above or below the street level, except that no manual fire alarm system shall be required in one story buildings where the entire area is undivided and all parts thereof are clearly visible to all occupants.

2764. In any building subject to occupancy by more than 500 persons or more than 100 persons above or below the street level, employees and supervisory personnel shall be instructed in fire exit drill procedures in accordance with Section 51 and shall hold practice drills periodically where practicable.

B. SPECIAL PURPOSE INDUSTRIAL OCCUPANCY

2771. Special purpose industrial occupancies, as defined in par. 2701, shall have exits and other features in accordance with the provisions for general industrial occupancy, except as modified by the following paragraphs:

2772. Exits need be provided only for the persons actually employed; spaces not subject to human occupancy because of the presence of machinery or equipment may be excluded from consideration.

2773. Where unprotected vertical openings are necessary to manufacturing operations they may be permitted beyond the limits specified for General Industrial Occupancy, provided that every floor level has direct access to one or more enclosed stairways or other exits protected against obstruction by any fire in the open areas connected by the unprotected vertical openings or smoke therefrom.

C. HIGH HAZARD INDUSTRIAL OCCUPANCY

2781. High hazard industrial occupancy as defined in par. 2701 shall comply with the provisions for General Industrial Occupancy, except as modified by the following paragraphs.

2782. Exits shall be so located that it will not be necessary to travel more than 75 ft. from any point to reach the nearest exit.

2783. From every point in every floor area there shall be at least two exits accessible in different directions. Where floor areas are divided into rooms, there shall be at least two ways of escape from every room, however small, except for toilet rooms so located that the points of access thereto are out of or suitably shielded from areas of high hazard.

2784. In addition to types of exits for upper floors specified for General Industrial Occupancy, slide escapes in accordance with Section 36 may be used as required exits for both new and existing buildings.

2785. All vertical openings in new or existing buildings of high hazard occupancy shall be enclosed or protected in accordance with Section 43, except that where unprotected openings are necessary to a manufacturing operation they may be permitted by the enforcing authority subject to such restrictions as to occupancy, exits and other features as the enforcing authority may specify to offset the hazard of the unprotected vertical openings.

2786. All high hazard occupancies shall have automatic sprinkler protection or such other protection as may be appropriate to the particular hazard, including explosion venting for any area subject to a dust explosion hazard, designed to minimize danger to occupants in case of fire or other emergency before they have time to utilize exits to escape.

D. OPEN INDUSTRIAL STRUCTURES

2791. Open industrial structures, as defined in par. 2701 shall have exit facilities such as to provide at least one means of escape from any point subject to human occupancy, such means of escape affording reasonable safety from any probable fire or smoke therefrom, explosion or release of fumes, all in general conformity with the general provisions of this Section of the Code insofar as applicable, with due allowance for the increased safety inherent in any open structure where any heat, smoke or fumes will not be confined by walls or roofs.

2792. Where subject to occupancy by more than 10 persons, at least one additional means of escape shall be provided.

SECTION 28. STORAGE OCCUPANCIES

2800. Storage occupancies shall include all occupancies defined in par. 2008.

2801. Storage occupancies shall be classified as ordinary hazard, high hazard or low hazard in accordance with Section 12, depending upon the character of the materials stored, their packaging and other factors.

Section 12 does not recognize low hazard storage occupancy except where the storage structure is noncombustible and the interior finish Class A.

2802. Every building or structure used for storage, and every section thereof considered separately, shall have access to at least one exit so arranged and located as to provide a suitable means of escape for any persons employed therein, and in any room or space exceeding 15,000 sq. ft. gross area, or where more than 10 persons may be normally present, at least two separate means of exit shall be available, as remote from each other as practicable.

2803. Every storage area shall have access to at least one means of exit which can be readily opened, not subject to locking at any time that any persons are therein, and not dependent on any power operated doors except power operated doors complying with par. 3241.

Section 32 prohibits overhead doors on exits.

2804. Every area used for the storage of hazardous commodities shall have an exit within 75 ft. of any point in the area where persons may be present, or 100 ft. where automatic sprinkler protection in accordance with Section 46 is provided, distances to be measured along the natural path of travel.

Section 30 covers details of method of measurement of distances.

SPECIAL PROVISIONS FOR GARAGES

2810. The following provisions apply to parking garages, of closed or open type, above or below ground, but not to mechanical parking facilities where automobiles are moved into and out of storage mechanically which are not normally occupied by persons and thus require no exit facilities. Where repair operations are conducted the exits shall comply with Section 27, Ordinary Hazard Industrial Occupancy, in addition to compliance with the following paragraphs:

The provisions of Section 27 do not accept an open ramp as a required exit except in sprinklered buildings from one floor only.

For further information on Garages, see NFPA Standard No. 88.

2812. Where both parking and repair operations are conducted in the same building, the entire building shall comply with Section 27, unless the parking and repair sections are effectively separated by fire-resistive construction in which the parking and repair section may be treated separately.

2813. Every floor of every closed parking garage shall have access to at least two separate means of exit, so arranged that from any point in the garage the paths of travel to the two means of exit will be in different directions except that a common path of travel may be permitted for the first 50 ft. from any point.

2814. On the street floor at least two separate exit doors shall be provided in accordance with Section 32, except that any opening for the passage of automobiles may serve as a means of exit, provided that no door or shutter is installed thereon. Street floor exits in closed garages shall be so arranged that no point in the area is more than 100 ft. from the nearest exit, or 150 ft. in the case of garages protected by automatic sprinklers in accordance with Section 46, distance being measured along the natural path of travel.

2815. On floors above the street at least two means of exit shall be provided, one of which shall be an enclosed stairway, smokeproof tower or outside stairway in accordance with Section 33, or a horizontal exit in accordance with Section 39, or, in existing garages only, a Class B fire escape in accordance with Section 35. The other means of egress may be a second exit of any of the types permitted by the preceding sentence, or in a ramp type garage with open ramps not subject to closure, the ramp may serve as the second means of exit.

2816. Upper floor exits in closed garages shall be so arranged that no point in the area will be more than 100 ft. (measured along the line of travel) from the nearest exit other than a ramp on the same floor level, or 150 ft. in the case of garages protected by automatic sprinklers in accordance with Section 46.

2817. On floors below the street (either basement or outside underground garages) at least two exits shall be provided, not counting any automobile ramps except that for garages extending only one floor level below the street, a ramp leading direct to the outside may constitute one required means of exit. In garages below street level exits shall be so arranged that no part of the area will be more than 100 ft. (measured along the line of travel) from the nearest stair exit.

2818. If any gasoline pumps are located within any closed parking garage, exits shall be so located that travel away from the gasoline pump in any direction will lead to an exit, with no dead end in which occupants might be trapped by fire or explosion at any gasoline pump. Such exit shall lead to the outside of the building on the same level, or down stairs; no upward travel permitted unless direct outside exits are available from that floor and any floor below (as in the case of a basement garage where the grade is one story or more lower at the rear than at the street).

Gasoline dispensing inside buildings presents inherent hazards that are avoided with outdoor dispensing as in ordinary gasoline filling stations.

NFPA Standards on Garages (No. 88) restrict all indoor automobile fueling facilities, and prohibit them in basements.

2819. Exit signs, in accordance with Section 53, shall be provided for all required exits, or ways of travel to reach exits, except that ramps and doors for automobiles need not have signs.

SPECIAL PROVISIONS FOR AIRCRAFT HANGARS

2821. Exits from aircraft storage or servicing areas shall be provided at intervals of not more than 150 feet on all exterior walls of aircraft hangars. There shall be a minimum of two exits serving each aircraft storage or servicing area. Horizontal exits through interior fire walls shall be provided at intervals of not more than 100 feet. Dwarf or "smash" doors in doors accommodating aircraft may be used to comply with these requirements. All doors designated as exits shall be kept unlocked in the direction of exit travel while area is occupied.

For further information on Aircraft Hangars, see NFPA Standard No. 409.

2822. Exits from mezzanine floors in aircraft storage or servicing areas shall be so arranged that the maximum travel to reach the nearest exit from any point on the mezzanine shall not exceed 75 feet. Such exits shall lead directly to a properly enclosed stairwell discharging directly to the exterior or to a suitably cut-off area or to outside fire escape stairs.

2823. Exit signs shall be provided over doors and exitways in accordance with Section 53.

SPECIAL PROVISIONS FOR GRAIN ELEVATORS

2831. In grain elevators, there shall be at least one stair tower from basement to first floor and from the first floor to the top floor of working house enclosed in a dust-tight noncombustible shaft.

For further information, see NFPA Standard No. 61B, Terminal Grain Elevators. The exit requirements for elevators are based upon the possibility of grain dust explosions.

2832. Noncombustible doors of the self-closing type shall be provided at each floor landing.

2833. An exterior fire escape of the stair or basket ladder type shall be provided from the roof of the work house to ground level or to roof of an adjoining annex with access from all floors above the first.

2834. An exterior fire escape of either the stair or basket ladder type shall be provided from the roof of each storage annex to ground level.

SECTION 29. MISCELLANEOUS OCCUPANCIES

2901. All buildings and structures occupied for purposes not covered by preceding sections of this chapter shall have exits and related safeguards in accordance with the fundamental principles of this code as stated in Section 10, and shall comply with the following provisions where applicable.

TOWERS

2911. Towers occupied for purposes such as observation, signaling, either independent structures or on top of buildings, shall be permitted with a single stairway or ramp exit if all of the following conditions are met:

(*a*) The tower is of such size as not to be subject to occupancy by more than 25 persons on any one floor level.

(*b*) The tower is subject only to occupancy by able-bodied persons and is not used for living or sleeping purposes.

(*c*) The construction is fire-resistive, noncombustible or heavy timber (See Section 41), the interior finish, if any, is Class A or Class B (See Section 44), and there are no combustible materials in, under or in the immediate vicinity of the tower except necessary furniture such as chairs or benches.

The Washington Monument is an example of a tower where it would not be practicable to provide a second stairway and where, if provided, no appreciable increase in safety would be secured.

2912. In towers where there is no occupancy below the top floor level and the conditions of par. 2911 are met, stairs may be open with no enclosure required, or where the structure is entirely open, fire-escape type stairs (See Section 35) may be used.

2913. Stairs or fire-escape type stairs shall be Class B for new construction; Class C for existing towers.

2914. Towers such as forest fire observation towers and railroad signal towers designed for occupancy only by not more than 3 persons employed therein may be of any type of construction, and may be served by ladders conforming to the specifications for Class D Fire Escape Ladders, pars. 3560–68 instead of stairs, provided, however, that if used for living or sleeping purposes they shall at least comply with exit requirements for private dwellings, pars. 2490–2497.

PIERS AND WATER-SURROUNDED STRUCTURES

2921. Piers occupied as places of amusement, passenger terminals or used for any purpose other than for the mooring of vessels and handling of cargo shall be provided with means of exit from any structures thereon and to the mainland appropriate to the character of occupancy of the pier in general accordance with the applicable sections of Chapter II.

2922. Any pier, occupied as per par. 2921, extending more than 150 ft. from the shore shall be so arranged as to minimize the possibility that fire in or under the pier may block escape of occupants to shore, by one or more of the following measures:

(*a*) Pier so arranged as to provide two separate ways of travel to shore, as by two well-separated walkways or independent structures.

(*b*) Open, fire-resistive pier deck on noncombustible supports.

(*c*) Pier deck provided with automatic sprinkler protection for combustible substructure, and for superstructure, if any.

(*d*) Any completely open and unobstructed pier 50 ft. or more in width if less than 500 ft. long, and with width not less than 10 per cent of the length if over 500 ft. long.

(*e*) Any other arrangement providing equivalent safety, as approved by the enforcing authority.

For further information on pier fire protection, see NFPA Standard No. 87, Piers and Wharves.

2923. Any building or structure surrounded by water, such as a lighthouse or "Texas tower," shall have sufficient outside area of ground, as on an island or fire-resistive platform, to provide an adequate area of refuge from any fire in the structure. Means shall be available for transportation of occupants away from such structures to the mainland or other places of safety, such as by boat or helicopter, in case of fire or other emergency, within a reasonable period of time.

VEHICLES AND VESSELS

2931. Any house trailer or similar vehicle, railroad car, street car, truck or bus from which the wheels have been removed, a permanent-type foundation provided or otherwise fixed so that it is not mobile shall be considered as a building and shall be subject to the requirements of this Code which are applicable to buildings of similar occupancy.

Exits and other fire safety standards for trailers will be found in NFPA Standard No. 501, Trailer Coaches and Trailer Courts.

2932. Any ship, barge or other vessel which is permanently moored or aground and is occupied for purposes other than navigation shall be subject to the requirements of this Code applicable to buildings of similar occupancy.

EMERGENCY SHELTERS

2941. Emergency shelters designed to provide refuge in case of air attack, atomic bombing, tornado or other emergency, shall be of noncombustible construction and shall have interior finish of Class A as described in Section 44.

2942. Emergency shelters designed for occupancy by more than 10 persons shall have at least two separate means of exit leading in different directions.

2943. Emergency shelters shall be provided with Type 1 emergency lighting in accordance with Section 52.

Chapter III

EXIT DETAILS

SECTION 30. EXITS AND EXIT MEASUREMENTS

3001. An exit, as referred to in this Code, shall be a way of departure from the interior of a building or structure to the open air outside at the ground level. It may comprise vertical and horizontal means of travel such as doorways, stairways, escalators, ramps, corridors, passageways and fire escapes, including all elements necessary for the purpose of emergency escape from the building or structure. An exit begins at any doorway or other point of access to an exit from which occupants may proceed to the exterior of the building or structure with reasonable safety.

In case of a stairway, the exit includes the door to the stairway enclosure, stairs and landings inside the enclosure, the door from the stairway enclosure to the street or open air or any passageway and door necessary to provide a path of travel from the stairway enclosure to the street or open air. In case of a door leading directly from the street floor to the street or open air the exit comprises only the doorway.

Doors of small individual rooms, as in hotels, while constituting means of escape from the room, are not referred to as exits except when they lead directly to the outside of the building or other place of safety, but in a large room, such as a school auditorium, the doors constitute an integral part of the exit system and are referred to as exits from the room. An interior aisle, corridor or hallway used to reach a stair or door exit is not an exit except where it is so located, arranged and enclosed as to constitute an integral part of a system of travel as described in the preceding paragraph.

3002. A single exit, as referred to in this Code, shall be one separate path of travel to the outside of the building at ground level.

Two doorways which are remote from each other and which provide separate paths of escape constitute two exits, but if the doorways are adjacent and lead to a common passageway or stairway to the outside of the building they constitute a single exit.

3003. All exits required by this Code shall be of standard types, constructed as an integral part of the building or structure served, or permanently affixed thereto.

Portable ladders, rope fire escapes and similar emergency escape devices may have a useful function in facilitating escape from burning buildings lacking adequate exits of the stair or other standard type, but they are not the equivalent of standard exits and their use is not in any way recognized by this Code. Such devices may give a false sense of security and be made an excuse for not providing standard exit facilities. Furthermore, many such portable devices are of types quite unsuited to use by aged or infirm persons or by small children.

Units of Exit Width

3011. The width of exits as required elsewhere in this Code shall be measured in units representing the space necessary for the free passage of one file of persons. One unit of exit width shall be 22 in., subject to minor deductions in certain cases as hereinafter specified and in the case of revolving doors and slide escapes to the provisions of Sections 32 and 36. Fractions of a unit of exit width shall not be counted in measuring exits except that 12 in. added to one or more full units shall be counted as one-half a unit, existing sub-standard Class C stairs shall be rated in fractions of units as specified in pars. 3371, 3375 and 3376 and that certain fire escape stairs shall be rated in fractions of units as specified in Section 35.

Measurement of exit width in terms of units representing the width occupied by one person, rather than measurement in feet and inches is an important concept of the Building Exits Code. Measurement in feet may in some cases involve additional expense in building construction without corresponding increase in safety. For example, a 44-in. stairway comfortably accommodates two files of people; adding 4 in. to make a 4-ft. stairway does not increase the capacity of the stairway. However, it has been shown by count of stairway flows that adding 12 in. to a 44-in. stairway does increase the flow of people, in effect permitting an intermediate staggered file.

For ratings of doors of various widths see par. 3212.

3012. Width of exits shall be measured in the clear at their narrowest points, except that railings may project on each side a distance of not to exceed 3½ in. inside the measured width, and that door jambs may project not more than 2 in. for each 22 in. unit.

Handrails, at approximately waist height, do not actually restrict the effective width of exits. Door jambs, while actually restricting the width, due perhaps to psychological factors do not appear to have any significant effect on the utilization of exits. This may be because everyone uses doors and is accustomed to the slight reduction in width of the path of travel at the point of passing through a doorway, and instinctively turns or squeezes through in a way which would not occur in the case of a narrow stairway or passage, where the feeling of restricted space might be conducive to panic under fire conditions.

3013. Where computations of total required exit width based on population or capacity of buildings give fractional results, the next larger integral number of exit units or integral number plus one half, shall be used, except that fractions less than one half may be neglected in cases where such fraction constitutes less than 10 per cent of the total required number of units, provided, however, that the minimum required width of individual exits shall not be reduced.

3014. Rated capacity in rate of travel through level exits such as doors leading directly outside the building at grade shall be 60 persons per minute per unit of exit width, down or up stairs 45 persons per minute per unit of exit width, except in so far as certain modifications of these figures are specified in special cases by subsequent sections of this Chapter.

Distance to Exits

3021. Distance to an exit shall be measured along the natural path of travel: (*a*) to a door opening directly to the street or open air, (*b*) to a door to a stairway enclosure, or (*c*) to a door in a fire wall or otherwise giving access to a place of safety.

The natural path of travel will be influenced by the contents and occupancy of the building. Furniture, fixtures, machinery, or storage may serve to increase the length of travel. It is good practice in building design to recognize this by spacing exits at closer intervals than would be needed for a completely open floor area, thus reducing the hazard of excessive travel distances due to introduction of furniture, fixtures, machinery or storage, and minimizing the danger of violation of the travel-distance requirements of this Code.

3022. Distance to reach exits shall be measured from the most remote point subject to human occupancy in the case of open areas, and from the doors of individual rooms in the case of buildings divided into rooms subject to individual occupancy by not more than 6 persons such as in hotels and office buildings where the path of travel from any point in the room to reach the room door does not exceed 50 ft., except that in the case of assembly occupancy measurement shall be of total travel distance (not distance from door) as provided by par. 2114.

This permits greater total travel distances, including travel to reach the room door plus the travel from the room door to the exit, in the case of buildings divided into rooms. However, the disadvantage of a few seconds greater travel time is offset by the effect of room partitions in delaying the spread of fire and smoke, and minimizing general panic hazard.

3023. In situations where open stairways are permitted, as a path of travel to required exits, such as between mezzanines or balconies and the floor below, the distance shall include the travel on the stairway, and the travel from the end of the stairway to reach an outside door or other exit, in addition to the distance to reach the stairway.

3024. In situations where travel through an open street floor area from a stairway to reach a street door is permitted, the street floor travel distance shall be included as part of the travel to reach the exit, as provided in par. 3131, Exception.

3025. Distances shall be measured along the floor at the center line of the natural path of travel, starting at 1 ft. from the inside wall at the most remote point, curving around any corners or obstructions with a 1 ft. radius from the outermost point of the corner or obstruction, and ending at the inside plane of the wall of the exit, at the center of the doorway or other opening. Where measurement includes stairs, it shall be taken as a straight line in the direction of the pitch of the stairs at the center of outer edge of treads.

This is intended to represent the actual path of travel of a person. The start at 1 ft. from the wall represents the center of a person.

Headroom

3031. All stairways, corridors, passageways and other exit facilities shall be so designed and maintained as to provide adequate headroom.

Minimum headroom specified in other sections of this Code ranges from 10 ft. to 6 ft. 6 in.

SECTION 31. ACCESS, AISLES AND CORRIDORS

3101. All means of access to exits, and aisles and corridors constituting an integral part of exit facilities shall comply with Section 31 and other applicable sections of Chapter III.

3102. Where exit travel is not on the same level, differences in elevations shall be traversed by stairs, ramps or other means in accordance with Chapter III.

3103. In new construction differences in elevation of less than 21 in. in any path of required exit travel shall be traversed by ramps, with the following exceptions:

A single step at an outside exit door as permitted by par. 3354.

One- and two-family private dwellings.

Any path of exit serving 10 or less persons.

Access to Exits

3111. All exits shall be so located and arranged that they are readily accessible.

3112. The arrangement of building, contents and exits shall be such that at least one exit will be accessible from any point in the building within a maximum travel distance as specified in the applicable section of Chapter II, measured in accordance with the provisions of pars. 3021 and 3022.

Most of the sections of Chapter II specify distances of 100 ft. for unsprinklered buildings of ordinary hazard occupancy, 150 ft. for sprinklered buildings. In some low hazard occupancies 150 ft. is permitted under specified conditions without sprinklers. For sparsely occupied storage buildings for low or ordinary hazard storage Section 27 imposes no travel distance requirements.

For special provisions for large area manufacturing buildings see par. 2713.

3113. In no case shall access to an exit be through a bathroom, bedroom or other room subject to locking, except where the exit is required to serve only the bedroom or other room subject to locking, or adjoining rooms constituting part of the same dwelling or apartment used for single family occupancy.

3114. No hangings or draperies shall be placed over exit doors or otherwise so located as to conceal or obscure any exit.

3115. No mirrors shall be placed on exit doors. No mirrors shall be placed in or adjacent to any exit in such a manner as to confuse the direction of exit.

3116. All ways of access to exits shall be clearly distinguished as such.

Doors leading through wall panelling which harmonize in appearance with the rest of the wall so as to avoid detracting from some desired aesthetic or decorative effect are not acceptable, as casual occupants may not be aware of such exits even though actually visible.

3117. In any high hazard manufacturing or other occupancy containing a high hazard, exits shall be so arranged that to reach the nearest exit from any point it will not be necessary to travel toward any point of high hazard, such as a location where gasoline or similar flammable liquid is dispensed or where hazardous chemicals are mixed or heated, unless the path of travel is shielded from the point of hazard by a suitable partition or barrier.

Aisles and Corridors

3121. Where exits are not immediately accessible from an open floor area, safe and continuous passageways, aisles or corridors leading directly to every exit and so arranged as to be conveniently accessible to every occupant, shall be maintained at all times on all floors of all buildings.

3122. Widths of passageways, aisles or corridors shall be measured in the clear, at their narrowest points produced by any projection, radiator, pipe or other object. Doors swinging into passageways shall not restrict the effective width at any point during their swing to less than the minimum widths hereinafter specified.

Any projection, radiator, pipe or other object that extends into a corridor, irrespective of width, is undesirable, particularly where large crowds must be accommodated.

3123. The aggregate width of passageways, aisles or corridors leading to any exit shall be at least equal to the required width of the exit. Where all travel to any exit is along the passageway, such passageway shall have a width at least equal to the required width of the exit; where several passageways lead to an exit each shall have a width suitable for the travel which it may be called on to accommodate.

3124. The minimum width of any passageway, aisle or corridor shall be 30 in. in the clear.

Greater widths are required in most cases by other sections of this Code.

3125. The floors of aisles and corridors shall be substantially level, or if sloping shall comply with the requirements for ramps, Section 34.

3126. The interior finish of corridors required to be enclosed shall be as required for the interior of the stairway or other exit to or from which they lead.

Discharge from Exits

3131. All exits shall lead to the street directly or by way of a yard, court, or fire-resistive passageway having fire resistance at least equivalent to that required by Section 43 for stairways which it serves. The width of any passageway shall be at least equal to the aggregate widths of all the exits discharging through it, except that where two or more stairways discharge through such corridor, the required passage width to serve such stairways may be three-quarters of the combined width of the stairways (plus the width necessary to serve required exit doors opening into the passage). Any passageway requiring a travel of over 100 ft. shall comply with pars. 3150 *et seq.*

The reduction in passage width as compared with stairs is based on the rated flows of 45 persons per min. per unit for stairs, 60 for level travel.

Exception: Where permitted by applicable provisions of Chapter II, stairs or ramps may discharge through an open street floor area protected by automatic sprinklers, instead of through a fire-resistive passageway as specified in the following paragraphs, with the further restriction that in such cases the distance from the discharge point of the stairway or ramp to the outside exit door shall be added to the distance to reach the point of entrance to the stairway or ramp for the purposes of determination of distance of travel to reach exits.

Discharge of stairs through street floor areas is permitted for hotels by par. 2435, for apartment houses by par. 2456, for stores by par. 2533.

3132. Where stairways or other exits discharge through fire-resistive passages such passages shall be not less than 8 ft. in height for new buildings and 7 ft. in height for existing buildings; where the travel distance is over 100 ft., additional requirements apply as per pars. 3150 *et. seq.* Where there is communication between the passage and the street floor all such openings shall be protected by standard fire doors except that in sprinklered fire-resistive buildings approved wired glass windows in fixed metal sash may be permitted in interior walls. In the case of smokeproof towers, passages shall be unpierced.

3134. All stairs and other exits shall be so arranged as to make clear the direction of egress to the street.

This prohibits the extending of stairs to the basement in such a way that persons descending from upper floors might unknowingly continue to the basement, arrangement of exit corridors in such a way that persons may confuse dead-end branch corridors with main exit corridors and other like situations.

Street or Yard Area

3141. All exits shall lead to streets of adequate width to accommodate all persons leaving through the exits, or to yard area of adequate size provided with unrestricted access to the street.

It is important that ample roadways be available from buildings in which there are large numbers of occupants so that exits will not be blocked by persons already outside. Two or more avenues of departure should be available for all but very small places. Location of a large theatre, for example, on a narrow dead-end street may properly be prohibited by the enforcing authority under this rule unless some alternate way of travel to another street is available.

Where exits discharge into yards or open courts there should be no fences, automobile parking or other obstruction to free travel away from the exit. Curbs or other barriers to prevent automobile parking from encroaching on the space needed for fire exit travel may be desirable to facilitate observance of this rule.

EXIT PASSAGEWAYS

3150. Where exit passageways, such as those from stairs to the outside of the building, require a distance of travel to reach the outside of the building of over 100 ft., or 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, the following requirements shall apply.

Note that this does not apply in the case of horizontal exits in accordance with Section 39.

Tunnels

3151. Where tunnels more than 100 ft. long are used as exit passageways such tunnels shall be not less than 8 ft. wide and 8 ft. high in the clear and shall be provided with adequate light and ventilation.

3152. Tunnels shall be reached by stairs or ramps from the main floor above. Such stairs may be open.

3153. Tunnels shall be of at least 2-hour fire-resistive construction with Class A interior finish and shall contain no combustible occupancy, but may serve as a means of access to toilet facilities, and to employees' locker rooms if sprinklered and separated from tunnels by doors normally kept closed.

3154. Tunnels shall discharge to outside the building.

3155. No tunnel serving for required exit purposes shall be such as to require a travel distance of more than 1,000 ft. to reach the outside of the building.

3156. No tunnel shall be accepted as a means of required exit travel unless regularly used for access and egress purposes during normal occupancy, or regularly used during fire exit drills.

3157. Tunnels shall be provided with Type 1 emergency lighting, in accordance with Section 52.

Overhead Passageways

3161. Where overhead passageways are used for required exit purposes, with exit travel up stairs to the passageway and through the passageway to the outside of the building, the vertical distance of travel up stairs shall not exceed 18 ft.

3162. Exit passageways shall be of at least 2-hour fire-resistive construction with Class A interior finish completely separated from the balance of the building, with self closing fire doors or stationary fire windows protecting all openings between passageway and building.

3163. Stairs leading from the main floor level into the overhead passageway shall be enclosed in accordance with Section 43.

3164. Passageways shall be not less than 8 ft. wide and 8 ft. high in the clear.

3165. Passageways shall be adequately lighted and ventilated, with provisions for eliminating any smoke that may enter the passageway in case of fire below. Such provisions may be through permanently open roof vents or other approved means.

EXTERIOR BALCONIES AND ROOF WALKWAYS

3171. Any exterior balcony, porch, gallery or open flat roof space may serve as a required passageway to reach exits if it complies with all requirements as to width, arrangement and materials of construction that are specified for interior corridors or passageways, and complies with the following paragraphs of this sub-section.

3172. Balconies or other open spaces serving as passageways to exits shall have solid floors, substantially level, and shall have balustrades or railings at least equivalent to those specified for Class A or Class B fire escapes.

3173. Balconies or other open spaces serving as passageways in climates subject to snow or ice shall have roofs to protect against the accumulation of snow or ice, unless the balcony serves as the sole normal means of access to the rooms or spaces served, in which case it may be assumed that snow and ice will be regularly removed in the course of normal occupancy.

3174. Balconies or other open spaces shall be maintained as a required path of travel, without obstruction by barriers separating sections of balcony appurtenant to individual rooms or such congestion of porch furniture as to obstruct required minimum widths for exit travel.

3175. Balconies and open roof spaces shall not be considered as exits for the purposes of the requirements of this Code unless safeguarded from fire within the building by fire-resistive construction equivalent to that required for stairway enclosures, with all openings therein protected by standard fire doors or fixed wired glass or, for existing buildings shall comply with the requirement for fire escape balconies, Section 35.

SECTION 32. DOORS

3201. All doors used in connection with exits shall be substantially constructed and installed in a workmanlike manner, and be fitted with reliable hardware.

3202. All doors used in connection with exits shall swing with the exit travel except as doors swinging inward are permitted for individual rooms and apartments, and other small areas as permitted elsewhere in this Code, and except that automatic horizontally sliding fire doors may be used to protect openings in fire walls. (See Section 39, Horizontal Exits.) Vertical sliding doors and rolling shutters shall not be used on required exits. Sliding doors may be used on elevator shaft openings.

Types of doors which are designed to prevent spread of fire through wall openings are not necessarily suitable for use on exits, and some types may involve a personal injury hazard if used on exits.

3203. Doors from individual rooms to corridors or hallways or to the outside of the building shall swing with the exit travel where (*a*) room is used for purpose of assembly, or (*b*) where room is occupied by 50 or more persons, or (*c*) where room contains any hazardous occupancy.

See Section 11 for determination of population; Section 12 for determination of hazard occupancy.

3204. All doors on exits, or providing required means of access to exits, shall be so arranged as to be readily opened from the side from which egress is to be made, at all times when the building, structure or area served is occupied. Locks, if provided, shall not require any key to operate from the inside, except as otherwise permitted by Section 23 for mental and penal institutions.

Where for operating reasons it may be undesirable to allow unrestricted communications through exit doors, alarm devices may be provided which will sound when doors are opened. Control of use of exits may also be facilitated by tell-tale devices which will give indication that doors have been opened. Where circumstances require more rigid control than can be secured by these methods, continuous personal supervision may be necessary, as any mechanical or electrical locking method to prevent improper use of exits is likely to interfere with their availability in any actual fire emergency.

3205. Latches or other releasing devices to open exit doors, or doors in the path of travel to reach exits, shall be of simple types,

the method of operation of which is obvious, even in darkness.

This requirement may be satisfied by the use of conventional types of hardware, whereby the door is released by the turning of a knob or handle, or pushing against a panic bar, but not by unfamiliar methods of operation such as a blow to break glass.

3206. Any devices or alarms installed to restrict the improper use of exits shall be so designed and installed that they cannot, even in case of failure, impede or prevent emergency use of such exits.

3207. All doors designed to be kept normally closed in connection with exits, such as doors on stair enclosures and smoke stop doors, shall be provided with reliable self-closing mechanism, and shall not at any time be secured in the open position except as permitted by par. 3208a and b. All exit doors designed to be kept normally closed shall bear signs reading substantially as follows:

FIRE EXIT
Please keep door closed

3208a. In occupancies where specifically permitted by this Code (stair doors in schools, smoke stop doors in hospitals), doors may be kept normally open for operating convenience, provided that sufficient qualified personnel is continually available to assure prompt closing of doors in case of fire or other emergency, and that the closing of such doors is made a routine part of fire exit drill procedures.

b. Doors in smoke barriers and in stair enclosures, if kept normally open, shall be provided with fusible link holds or equivalent devices and shall also be provided with friction devices of a type that may be readily disengaged, so arranged that the doors will be released by heat or may be readily released manually.

Widths

3211. The unit of width for doorways shall be 22 in. Door jambs shall not project into the required width of doorways by more than 2 in. for each 22-in. unit (20 in. net opening.)

3212. Credit for fractions of units shall not be allowed except that a credit of one-half unit shall be allowed for 12 in. of clear width added to one or more 22-in. unit of width, and except as provided in Section 3252 for revolving doors.

Where doors are subject to two way traffic, a desirable practice is to locate a small wired glass panel in the door in the interest of avoidance of accidents.

Doorway Widths

(Table based on requirements of Pars. 3211–3215)

Doorway Width (Nominal)	Clear Opening	No. Units Exit Width	Stairs Served by Doorway
30″	28″	1	22″
36″	34″	1½	44″
44″	40″	2	56″
	52″	2½	66″
66″	60″	3	88″
	2, 28-in. openings	2	
88″	2, 40-in. openings	4	
	3, 28-in. openings	3	

3213. Where a doorway is divided into two or more separate door openings, each such opening shall be measured separately in computing the number of units of exit width.

Example: A 66-in. doorway, with two separate 30-in. door openings, (6 ins. allowed for stops), would be rated as one unit for each 30-in. opening, or a total of two units for the doorway.

3214. No exit doorway shall be less than 30 in. wide (nominal).

3215. Where a doorway is divided into two or more separate door openings, the minimum clear width of each such opening shall be not less than 28 in.

Floor Levels

3217. The floor on both sides of all required doors shall be substantially level and at the same elevation on both sides of the door, for a distance on each side at least equal to the width of the door, except that where doors lead out of the building the floor level inside may be one step (7½ in.) higher inside than outside, as provided by par. 3354.

PANIC HARDWARE

3221. The exit doors of schools (except doors of individual school rooms as per par. 2223) motion picture theatres and theatres of whatever capacity, shall be equipped with latches (fire exit bolts) which release when pressure of not to exceed 15 pounds is applied to the releasing devices in the direction of the exit travel. Such releasing devices may be bars or panels extending not less than two-thirds of the width of the door and placed at heights suitable for the service required, not less than 30 nor more than 44 in. above the floor.

3222. The exit doors of all other places of public assembly having capacities in excess of 500 persons shall be equipped with latches (fire exit bolts) as provided in the preceding paragraph.

A desirable practice is to have panic bars two-thirds the width of the door, located on the latch side.

Fire Doors and Smoke Stop Doors

3231. Smoke stop doors, where installed to meet the requirements of this Code, shall be of metal, metal covered or approved treated wood construction, with clear wired glass panels, except that in buildings not over two stories in height and not required by other sections of this Code to be of fire-resistive construction, smoke stop doors may be of ordinary solid wood type not less than $1\frac{3}{8}$ in. thick with clear wired glass panels. Such doors shall be of self-closing, double-swing type and may be either single or double. They shall close the opening completely with only such clearance as is reasonably necessary for proper operation.

Smoke stop doors, while not the equivalent of fire doors, and not completely smoke tight, are effective in restricting the spread of smoke and reducing drafts which might otherwise spread fire rapidly.

3232. Fire doors, where installed in accordance with the requirements of this Code shall be of approved types, and shall have a fire resistance appropriate to the wall or partition in which placed.

NFPA Standards for the Protection of Openings in Walls and Partitions (NFPA No. 80) may be consulted for standard practice in the selection and installation of fire doors.

3233. Swinging fire doors and doors in stair enclosure walls designed to prevent the spread of fire shall be provided with approved positive latching means to hold them in the closed position against the pressure of expanding fire gases. Such latching means shall not be required for smoke stop doors or for any other doors not designed to prevent the spread of fire.

Power Operated Doors

3241. Where required doors are operated by power, such as doors with photo-electric actuated mechanism to open the door upon the approach of a person, or doors with power-assisted manual operation, the design shall be such that in event of power failure the door may be manually opened to permit exit travel or closed where necessary to safeguard ways of exit.

Screen and Storm Doors

3245. No screen door or storm door in connection with any required exit shall swing against the direction of exit travel, in any case where doors are required to swing with the exit travel.

There are various methods by which the function of screen or storm doors may be provided without having any door swing against the exit travel. A screen or storm door may be used in the same doorway with an ordinary door by means of a vestibule of sufficient size as to permit the inner door to swing outwardly without interfering with the operation of the door at the other end of the vestibule.

A jalousie door, with a screen or storm sash panel, provides the function of both a regular door and screen or storm sash, all in a single unit.

REVOLVING DOORS AND TURNSTILES

3251. Revolving doors shall not be used on required exits except that approved revolving doors may be used between street floor and street where specifically permitted by Chapter II, but not at foot of stairs from upper floors or at head of basement stairs. Where used, revolving doors shall not constitute more than 50 per cent of the required door width, except as provided in par. 3253.

3252. Each revolving door shall receive credit as constituting one-half unit of exit width. (See par. 3211.) At any location the number of revolving doors constituting required exits shall not exceed the number of units of swinging door width immediately adjoining or within 20 ft., except as provided in par. 3253.

The one-half unit rating here specified is based upon operation of the door in normal revolving position, where only one side is used for travel in one direction, and the rotating leaves of the door may slow the rate of travel to about half of that through an unobstructed door opening of the same width as one leaf of the revolving door. Collapsible revolving doors, while better than fixed leaf doors, are not given any increased rating in units of exit width, because if the setting is such as to prevent accidental collapse of leaves in normal operation their free collapse in case of emergency may be doubtful.

3253. Revolving doors may serve as exits, without adjacent swinging doors, for street floor elevator lobbies if no stairways or doors from other parts of the building discharge through the lobby, and the lobby has no occupancy other than as a means of travel between elevators and street.

Turnstiles

3261. No turnstile or similar device to restrict travel to one direction, or to collect fares or admission charges, shall be so placed as to obstruct any required exit, except that approved turnstiles not over 3 ft. high, which turn freely in the direction of exit travel, may be used in any occupancy where revolving doors are permitted. Turnstiles over 3 ft. high shall be subject to the requirements for revolving doors.

Turnstiles placed in subway or other rapid transit stations, and other places of assembly to prevent the entrance of persons without paying fare or admission fee may be a serious obstruction to rapid egress in case of fire or other emergency, even though such turnstiles are designed to permit persons to leave. Multiple bar turnstiles designed to prevent persons from crawling over, under or around the bars are more objectionable than single bar turnstiles, such as the coin-operated type, but any type of turnstile involves some interference with egress. Where turnstiles are used, required exit facilities may be provided by alternate exits of swinging gate type, with visual supervision by employees to prevent improper use.

3262. Turnstiles in or furnishing access to required exits shall be of such design as to provide 22 in. clear width as the turnstile rotates.

3263. No turnstile shall be placed in any required exit, or barring the way of access thereto or travel therefrom, unless immediately adjacent or within 20 ft. there is a swinging door or gate opening freely in the direction of exit travel, or an open passage serving the same general path of travel as the turnstile.

3264. Turnstiles shall be rated the same as revolving doors as regards units of exit width and rates of travel.

See par. 3252 for rating of revolving doors.

SECTION 33. STAIRS AND SMOKEPROOF TOWERS

3301. All stairs shall be of substantial construction, adequately designed for use as exits.

3302. All stairs serving as required exits or means of access to required exits shall be of permanent, fixed construction; no portable, folding or disappearing stairs permitted, except for fire escapes as per Section 35.

3303. All required stairways and their associated corridors or passageways shall provide a continuous path of exit travel to the outside of the building or structure at grade level. The path of travel may include any approved combination of types of exit facility if each type included is individually acceptable as a required exit, such as an inside stairway extending to a second floor level and thence to the street by an outside stairway, or in the case of an existing building by a fire escape. Where an inside stairway or smokeproof tower leads to the street by way of an outside stairway or fire escape, the outside stairway or fire escape shall provide at least the number of units of exit width as the inside stairway or smokeproof tower and shall provide the same class of exit facility, e.g., a Class B inside stairway will require a Class B outside stair or Class B fire escape stair.

Class A, B and C Stairs

3311. Stairs shall be of Class A, Class B or Class C types, depending upon the requirements of Chapter II of this Code, in accordance with the following table; except in so far as modification of Class C requirements may be permitted under paragraph 3371.

Class A, B and C Stairway Requirements

	Class A	*Class B*	*Class C*
Minimum width clear of all obstructions except handrails which may project not more than 3½ in. each side	44 in.	44 in.; 36 in. where total occupancy of all floors served by stairway is less than 50.	30 in.
Maximum height of risers	7 in.	7¾ in.	8 in.
Minimum width of tread exclusive of nosing or projection	10 in.	9 in.	8 in.
Winders	None	None	Permitted subject to decrease in rated capacity

	Class A	*Class B*	*Class C*
Maximum height between landings	8 ft.	12 ft.	No limit
Minimum dimension of landings in direction of travel	44 in.	44 in.	No limit
Encroachment on required width of landings by swing of doors	None	No door at any point in swing shall reduce width to less than 22 in.	No limit
Minimum number of steps in flight (see par. 3312)	3	3 for new construction	No requirement
Doors opening immediately on stairs, without landing at least width of door	No	No	No requirement
Rated capacity in exit units for min. width standard stairway	2 for 44 in. stair	1½ for 36 in. stair	1 for 30 in. stair, no winders
Rated capacity, person per min. for minimum width standard stairway	90 for 44 in. stair	67 for 36 in. stair	45 for 30 in. stair, no winders

Note on Class A Stairs

Class A stairs are intended for main stairs for places of assembly or elsewhere where large crowds are to be accommodated. Additional desirable provisions beyond those here required include curving the outer corners of landing on a radius of 2 ft., or providing a 45 degree splay 20 ins. wide, and in the case of wide stairs with intermediate handrails, having the approach newel of the intermediate handrail 6 ft. high so that it may be readily seen in a dense crowd, thus avoiding the hazard of persons running against the end of the intermediate handrail.

Note on Class B Stairs

Class B stairs are intended for new construction for buildings of virtually all occupancies not covered by Class A. The Type B Classification is intended also to cover existing stairs in existing buildings where Class A stairs would be specified for new construction. The standard width of Class B stairs is 44 ins. The permission to use stairs 36 ins. wide applies only in cases where the total occupancy is small. The limit of 50 persons is that of the total population of all floors served by the stairway, not merely a proportional part of the number of occupants.

Note on Class C Stairs

Class C stairs are intended to cover existing stairs which although below the standard for new construction (Class B) are acceptable in most existing buildings; also for certain limited applications to roof stairs for new construction. Class C permits conditions in existing stairs which are considerably below the standard for new construction, but are not so hazardous as to justify requiring rebuilding which might in many cases be impossible without practically reconstructing the entire building.

Note on Design

For most convenient use and for minimum hazard of stumbling and falling treads and risers should be so proportioned that the sum of two risers and a tread, exclusive of its projection, is not less than 24 nor more than 25 ins.

3312. The minimum number of steps in any one flight of all Class A stairs shall be three, for new Class B stairs three, with no specified minimum for existing Class B or for Class C stairs. Ramps, instead of steps, shall be used if difference in level is such as to require less than three risers.

Exceptions: Steps in theatre aisles, par. 2135
Steps at outside doorways, par. 3354

Enclosures

3321. All inside stairways shall be enclosed or protected to safeguard the stairway as an exit and to prevent passage of fire or smoke up the stairway opening, in accordance with the provisions of Section 43 of this Code, except in so far as open stairways are specifically permitted by Section 43 or by the provisions of the applicable sections of Chapter II.

3322. All required stairway enclosures in new buildings shall have Class A interior finish if over four stories in height, Class B if of lesser height, in accordance with Section 44 and subject to the modifications specified thereby, except as otherwise required by the provisions of Chapter II for specific occupancies. In no case shall the enclosure of any exit stairway have an interior finish with flame spread rating greater than Class C.

Monumental Stairs

3325. Monumental stairs, such as used in public buildings, are exempted from stairway enclosure requirements if complying with par. 4302.

3326. Monumental stairs, either inside or outside, may be accepted as required exits if all requirements for exit stairs are complied with, including required enclosures and minimum width of treads, except that curved stairs may be accepted with a radius of 25 ft. or more at the inner edges.

A curved stairway as here specified is not essentially different from a straight stairway in respect to safety of exit travel. It should be distinguished from a winding stairway which has a much smaller radius and usually has treads which are very narrow at the inside edge.

Access, Measurement

3331. All requirements of Section 30, Exits and Exit Measurement; Section 31, Access, Aisles and Corridors; and Section 32, Doors, shall be complied with as applicable to stairways.

3332. In buildings of non-fire-resistive construction more than three stories high with roofs having a slope of less than one ft. in four, at least one stairway shall extend through the roof. Where roofs are used for roof gardens or similar occupancies, stairways shall be provided in compliance with requirements for other parts of the building. Class C stairs may be used for access to unoccupied roofs.

3333. Doorways giving access to exit stairways shall provide units of exit width sufficient to permit utilizing the full required capacity of the stairways; where a stairway provides a greater number of units of exit width than required to serve a floor area, door width only sufficient to serve the required stairway width shall be required. Capacity shall be determined in accordance with par. 3014; number of units of door width at rated capacity of 60 persons per minute shall be sufficient to provide for use of required rated capacity of stairs at 45 persons per minute per unit of exit width.

Under this rule, where a 2-unit stairway (44 in.) is required, a 1½ unit door (36 in. nominal) may serve to provide access to the stairs; 1½ unit door capacity, 60 x 1½ = 90 per min.; 2-unit stairway capacity, 45 x 2 = 90 persons per min.

In case of a building with small population where only a 1-unit exit might be required at a given point, a 30 in. (nominal) doorway might provide access to the 44 in. stairway.

3334. Doorways leading out of stairways in the direction of exit travel shall provide units of exit width sufficient to permit the full utilization of the stairways, determined in accordance with par. 3333, with no reduction in width even though the stairway may be wider than necessary to provide required exit capacity.

Stairway Details

(Applying to all types of stairs)

3341. All new stairs (and platforms, landings, etc., used in connection therewith) in buildings four stories or more in height, and in all new buildings, required by this Code to be of fire-resistive construction, shall be of noncombustible construction throughout except that handrails are exempted from this requirement. Treads of stairs and landing floors shall be solid (without perforations).

3342. All stairs, platforms, landings, balconies, and stair hallway floors shall be designed to carry a load of 100 lbs. per sq. ft., or a concentrated load of 300 lbs. so located as to produce maximum stress conditions.

3343. There shall be no variation exceeding 3/16 in. in the width of treads or in heights of risers in any flight, except as permitted by par. 3326 for monumental stairs and for Class C stairs.

3344. All treads less than 10 in. wide shall have a nosing or an effective projection of approximately one inch over the level immediately below, except that Class C Stairs without nosings may be accepted by the enforcing authority.

3345. Where material of stair treads and landings is such as to involve danger of slipping, non-slip material shall be provided on tread surface.

3346. The space beneath any stairway built in whole or in part of combustible material shall be left entirely open or be completely enclosed without door or other opening.

This is to prohibit closets and similar spaces under stairs. It is not to be interpreted to prohibit an enclosed flight of stairs beneath another flight.

3347. No arrangement of treads known as winders shall be permitted in new stairways, except as permitted by par. 3326 for curved monumental stairways.

Winders are permitted only in Class C stairs, existing stairs in existing buildings, and are penalized by reduction in stair capacity rating.

3348. Stairways and intermediate landings shall continue with no decrease in width along the direction of exit travel, except that existing stairs with decrease in width may be accepted, subject to the provision that the narrowest point shall determine the rated width for all floors above that point (or below in the case of basements).

Stairway Doors (See also Section 32)

3351. Doors providing access to descending stairs or means of travel from descending stairs shall be so arranged that the same floor or landing level is maintained on both sides of the door for a distance of at least the width of the door, measured along the line of descending travel, except as otherwise permitted by par. 3354 and for Class C stairs. Where the line of travel involves a change in direction, such as where after entering a door into a stairway enclosure, a right angle turn is made to descend stairs, the measurement shall be made on a curve with a 1 ft. radius from the corner.

This provision is designed to avoid the danger that persons escaping from a fire might fall down stairs if the door into the stairway enclosure opened immediately upon top of a descending flight. It does not require a landing between the top of basement exit stairs and an outside door to

the street, nor inside a door leading to a fire escape where inside steps are provided to ascend from the building floor level to the exit doorway. Such landings are, however, desirable in all cases.

3352. Doors giving access to stairways shall swing in the direction of exit travel. Doors during their swing shall not block stairs or landings and in no case in new buildings shall any door at any point in its swing reduce the effective width of stair or landing to less than 20 in., nor when open interfere with the full use of the stairs.

3353. Doors from stairways to outside the building shall swing out, and be so arranged as not to restrict the effective width of the stairs.

3354. Where necessary to prevent blocking of exit doors by accumulations of snow or ice, or on account of differences in grade level, doors from enclosed stairways to the outside of the building, and doors from the building to an outside balcony of a smokeproof tower or to the landing of an outside stairway may be so arranged that in passing through the door to the outside there is one step down, not to exceed 7¾ in. high.

Railings

3361. All stairs shall have walls or well secured balustrades or guards on both sides and shall have handrails on both sides except that for Class C stairs a handrail on one side only may be accepted. Any stairway 88 in. or more in width shall be provided with one or more intermediate handrails substantially supported; the number and positions of intermediate handrails to be such that there will be not more than 66 in. between adjacent handrails.

3362. Handrails on stairs shall be not less than 30 in. nor more than 42 in. above the upper surface of the tread, measured vertically to the top of the rail, from a point on the tread in line with the face of the riser at its outside edge, except that on stairways designed for use by children an additional handrail may be provided lower than the main handrail.

The optimum height of handrail varies depending upon the steepness of the stairs and the character of occupancy. The most convenient height of rail for persons ascending stairs is lower than for descending. The average optimum height is about 33 in.; 27 in. for schools attended by small children. The maximum height of 42 in. permits the top member of an enclosure, provided to prevent persons from falling from the open edge of stairs, to serve also as the handrail, the same as for fire escape stairs (see par. 3544).

3363. Handrails shall provide a clearance of at least 1½ in. between handrail and wall to which fastened. Handrails shall be of such design and so supported as to withstand a load of 200 pounds applied at any point, downward or horizontally.

Handrails which project not more than 3½ in. from a wall do not reduce the rated effective width of the stairway measured in units as per par. 3012.

The optimum diameter of handrail for use by adults is about 1½ in.

3364. When not enclosed by walls or balustrades, the open edges of stair landings, balconies or platforms appurtenant thereto shall be suitably guarded by extension of the stair rail along the open edge, and the provision of intermediate rails, or other means to protect the space under the rail.

Class C Stairs in Small Buildings

3371. In existing buildings with a total occupancy of all floors served by a stairway of less than 50, the enforcing authority may accept Class C stairs not in accordance with par. 3311, subject to the following reductions in rated exit width.

(*a*) Excessive Pitch

45° to 50°, deduct 40%
50° to 55°, deduct 65%
55° to 60°, deduct 80%

(*b*) Substandard Width of Tread (does not apply if deduction has already been made for substandard pitch).

7 in. to 8 in. (exclusive of nosing or projection) deduct 20%
6 in. to 7 in. (exclusive of nosing or projection) deduct 40%

(*c*) Winders. Where there are winders, measurements of tread, width and pitch shall be taken at one ft. from the narrow end. These reductions apply in addition to those of (*a*) and (*b*).

One winding stair tread, deduct 25%
Each additional stair tread, deduct 1%
(Maximum deduction not to exceed 75%)

(*d*) No stair having an inclination with the horizontal of more than 60° nor a tread (exclusive of nosing or projection) of less than 6 in. shall be permitted in any case.

Examples. Assume a three story, Class C stairway 30 in. wide, 6 in. tread, 9 in. rise, 4 winding treads each flight.

Deductions:
For substandard pitch, 60°, 80%
For substandard tread width . . .
(already covered by pitch deductions)
For winders, 25%+11=36%

Total deduction 80%+36% of 80 or 29%=110%
This stairway accordingly receives no credit whatsoever as an exit

If the stairway had no winding treads, the deduction would be 80% and the rating would be ⅕ of a unit, with a rated flow of 9 persons per minute.

Existing Skew and Curved Stairs

3375. Any existing skew stairway may be accepted as a required Class C stair exit if otherwise complying with the requirements of this Code, provided that its rated units of width shall be reduced by 10 per cent for each 5 degree by which the line of the outer edge of the most skewed tread deviates from a right angle to the center line of the stairs.

3376. Any existing curved stairway with either concave or convex curvature of the outer edge of the treads may be accepted as a required Class C stair exit, if otherwise complying with the requirements of this Code, provided that its rated units of width shall be determined on the basis of the length of a straight line between the centers of the ends of the shortest tread (chord of the arc).

OUTSIDE STAIRS

3381. Any permanently installed stair outside of the building served designed for regular use as an entrance and egress facility in the normal use and occupancy of the building may be accepted as a required exit under the same condition as an inside stair, provided that such stairs comply with all the requirements hereinbefore stated for inside stairs, except as modified by the following paragraphs of this sub-section.

Outside stairs are typified by the main entrance stairs of many public buildings and churches which have their main floor well above the grade level and by stairs to porches or balconies which are the principal entrances of second story dwelling units. Outside stairs are distinguished from fire escapes both by design and character of use. Fire escapes are emergency exit facilities placed on the outside of buildings where stairs provided for normal use are not sufficient to meet exit requirements.

3382. Outside stairs, serving as required exits, shall be not more than one story in height, or so arranged with respect to porches, balconies, roofs or other architectural features as to give the psychological impression of height not in excess of one story, so as to avoid any handicap to the use of the stairs by persons having a fear of high places.

3383. Under all conditions where enclosure of inside stairways is required, outside stairs shall be separated from the interior of the building by fire-resistive walls the same as required for inside stairway enclosures, with fire doors or fixed wired glass windows protecting any openings therein, or in lieu of such separation by fire-resistive walls the stairs shall be at least 15 ft., horizontally, from any opening in the building below the level of the top landing of the stairs.

3384. Outside stairs in climates subject to snow and ice shall be protected by roofs or canopies to prevent accumulation of snow or ice, except in the case of main entrance stairs providing the principal access to a building where it may be assumed that normal use of the building will require removal of snow and ice as a necessary condition for the entrance of occupants.

3385. For outside stairs of monumental type, constructed of stone or concrete, the requirement for a nosing may be waived if treads are at least 11 in. wide.

3386. The requirements for illumination of stairways specified in Section 52 may be satisfied for such outside stairs by street lights or any other exterior illumination normally present which provides the degree of intensity of illumination of the stairway surface specified by Section 52.

3387. Subject to the approval of the enforcing authority, outside stairs may be accepted where leading to roofs of other sections of the building or adjoining building, where the construction is fire-resistive, where there is a continuous and safe means of exit from the roof, and all other reasonable requirements for life safety are maintained.

SMOKEPROOF TOWERS

3391. A smokeproof tower, as herein specified, shall be a continuous fire-resistive enclosure protecting a stairway from fire or smoke in the building served, with communication between the building and the tower by means of balconies directly open to the outer air, so that under no condition will fire or smoke from the building enter the tower, even though doors are blocked open.

The smokeproof tower is recognized as the safest type of exit from upper floors of buildings, and is recommended for general use (except where balconies are subject to exposure by fire in an adjoining hazardous occupancy) though actually required by this Code only under certain special conditions.

3392. Stairs in smokeproof towers shall be of noncombustible construction, and all requirements hereinbefore specified for inside stairs shall apply to stairs in smokeproof towers.

Stair design should be Class A or Class B depending upon the occupancy of the building served.

3393. Stairways shall be completely enclosed by brick or concrete walls or walls of other materials having adequate structural strength and fire resistance to withstand a severe fire. There shall be no openings in walls separating the enclosure from the interior of the building. Fixed or automatic fire windows are permitted in an exterior wall not subject to severe fire exposure hazard from the same or nearby buildings.

3394. Access to the stairway shall be provided from every story through vestibules open to the outside on an exterior wall or from balconies overhanging an exterior wall, but not subject to severe fire exposure hazard. Every such vestibule, balcony or landing shall have an unobstructed length and width not less than the required width of exit doors serving same, and shall be directly open to a street or alley or yard or to an enclosed court open at the top not less than 20 ft. in width and 1000 sq. ft. in area. Balconies or vestibules shall have solid balustrades not less than four ft. high, or shall have railings complying with the requirements for railings of Class A fire escape stair balconies (par. 3542). Wall openings exposing balconies or vestibules shall be protected in accordance with par. 3512.

3395. Access from the building to vestibules or balconies shall be through doorways not less than 40 in. wide for new and 36 in. wide for existing towers. These openings and the entrances to the towers shall be provided with approved, self-closing fire doors

swinging with the exit travel. Clear wired glass not exceeding 720 sq. in. shall be provided in all doors giving access to the enclosure.

3396. The level of the vestibule or balcony floor shall be placed approximately 7½ in. below the floor level of each story where climatic conditions involve the possibility of blocking doors by snow or ice. In mild climates in which this hazard is not presented, the floors shall be approximately level. There shall be no step from the vestibule or balcony into the stair enclosure.

SECTION 34. RAMPS

3401. All ramps used in connection with exits shall be of substantial construction, adequately designed for use as exits.

3402. Corridors or other sloping floor surfaces with a slope of less than 1 in 16 (¾ in. per ft.) shall not be classed as ramps but shall conform to the provisions of Section 31 applicable to corridors.

Class A, B and C Ramps

3411. Ramps shall be of Class A, Class B or Class C types, depending upon the requirements of Chapter II of this Code, in accordance with the following table:

	Class A	*Class B*	*Class C*
Minimum clear width exclusive of handrails which may project not more than 3½ in. each side	44 in.	44 in.	30 in.
Maximum slope	1 in 12 (1 in. per ft.)	1 in 10 (10% or approx. 1 3/16 in. per ft.)	1 in 6 (16⅔% or 2 in. per ft.)
Maximum height between landings	No limit	12 ft.	12 ft.
Handrails	Not required	Both sides plus intermediate rail if ramp is over 88 in. wide	One side if less than 36 in. wide; otherwise same as Class B.
Rated capacity	2 units for 44 in. width	2 units for 44 in. width	1 unit for 30 in. width
Rated discharge rate, persons per minute, per unit width, down	60	45	45
Up	45	45	45

Enclosures

3421. All inside ramps shall be enclosed or protected to safeguard the ramp as an exit and to prevent passage of fire or smoke up the ramp, in accordance with the provisions of Section 43, except in so far as unenclosed vertical openings are permitted by other sections of this Code.

Access, Measurement

3431. All requirements of Section 30, Exits and Exit Measurements; Section 31, Access, Aisles and Corridors; and Section 32, Doors, shall be complied with as applicable to ramps.

3433. Doorways serving exit ramps shall provide units of doorway width at least equal to the number of units of ramp width required to serve the floor or floors from which the ramp leads except that doorways serving Class B or C ramps may have 25 per cent less units of exit width in accordance with similar provisions for stairways as specified in par. 3333.

3434. Doorways leading from ramps in the direction of exit travel shall provide units of exit width sufficient to permit the full utilization of the ramps.

Exit Details

(Applying to all types of ramps)

3441. All new ramps (and platforms, landings, etc., used in connection therewith) in buildings four stories or more in height, and in all new buildings, required by this Code, to be of fire-resistive construction, shall be of noncombustible construction throughout. (Handrails are exempted from this requirement.) Ramp floors shall be solid (without perforations).

3442. All ramps, platforms, landings, balconies, and ramp hallway floors shall be of sufficient strength to sustain safely a live load of not less than 100 lbs. per sq. ft.

3443. There shall be no variation in pitch in any individual ramp surface except that a variation of not to exceed 1% in pitch on opposite sides of the ramp may be permitted where necessary to provide proper adjustment to grade of floors and landings.

3444. Where material of ramp surface is such as to involve danger of slipping, non-slip material shall be provided.

3445. The space beneath any ramp built in whole or in part of combustible material shall be left entirely open or be completely enclosed without door or other opening.

This is to prohibit closets and similar spaces under ramps. It is not to be interpreted to prohibit an enclosed ramp beneath another flight.

3446. All new ramps shall be straight on any individual ramp section; changes in direction, if any, shall be on level landings.

3447. Ramps and intermediate landings shall continue with no decrease in width along the direction of exit travel, except that existing ramps with decrease in width may be accepted, subject to the provision that the narrowest point shall determine the rated width for all floors above that point (or below in the case of basements).

Doors (See also Section 32).

3451. Doors shall not open immediately on a ramp of slope steeper than 1 in 12 (8⅓%), but on a landing at least the width of the door, except on existing Class C ramps.

3452. Doors giving access to ramps shall swing in the direction of exit travel. Doors during their swing shall not block ramps or landings and in no case in new buildings shall any door at any point in its swing reduce the effective width of ramp or landing to less than 22 in., nor when open interfere with the full use of the ramp.

3453. Doors from ramps to outside the building shall swing out, and be so arranged as not to restrict the effective width of the ramp.

Railings

3461. All ramps shall have walls or well secured balustrades or guards on both sides. Ramps with slope steeper than 1 in 12 (8⅓%) shall have handrails on both sides except in Class C ramps. Any Class B or Class C ramp 88 in. or more in width shall be provided with one or more continuous intermediate handrails substantially supported; the number and positions of intermediate handrails to be such that there will be not more than 66 in. between adjacent handrails.

3462. Handrails on ramps shall be not less than 30 in. nor more than 34 in. above the floor surface of the ramp, measured vertically; provided that on existing ramps the enforcing authority may accept other handrail arrangements which he finds safe.

3463. Handrails shall provide a clearance of at least 1½ in. between handrail and wall to which fastened. Handrails shall be of such design and so supported as to withstand a load of 200 pounds applied at any point, downward or horizontally.

Handrails which project not more than 3½ in. from a wall do not reduce the rated effective width of the ramp measured in units as per par. 3012.

3464. Where not enclosed by walls or balustrades, the open edges of landings, balconies or platforms appurtenant to ramps shall be suitably guarded by extension of the ramp rail along the open edge, and the provision of intermediate rails or other means to guard the space under the rail.

SECTION 35. FIRE ESCAPE STAIRS

3501. Fire escape stairs may be used as required means of exit only in existing buildings, subject to the provisions of the occupancy section applying. Fire escape stairs shall not constitute more than 50% of the required exit capacity in any case. Fire escape stairs shall not be accepted as constituting any part of the required exits for new buildings.

Fire escape stairs as specified in this section of the Code should not be confused with outside stairs as covered in Section 33.

Fire escape stairs are regarded as at best only an expedient to remedy deficiencies in the exits of existing buildings where it may not be practicable to provide additional inside stairways, properly enclosed and conforming to all other provisions of this Code. Fire escape stairs, however, may greatly facilitate fire department rescue and fire fighting operations

The fire escape stairs specified by this Code should not be confused with the inferior fire escapes which are commonly found on old buildings. These utterly inadequate, flimsy, precipitous fire escapes, unshielded against fire in the structure to which they are attached, are positively a menace because they give a false sense of security. Such escapes are not recognized by this Code as exits.

Even the superior fire escape stairs constructed in accordance with this Code have limitations which may prevent their effective use in time of fire. Even where window protection is provided conditions may be such that fire (or the smoke from fire) on lower floors may render the stairs impassable before the occupants of upper stories have had time to use them. Fire escape stairs may be blocked by snow, ice or sleet at the time when they are most needed. Persons using fire escape stairs at a considerable height are likely to be timid and to descend the stairs, if at all, at a rate much slower than that which obtains on stairs inside buildings. This applies to some extent even with the solid tread stairs which are specified by this Code in place of the ordinary slatted tread construction. Fire escape stairs are not a usual means of egress. Occupants of buildings will not so readily use them in case of fire as they will use the usual means of exit, the inside stairway. Because they are an emergency device not ordinarily used their proper up-keep may be neglected.

The experiences in many fires, however, shows that properly constructed and maintained fire escape stairs, conforming to the requirements for Class A fire escapes, under favorable conditions provide an effective path of escape from fire.

3502. Fire escape stairs, subject to the limitations of par. 3501 and par. 3511, Table for Class C, shall be treated on the same basis as ordinary inside stairs in calculation of exit capacity.

Types

3503. The following types of fire escape stairs are recognized by this Code:

Return platform type, superimposed runs

Straight run type, with platforms continuing in the same direction.

Either of these may be parallel to or at right angles to the building. They may be attached to buildings or erected independently of them and connected by bridges.

3504. The following types of fire escapes are not recognized by this Code and are not classified as exits.

Ropes, chains or steel tapes, with or without controlled slide devices to facilitate their use

Portable ladders

Slide poles, except in fire stations where regularly used by firemen

Spiral stair escapes, except to the extent recognized for Class C stairs

Ladders, except to the extent recognized for Class C and D fire escapes.

Various types of fire escape devices of the above types may have some value, but not sufficient to justify recognition in the Building Exits Code, nor to consider in any way as a substitute for the types of exit facilities recognized by the Building Exits Code.

3505. Fire escape stairs shall provide a continuous unobstructed safe path of travel to the ground or other safe area of refuge to which they lead. Where the fire escape is not continuous, as in cases where stairs lead to an adjoining roof, which must be crossed before continuing downward travel, the direction of travel shall be clearly indicated, and suitable walkways with handrails shall be provided where necessary. Where a single exit way consists of a combination of inside stairs and fire escape stairs, each shall comply with the applicable provisions of this Code, and the two shall be so arranged and connected as to provide a continuous safe path of travel.

Class A, B and C Fire Escape Stairs

3511. Fire escape stairs shall be of Class A, Class B or Class C types, depending upon the requirements of Chapter II of this Code, in accordance with the following table and subsequent paragraphs.

	Class A	*Class B*	*Class C*
Application (digest of provisions of Chapter II)	New fire escape stairs generally	Existing stairs; new stairs in small buildings	Existing stairs in very small buildings
Minimum widths	44 in. handrails may project not over 3½ in. each side	22 in. clear between rails	18 in. clear between rails
Minimum horizontal dimension any landing or platform	44 in.	22 in.	18 in.
Maximum rise	7¾ in.	9 in.	12 in.
Minimum tread, exclusive of nosing	9½ in.	9 in.	6 in.
Minimum nosing or projection	1 in.	1 in.	No requirement
Tread construction	Solid, ½ in dia. perforations permitted	Solid, ½ in. dia. perforations permitted	Flat metal bars on edge, or square bars secured against turning, spaced 1¼ in. max. on centers
Winders (spiral)	No	No	Permitted subject to capacity penalty
Risers	Solid, or skirt type 1 in. space for drainage	No requirement	No requirement
Maximum height between landings	12 ft.	12 ft.	No requirement
Headroom, minimum	7 ft. 6 in.	7 ft.	6 ft. 6 in.
Enclosure, minimum height	60 in.	42 in.	36 in.
Access to escape	Door or casement windows 30 in. x 6 ft. 6 in. min.	Door or casement windows 24 in. x 6 ft. 6 in. or double hung windows 30 x 36 in. clear opening	Windows
Level of access opening	Level with floor	Not over 12 in. above floor; steps if higher	Same as Class B
Discharge to ground	Permanent stairs continuous to ground	Swinging stair section permitted	Swinging stair, or ladder if approved (par. 3560)

	Class A	*Class B*	*Class C*
Rated capacity, persons per minute	90 for 44 in. stair	45 for 22 in. stair, access by door; 20 if access by climbing over window sill	10 for 18 in. stair; if winders or ladder from bottom balcony, 5; if both, 1
Rated units of exit width, based on rated capacity	1 per 22 in.	1 per 22 in.; ½ per 22 in. if access by climbing over sill	¼ for 18 in. stair; 1/10 if winders or bottom ladder; 1/50 if both

Notes on Class A Fire Escape Stairs

This is the best type, suitable for occupancies such as places of assembly and schools, and the desirable standards for all fire escapes hereafter erected.

Notes on Class B Fire Escape Stairs

This is an intermediate type which may be acceptable for buildings of small or moderate size, but definitely inferior to Class A, particularly where access is by climbing over window sills instead of by doors opening to balconies. Depending upon local conditions, existing Class B fire escape stairs may generally be accepted.

Notes on Class C Fire Escape Stairs

This is the lowest type in any way recognized. It represents the absolute minimum that may be accepted in an existing fire escape stairway. Because of access over window sills, steep pitch and narrow width travel down it will be necessarily slow and may be dangerous. Where there are spiral stair treads, or the stairs terminate at a balcony above ground level with a fixed or moveable ladder from there down, the situation is even worse. The Class C standard is applicable only to existing fire escape stairs, and is suitable only in situations where only a very small number of people are involved.

Arrangement and Protection of Openings

3512. Class A fire escape stairs shall be so arranged that they will be exposed by the smallest possible number of window and door openings. Openings other than those used as a means of exit should preferably have stationary metal frames and wired glass. There shall be no transoms over doors. Every opening, any portion of which is in the limits specified below, shall be completely protected by approved fire doors or metal frame wired glass windows as follows:

(*a*) Horizontally. If within 15 ft. of any balcony, platform, or stairway, constituting a part of the escape proper. This provision does not apply to a platform or walkway leading from the same floor to the escape proper. Protection need not extend around a right angle corner (outside angle 270°) of the building except where stairs are close to such corner.

(*b*) Below. If within three stories or 35 ft. of any balcony, platform, walkway, or stairway constituting a part of the escape proper, or within two stories or 20 ft. of a platform or walkway leading from any story to the escape proper.

(*c*) Above. If within 10 ft. of any balcony, platform, or walkway, as measured vertically, or from any stair treads, as measured vertically from the face of the outside riser.

(*d*) Top story. Protection for wall openings shall not be required where stairs do not lead to the roof.

3513. Where Class A fire escape stairs are located in courts the least dimension of which is less than one third their height, or in alcoves having width less than one third of their height and depth greater than one quarter of their height, all openings below shall be protected.

3514. The provisions of pars. 3512 and 3513 shall also apply to Class B and Class C fire escape stairs unless waived or modified by the enforcing authority in consideration of automatic sprinkler protection, low hazard occupancy or other special conditions.

3515. Fire escape stairs shall extend to the roof in all cases where the roof is subject to occupancy, or is so constructed and arranged as to provide an area of refuge from fire. In all cases where stairs do not extend to the roof access thereto shall be provided by a ladder in accordance with par. 3560, except that such ladders are not required in the case of roofs with pitch steeper than 2 in. to the foot.

3516. Balconies to which access doors lead shall be approximately level with the floor of the building, or in climates where balconies may be subject to accumulation of snow or ice, one step, not to exceed 7¾ in., below the level of the inside floor.

3517. Balconies, to which access is secured through windows with sills above the inside floor level, shall be not more than 18 in. below the sill. For Class B fire escape stairs such balconies shall be not less than 7 in. below the sill; for Class C, level shall not be above the sill.

Access

3521. Access to fire escape stairs shall be provided in accordance with the Table, par. 3511, and the general provisions of Section 31, Access, Aisles and Corridors. Where access is by way of double heavy windows, as permitted for Class B or Class C fire escape stairs, such windows shall be so counterbalanced and maintained

that they can be readily opened with a minimum of physical effort. Insert screens, if any, on any type of opening giving access to fire escape stairs shall be of types that may be readily opened or pushed out. No storm sash shall be used on any window providing access to fire escape stairs.

Access to fire escape balconies by doors, or by casement windows equivalent to doors, with sills at floor level, is the only way in which fire escape stairs can furnish exit facilities in any way equivalent to inside stairs. Where access requires climbing over window sills the exit facility is inherently inferior; such arrangements are suitable only for relatively small numbers of persons in existing buildings where the provision of doors may be impracticable.

Structural Design

3530. All provisions of the Table, par. 3511, shall be complied with, also the following additional and supplementary provisions.

Materials and Strength

3531. Iron, steel, or concrete or other approved noncombustible material, shall be used for the construction of fire escape stairs, balconies, railings, and other features appurtenant thereto.

3532. Balconies and stairs shall be designed to carry a load of 100 lbs. per sq. ft., or a concentrated load of 300 lbs. so located as to produce maximum stress conditions, except as provided in par. 3537 for Class C stairs.

3533. All structural members shall be designed with a factor of safety of 6.

This factor of safety is larger than ordinary practice, and is recommended because outside stairs and balconies are usually subject to weakening through corrosion.

3534. Minimum dimensions of any structural iron or steel members shall be ¼ in. Except where embedded in masonry or concrete or where a suitable fire-resistive and waterproof covering is provided, no structural metal member shall be employed the entire surface of which is not capable of being inspected and painted.

3535. All supporting members for balconies and stairs, which are in tension and are fastened directly to the building shall pass through the wall and be securely fastened on the opposite side, or they shall be securely fastened to the framework of the building. Where metal members pass through walls, they shall be protected effectively against corrosion.

3536. Balcony and stair enclosures and railings shall be designed to withstand a horizontal pressure of 50 lbs. (with factor of safety of 6) per running foot of railing or enclosure without serious deflection, and support at walls for such railings or enclosures shall be in the manner specified in 3532 for tension members, except as provided in par. 3537 for Class C stairs.

3537. Notwithstanding the provisions of pars. 3532, 3533, and 3536, the enforcing official may approve any existing Class C fire escape stairways shown by load test or other evidence satisfactory to him to have adequate strength.

Enclosures and Rails

3541. Enclosures for balconies and stairs shall be provided for Class A not less than 60 in. high; Class B, not less than 42 in. high; Class C, not less than 36 in. high. For stairs, height shall be measured from the center of the tread.

3542. Enclosures for Class A shall be of solid, slatted, grille or screen construction, in no case with openings having a horizontal width of more than 3 in.; provided that if a lower rail is employed; not less than 2 in. and not more than 6 in. above the balcony floor, the space above such rail may have horizontal openings of not more than 6 in.; for Class B, may be three equally spaced rails.

3543. Enclosures or rails not less than 36 in. high and continuous with the stair rails shall be provided on the stair well side of balcony openings.

3544. Handrails approximately 33 in. above the forward edge of the tread (measured in line with the face of the riser) shall be provided on both sides of stairs, provided that where enclosure is not over 42 in. high the top rail of the enclosure may serve as the handrail. Construction shall be such that there will be no obstructions tending to break hand hold.

For schools which small children attend, it is advisable to provide additional hand rails about 27 in. high.

3545. Notwithstanding the provisions of pars. 3542–3544, the enforcing authority may accept, for Class C fire escape stairs only, any other arrangement of enclosures or handrails which he considers adequate for safety.

Swinging Stairs

3550. Swinging stair sections shall not be used for Class A fire escape stairs; nor for Class B except where termination over sidewalks, alleys, or driveways makes it impracticable to build

stairs permanently to the ground. Where used, swinging stairs shall comply with pars. 3551–3558.

3551. Swinging section of stairs shall not be located over doors, over the path of travel from any other exit, nor be in any location where there are or are likely to be permanent or temporary obstructions.

3552. Width of swinging section of stairs shall be at least equal to that of the stairs above.

3553. Pitch shall not be steeper than that of the stairs above.

3554. Railings shall be provided similar in height and construction to those required for the stairs above. Railings shall be designed to prevent any possibility of injury to persons at head of stairs or on balconies when stairs swing downward. Minimum clearance between moving sections where hands might be caught shall be 4 inches.

3555. If distance from lowest platform to ground exceeds 12 ft. an intermediate balcony not more than 12 ft. from the ground nor less than 7 ft. in the clear underneath, shall be provided with width not less than that of the stairs and length not less than 4 ft.

3556. Counterweight shall be provided for swinging stairs and this shall be of type balancing about a pivot, no cables being used. Counterweight shall be securely bolted in place, except that sliding ball weights or their equivalent may be used to hold stairs up and to help lower them. Counterbalancing shall be such that a weight of 150 pounds, one step from pivot will not start swinging section downward, and a weight of 150 pounds, one quarter of the length of the swinging stairs from the pivot will positively cause stairs to swing down.

3557. Pivot for swinging stairs shall either have a bronze bushing or have sufficient clearance to prevent sticking on account of corrosion.

3558. No latch to lock swinging stair section in up position shall be installed.

Latch is desirable to hold stairs down when they have once swung to ground.

CLASS D FIRE ESCAPE LADDERS

3560. No form of ladder shall be used as a fire escape under the provisions of this Code, except that ladders conforming to the following specifications may be used to provide access to unoccupied roof spaces as permitted by par. 3515, to provide a

means of escape from boiler rooms, towers as permitted by Section 29, elevated platforms around machinery or similar spaces subject to occupancy only by able-bodied adults, not more than three in number. Existing ladders may also be accepted to provide access to the street from the lowest balcony of Class C fire escape stairs, if approved by the enforcing authority, subject to the limitations in capacity specified in par. 3511.

3561. All ladders shall be permanently installed in fixed position, supported by rigid connection to the building or structure at intervals not exceeding 10 ft.

Counterbalanced and other forms of moveable ladders designed to provide access from the lowest fire escape balcony to the street are not recognized as exits by this Code.

3562. Ladders shall be constructed of iron or steel, or of other metal in design having equivalent strength and resistance to corrosion.

3563. Rails of iron or steel ladders shall be not less than ½ in. x 2 in. in section, not less than 16 in. apart.

3564. Rungs shall be not less than ⅞ in. diameter, and shall be riveted or welded in position, not less than 10 in. nor more than 12 in. on centers.

3565. The lowest rung of any ladder shall be not more than 12 in. above the level of the ground or balcony floor beneath it.

3566. Where ladders provide access to roofs or elevated platforms rails shall extend not less than 45 in. above roof line or platform floor, or 45 in. above coping or parapet if there is one. Extension of side rails to roof shall be carried over coping or parapet to afford hand hold.

3567. Ladders shall be arranged parallel to buildings, or structures, with travel either between ladder and building, in which case minimum clearance between center of rungs and building shall be 27 in., or outside of ladder, in which case minimum clearance between center of rungs and building shall be 6½ in.

3568. Ladders shall be vertical, or may be positively inclined. No negative incline (ladder sloping out over head of person using it) shall be permitted.

CLASS E WOODEN FIRE ESCAPE STAIRS

3570. Class E fire escapes shall include fire escapes constructed of wood, conforming to the preceding specifications for Class A, B or C fire escape stairs, but with wooden members of dimensions sufficient to provide strength at least equivalent to that specified for steel construction.

3571. Class E fire escape stairs shall not be used as required exits, except that existing stairs, if in sound condition, may be continued in use on small dormitories, lodging houses and one or two-family dwellings, or for access to certain towers of limited occupancy as specified in Section 29.

CLASS F WOODEN FIRE ESCAPE LADDERS

3575. Class F fire escapes shall include ladders constructed of wood, conforming to the preceding specifications for Class D fire escape ladders, but with wooden members of dimensions sufficient to provide strength at least equivalent to that required for steel construction.

3576. Class F fire escape ladders shall not be used as required exits, except that existing ladders, if in sound condition, may be continued in use for access to certain towers of limited occupancy as specified in Section 29, or for access to unoccupied spaces.

MAINTENANCE AND PAINTING

(Applies to all classes of Fire Escapes)

3581. Steel members, unless galvanized, shall be painted before and after erection.

3582. Fire escapes shall be inspected at least annually, and shall be scraped and painted as often as necessary to maintain them in proper condition at all times.

3583. Fire escape stairs and balconies or platforms shall be kept clear of all incumbrances and shall be promptly cleaned after snow or ice has accumulated upon them.

3584. Any obstructions which may interfere with the full use of the fire escape stairs, such as clotheslines, awnings, signs, ventilating or air conditioning ducts, telephone or electric power wires, shall be immediately removed.

The National Electrical Code contains provisions applicable to the maintenance of safe clearance between wires and fire escape stairs or balconies.

SIGNS AND LIGHTING

(Applies to all classes of Fire Escape Stairs)

3591. Fire escape stairs and exit ways leading thereto shall have signs in accordance with Section 53 except that the signs shall have in addition the words **"Fire Escape"** in plain letters not less than 2½ in. high.

3592. Fire escape stairs and ways of access thereto shall be illuminated in accordance with Section 53, except that where street lighting provides adequate illumination for fire escape stairs further lighting may be waived.

SECTION 36. SLIDE ESCAPES
(Spiral and Straight Chutes)

Use and Capacity Rating

3601. Slide escapes shall not be used as required exits except as specifically authorized by Chapter II, which provides for the following use:

(*a*) To supplement otherwise inadequate exit facilities in Educational Buildings and Institutional Buildings.

(*b*) As a primary exit from upper stories of high hazard manufacturing or storage buildings or structures.

3602. Slide escapes shall only be counted as exits when regularly used in drills, or for normal exit (as in leaving work in a high hazard factory), so that the sliding surface through regular use will be maintained in smooth condition and so that occupants are through practice, familiar with their use.

3603. Slide escapes, where permitted as required exits, shall be rated at one exit unit per slide, with rated travel capacity of 60 persons per minute.

Actual rate of descent of slides is greater, but capacity rating is necessarily limited by capacity of doors or other ways of approach.

3604. Slide escapes, except as permitted for high hazard manufacturing buildings or structures, shall not constitute more than 25% of the required number of units of exit width from any building or structure or any individual story or floor thereof.

Types

3611. This Section covers spiral and straight chutes attached to buildings or structures or erected independently of them, but connected by bridges, including:

(*a*) Vertical spiral enclosed chutes.

(*b*) Vertical spiral open chutes.

(*c*) Enclosed straight chutes parallel to or at right angles to buildings.

(*d*) Open straight chutes parallel to or at right angles to buildings.

Design

3621. For all chutes the slope shall be not less than 24 degrees and not more than 42 degrees with the horizontal. On spiral

chutes the slope shall be measured by developing the spiral line on the cylindrical section two feet from the inner edge.

Where hospital pads are to be used a relatively steep pitch is desirable but not to exceed 42 degrees.

3622. On all straight chutes having slopes greater than 30 degrees there shall be a section at the lower end at least 10 feet long, set at an angle not to exceed 15 degrees with the horizontal, connected with the upper section by a curved compensating section.

3623. On spiral chutes, transition from one pitch interval to another where necessary on account of differing story heights shall be made by the use of compensating plates so that there is no perceptible interruption of the slide.

3624. Spiral chutes for ordinary use shall be not less than 28 inches nor more than 42 inches wide; straight chutes shall be not less than 24 inches nor more than 42 inches wide. Where hospital pads are to be used the clear width shall be not less than 34 inches and not more than 42 inches for either spiral or straight chutes.

3625. The slideways of spiral chutes shall be banked from a point 12 inches from the outer edge to a point 5 inches above the level of the center of the chute.

3626. The horizontal distance between vertical supports for straight chutes shall not exceed 10 feet. Spiral chutes shall be braced to the building at each entrance floor and at other points if necessary so that the braces will not be more than 10 ft. apart.

3627. On enclosed chutes, doors shall be provided at each entrance, swinging with the exit travel, so constructed that they will not obstruct the use of the chute; the door openings shall be at least 30 inches wide and at least 6 feet 6 inches high, except that where hospital pads are to be used the openings shall be not less than 34 inches wide. Where entrance is direct from the building with no intervening landing or balcony, access openings shall be not less than 42 inches high.

Location and Arrangement

3631. Chutes installed inside buildings shall conform to all requirements for enclosure of stairways (see Sections 33 and 43).

3632. Chutes installed outside buildings shall be protected from fire within the building to which they are attached by one of the following methods. The order indicates the desirability of protection:

(*a*) Noncombustible and enclosed chutes affording protection against weather, smoke or fire and with access direct or through covered balconies at vestibules.

(*b*) Chutes entirely shielded by blank walls, access from wall openings to chutes being by horizontal balconies.

(*c*) Chutes shielded by approved *stationary* metal frame, windows glazed with wired glass, and balconies extending in one or both directions to openings protected with approved doors or wired glass windows in a manner similar to that required for the protection of Fire Escape Stairs (see Section 35).

3633. The lower edge of the chute at the discharge point shall be at least 12 in. and not more than 20 in. above the ground or walkway level. Where hospital pads are to be used on a chute, the lower end shall terminate in a straight, level discharge table at least 15 feet in length, so arranged as to allow access to both sides.

3634. No doors shall be allowed at bottom or discharge point of chute.

3635. On enclosed chutes in locations where snow or ice may obstruct the discharge point, a shed shall be provided, made of noncombustible materials, having a clear height of not less than 7 feet, with roof not less than 8 feet wide and not less than 8 feet long, connected with the enclosure of the chute by metal flashing. Where discharge tables are installed the roof shall extend at least 4 feet beyond the end of the table.

3636. All chutes shall lead directly to the street, to a yard or court connected with the street, or to a fire-resistive passage leading to the street. Such fire-resistive passage shall be at least 44 in. wide, shall be unpierced and shall be not less than 8 feet in height for new buildings and 7 feet in height for existing buildings. Where chutes discharge, the adjacent exposing wall openings, if any, shall be protected in a standard manner to provide for safety of egress.

3637. On open spiral chutes the minimum height of outer side shall be 36 inches above the lowest point of the adjacent slideway in the same radial vertical plane, except at entrances. On open straight chutes the minimum height of both sides shall be 24 inches above the lowest point of the slideway (measured vertically), and in all cases shall be as high as the width of the slideway.

3638. On straight chutes the entrance landing shall be flush with the lowest point in the adjoining surface of the slideway. On spiral

chutes the center of the entrance landing shall be not less than 12 inches nor more than 18 inches above the lowest point in the adjacent slideway in the same radial vertical plane.

Materials and Strength

3641. Iron, steel, concrete, or other approved noncombustible materials shall be used in construction of slide escapes, balconies, platforms and other features appurtenant thereto.

3642. Slideways shall be made of galvanized steel or other approved material with similarly smooth and corrosion resistant surfaces. Joints shall lap over in the direction of descending load or with edges of adjoining sections flanged so as to form a flush joint; all rivets, bolts, etc., to be flat-headed, countersunk, and protected by solder to form a smooth sliding surface.

3643. The chutes and their supports shall be designed to carry the weight of the structure itself and 100 lbs. per lineal foot of slide (as measured at the middle of the slideway) with a factor of safety of 6. Balconies shall be designed to carry a live load of 100 lbs. per sq. ft., with a factor of safety of 6.

The factor of safety of 6 is specified because chute supports and balconies are particularly subject to weakening through corrosion.

3644. All supporting members for balconies and chutes, which are in tension and are fastened directly to the building shall pass through the wall and be securely fastened on the opposite side, or they shall be securely fastened to the framework of the building. Where metal members pass through walls, they shall be protected effectively against corrosion.

3645. Balcony and chute enclosures and railings shall be designed to withstand a horizontal pressure of 50 lbs. (with factor of safety of 6) per running foot of railing or enclosure without serious deflection, and support at walls for balcony railings or enclosures shall be in manner specified in par. 3644 for tension members.

Access to Chutes

3651. Access shall be through doorways flush with the floor. Only approved forms of doors may be used. Doors, or approved

casement windows swinging with the exit travel, shall be used, provided that:

(*a*) Minimum clear width is 30 inches when open.

(*b*) Minimum height of door opening is 6 feet 6 inches except as provided in par. 3627.

3652. Doors and casement windows shall swing with the exit travel and shall not obstruct exit width during any point of their swing.

3653. Where doors or casement windows lead to outside balconies, the level of the balcony floor shall be level with or not more than 7 in. below the sill level.

3654. No gratings, or other obstructions, shall be placed at or over any exit opening, except in institutional buildings as permitted by Section 23; provided, however, that insect screens may be installed when essential if they are free from heavy cross members and are arranged to open out in a manner which will not interfere with exit travel and are not held closed other than by a spring or a simple, readily operated latch.

Signs and Lighting

3661. Straight or spiral chutes and passageways thereto shall have illumination and signs the same as required for fire escape stairs (Section 35), but no light shall be required within chutes. Signs directing the way and at the entrances to such chutes shall have in addition to the words specified in Section 53 the words **"Straight Chute"** or **"Spiral Chute"** as the case may require in letters not less than 2½ inches high.

SECTION 37. ESCALATORS AND MOVING WALKWAYS

3701. Escalators, otherwise known as moving stairways, electric stairways or motor stairs, shall be accepted as the equivalent of ordinary stairways where designed as exits and complying with all requirements of this Code, subject to the provisions of Chapter II.

The several Sections of Chapter II include provisions on the use of escalators as exits in various occupancies. They are not recognized as required exits in educational and institutional occupancies, residential occupancies other than hotels, or storage occupancies. Escalators as commonly installed in most occupancies are not so arranged and protected as to qualify as required exits. However, in mercantile occupancies where open stairs to second floor or basement are permitted under specified conditions, open escalators may serve on the same basis as open stairways to provide a path of travel to reach an outside exit. See Section 25 for details.

3702. Escalators not qualifying as required exits shall nevertheless be enclosed or protected as provided in Section 43, and shall have near the point of entrance to each flight a sign or signs indicating the direction to reach a stairway or other recognized exit in accordance with Section 53, unless exits are so near and clearly visible that their location is unmistakable even without signs.

Persons seeking to leave a building are likely to try to leave by the same route by which they entered. For this reason, other exits, with unmistakable path of travel to reach them from the vicinity of the escalator, are essential in case fire or smoke should block the escalator.

3703. All escalators serving as required exits shall comply with all requirements for exit stairs as specified in Section 33, except as modified by this Section, including enclosure of the escalator and its appurtenant landings to provide a continuous safe path of travel to the street, exit signs, lighting and other features the same as required for stairs.

See pars. 3714 and 3715 for modifications in dimensions.

3704. Where escalators are used in conjunction with other types of required exit, combined to form a single way of required exit as, for example, where an enclosed escalator is used on the lower floors of a building and the upper floors are served by a stairway connecting with the escalator, each type of required exit shall comply with the requirements of the individual section of Chapter III which is applicable, and the combined exit types shall be so arranged that the combination of facilities will, in its entirety, provide a safe path of exit in conformity with the general principles of this Code.

Construction and Arrangement

3711. Escalators serving as required exits shall be of approved type suitably designed for their intended service.

Further information on construction features for escalators may be found in the American Standard Safety Code for Elevators, Dumb-waiters and Escalators.

3712. Only escalators operating in the direction of exit travel shall be given credit as required means of exit except that in factories and office buildings where regularly used by employees entering and leaving, reversible escalators may be accepted as required means of exit, provided that a readily accessible main operating panel, from which all escalator units in the exit group may be stopped or reversed, is located on the street or ground floor adjacent to and in the same enclosure with the escalators, and reliable arrangements are made through fire exit drill procedures or otherwise to operate the escalator in the proper direction in case of emergency.

It is assumed that where escalators serve as required exits they will be continued in operation in case of fire, but that in case they stop due to electric current failure or other cause they may be used as ordinary stairs.

3713. Escalators serving as required means of exit shall be of horizontal tread type and shall be of noncombustible construction throughout except step tread surfaces, handrails and step wheels.

Inclined step tread type escalators are not acceptable as required means of egress.

3714. For escalators serving as required exits the minimum width of the steps shall be not less than 35 in. and the height of the step risers not more than 8½ in. Above the handrails there shall be a clear width of not less than 44 in.

3715. No single escalator serving as a required exit shall have a vertical travel of more than two stories or 35 feet.

3716. Escalators serving as required exits shall have top and bottom landings similar to those specified for stairways serving as required exits.

Exit Capacity Rating

3721. An escalator of the minimum width and dimension specified in par. 3714 shall be credited as two units of exit width, with a rated travel of 90 persons total per minute for the escalator.

Escalators, while in operation, provide a greater rate of travel than stairways, but owing to the possibility of stopping due to electrical or mechanical failure they are rated only on the same basis as ordinary stairways.

MOVING WALKWAYS

3751. Moving walkways consisting of conveyor belts designed for transportation of persons, shall be treated as corridors or passageways if level or as ramps if inclined, and shall be accepted as exits only where they comply with all requirements applicable to corridors, passageways or ramps.

3752. Moving walkways shall be accepted as required exits only for travel in the direction of the movement of the walkway.

3753. The exit capacity or rate of travel on a moving walkway shall be determined on the assumption that the walkway is stopped.

SECTION 38. ELEVATORS

3801. Elevators shall not constitute required means of exit.

Elevators have a capacity roughly equivalent to three average elevators for one unit of stairway width, and have been recognized as required exits by prior editions of the Building Exits Code under certain limited conditions. They have, however, some inherent characteristics which may make them unsuitable for emergency exit use, such characteristics being accentuated in modern automatic elevators where no operator is available to exercise judgment in the control of the elevator in case of fire or other emergency. Some of the reasons why elevators are not recognized as required exits are summarized in the following paragraphs.

Persons seeking to escape from a fire by means of an elevator may have to wait at the elevator door for some time, during which they may be exposed to fire or smoke, or panic may develop.

Automatic elevators respond to the pressing of buttons in such a way that it would be quite possible for an elevator in use for descent from floors above a fire to stop automatically at the floor involved in the fire and the doors to open automatically exposing occupants to fire and smoke.

Modern elevators cannot start until doors are fully closed and a large number of people seeking to crowd into an elevator in case of emergency might make it impossible to start.

Any power failure, such as the burning out of electric supply cables during a fire, may render the elevators inoperative or might result in trapping persons in elevators stopped between floors and under fire conditions there might not be time to permit rescue of trapped occupants through emergency escape hatches or doors.

Notwithstanding the above limitations of elevators for emergency exit purposes, they may serve an important function as a supplemental facility, particularly in occupancies such as hospitals. Elevators are also important for very high buildings or deep underground spaces where travel over considerable vertical distance on stairs might be such as to cause collapse of persons not accustomed to such physical effort before they reach the street.

In such cases required exits such as stairs or horizontal exits may be used to escape from the area of immediate danger in a fire, and elevators used to complete the travel to the street. It may reasonably be assumed that in all buildings of sufficient height to indicate the need for elevators as supplementary exit facilities, elevators will be provided for normal uses and for this reason no requirement for the installation of elevators is included in the Building Exits Code.

3802. All elevator cars shall be provided with escape hatches or doors designed to permit the escape or rescue of occupants in case they are trapped by stopping of cars between floors due to power failure incident to fire or other emergency.

Such escape facilities are specified in detail in the Elevator Safety Code.

3803. Elevator shafts shall be enclosed and protected to prevent the spread of fire and smoke in accordance with the requirements of Section 43, except in so far as unprotected vertical openings are permitted by the applicable section of Chapter II.

SECTION 39. HORIZONTAL EXITS

3901. A horizontal exit for the purposes of this Code shall consist of a way of passage, on the same or approximately the same level, from one building or fire area to an area of refuge in another building, or in the same building if separated by a fire wall, party wall or fire partition affording safety from any fire or smoke therefrom in the area from which escape has been made or in any other area below and communicating therewith.

Horizontal exits should not be confused with egress through doors in smoke stop partitions as specified for educational and institutional occupancies. Smoke stop doors are designed only for temporary protection against smoke, whereas horizontal exits provide protection against serious fire for a relatively long period of time in addition to providing immediate protection from smoke.

3902. Horizontal exits, in accordance with this section of the Code, may be substituted for stairways or other exits, in accordance with the applicable sections of Chapter II, provided, however, that the aggregate exit capacity of stairs, ramps, fire escapes and doors leading outside the building shall not be less than half that which would otherwise be required for the entire area of the building or connected buildings if there were no horizontal exits.

Example: A department store building 270 x 210 feet (population 945 per floor) would be required by this Code to have exits from the upper floors sufficient to furnish 16 units of exit width. This would ordinarily require 8 44-inch stairways.

Assume now this building is divided by a fire wall into two sections, each 135 x 210 feet, with doors through the wall furnishing horizontal exits. Each section, considered separately, will require four, 2-unit exits. The horizontal exits will serve as two of the four exits required for each section, and only two stairways will be required for each section if the exits can be arranged to meet the requirements for the 150-ft. distance from any point which can be done in a sprinklered building. Thus the total number of stairways required for the building will be four, as compared with eight if no horizontal exit is provided. However, if the building were further subdivided by a second fire wall with fire doors on openings, no further reduction in stairways would be permitted.

Egress from Area of Refuge

3911. Every fire section for which credit is allowed in connection with a horizontal exit shall have in addition to the horizontal exit or exits at least one stairway, doorway leading outside or other standard exit. Any fire section not having a stairway or doorway leading outside shall be considered as part of an adjoining section with stairway.

3912. Construction and arrangement shall be such that the stairway or other exit from each possible area of refuge cannot be obstructed by the same fire or smoke therefrom which may involve the area from which refuge is taken.

3913. Every horizontal exit for which credit is given shall be so arranged that there are continuously available paths of travel leading from each side of the exit to stairways or other standard means of egress leading to outside the building.

This requirement is complied with where the entire areas from each side of the horizontal exit to the stairways or other standard means of egress are occupied by the same tenant; or where there are standard corridors or other continuously available passageways leading from each side of the exit to stairways or other standard means of egress leading to outside the building.

3914. Doors used in connection with horizontal exits shall be kept unlocked and unobstructed whenever premises are occupied on either side of the exit.

3915. The floor area on either side of a horizontal exit shall be sufficient to hold the occupants of both floor areas allowing not less than 3 sq. ft. net clear net area per person.

Bridges and Balconies

3921. Where horizontal exits utilize bridges between buildings, or outside balconies providing a path of travel around firewalls, such bridges or balconies shall comply with the structural requirements of Section 35, Fire Escape Stairs.

3922. Bridges or balconies shall be at least as wide as the doors leading to them, and not less than 44 in. wide for new construction.

3923. Every door, leading to a bridge or balcony serving as a horizontal exit from a fire area, shall swing with the exit travel out of the fire area.

3924. Where the bridge or balcony serves as a horizontal exit in one direction, only the door from the bridge or balcony into the area of refuge shall swing in.

3925. Where the bridge or balcony serves as a horizontal exit in both directions, doors shall be provided in pairs swinging in opposite directions, only the door swinging with the exit travel to be counted in determination of exit width, unless the bridge or balcony has sufficient floor area to accommodate the population of either connected building or fire area on the basis of 3 sq. ft.

per person or in existing buildings by specific permission of the enforcing authority, in which case doors on both ends of the bridge or balcony may swing out from the building.

3926. The bridge or balcony floor shall be level with the building, except that where there is a possibility of blocking doors by snow or ice the bridge or balcony floor shall be approximately 7¾ in. below the building floor level.

3927. Where there is a difference in level between connected buildings or floor areas ramps shall be employed in accordance with Section 34; no steps shall be used except that for differences in level of more than 21 in. stairs in accordance with Section 33 or outside stairs in accordance with Section 35 may be used.

One or two steps at a doorway are considered to constitute an accident hazard in emergency use. Stairways with level landings between door and stair, as required by Sections 33 and 35 are satisfactory.

3928. All wall openings, in both of the connected buildings or fire areas, any part of which are within 10 ft. of any bridge or balcony as measured horizontally or below shall be protected with fire doors or metal frame wired glass windows, preferably with stationary sash; provided, however, that where bridges have solid sides not less than 6 ft. in height, such protection of wall openings may be omitted.

Openings through Walls for Horizontal Exits

3931. Walls or partitions separating areas between which there are horizontal exits shall be of standard construction, completely separating the areas, providing fire resistance appropriate to the type of building construction and occupancy; and in any case not less than 2 hours fire resistance, as determined in accordance with the provisions of Section 41.

3932. All openings in such walls, whether or not such openings serve as exits, shall be adequately protected in a standard manner against the passage of fire or smoke therefrom.

NFPA Standard No. 80 Protection of Openings in Walls and Partitions, covers the installation of fire doors and other forms of protection.

3933. Swinging fire doors on horizontal exits shall swing with the exit travel. Where a horizontal exit serves areas on both sides of a wall there shall be adjacent openings with swinging doors at each, opening in opposite directions, with signs on each side of the wall or partition indicating as the exit the door which

swings with the travel from that side; or other approved arrangements providing doors always swinging with any possible exit travel.

The customary requirement of building codes for fire doors on both sides of an opening in a fire wall may be met by having an automatic sliding fire door on one side, and a self-closing fire door swinging out from the other side of the wall. This arrangement qualifies only as a horizontal exit from the side of the sliding door.

3934. Normally open automatic sliding fire doors shall not be used on horizontal exits serving as part of the required exit capacity of building except by specific permission of the enforcing authority where the area of the door or doors is so small in relation to the area of the wall, and the volume of the connected spaces and other conditions are such that there is no appreciable hazard of a dangerous accumulation of smoke or fire gases in the area of refuge before there has been sufficient heat to actuate the self-closing mechanism of the door.

Automatic doors as often installed covering the entire cross section of a building corridor do not qualify as horizontal exits under these provisions, as dangerous quantities of smoke might pass through the corridor before there is sufficient heat to close the door.

Automatic sliding doors are also open to the objection that once closed they are difficult to open and thus may trap people behind them in the absence of other available means of escape.

Units of Exit Width

3941. Units of exit width for horizontal exits shall be the same as specified in Section 32, Doors.

Omission of Fire Partition on Street Floor

3951. Where fire partitions are used to provide horizontal exits on upper floors of a building but the street or ground floor is one open fire area, the horizontal exits shall qualify as required exits only where safeguards are provided to prevent spread of fire or smoke from the street or ground floor to floors above on either side of the fire partition as specified in par. 3952 and required exits from the upper floor areas on both sides of the fire partitions lead outside without travel through the street or ground floor area.

3952. Safeguards to prevent the spread of fire and smoke upwards from a street or ground floor area shall consist of complete fire-resistive construction with no opening between street and ground floor area and stories above, or if there are openings such as for stairs or elevators protection shall consist of fire-resistive

enclosures with fire doors at all openings in the enclosure as specified in pars. 4303–4, and complete automatic sprinkler protection in accordance with Section 46.

3953. Where fire partitions are used to provide horizontal exits for basement floors or any floors below the street or ground level, but the street floor is one open fire area, the horizontal exits shall qualify as required exits only where the construction of the building is fire resistive or complete automatic sprinkler protection is provided, and all required exits from all basement or below-grade areas on both sides of the fire partition lead outside without travel through the street or ground floor area.

Chapter IV
CONSTRUCTION AND PROTECTION

SECTION 41. CONSTRUCTION TYPES

4101. Building construction types, for the purposes of this Code, shall be classified as fire-resistive or non-fire-resistive.

4102. Fire-resistive construction shall be the type of construction thus described in NFPA Standard No. 220, Standard Types of Building Construction, with classifications 2-hour or 3-hour, fire resistance.

4103. All other types of construction shall be classed as non-fire-resistive, provided, however, that where noncombustible materials are specified elsewhere in this Code such shall be differentiated from combustible construction, and further provided that where specified protection is required for combustible construction such protection shall be installed.

The differentiations between various types of combustible construction commonly found in building codes, which must consider limitation of conflagration hazard and other phases of public interest as well as life hazard from fire, have little application to life safety and accordingly are not generally recognized in the Building Exits Code. For example a building of wood interior construction with combustible contents presents substantially the same life hazard to its occupants irrespective of whether or not the combustible interior is enclosed within exterior brick walls.

4104. Where differentiation between different types of non-fire-resistive construction is indicated elsewhere in the Code, this shall be based upon the following:

Heavy Timber Construction
: So-called mill construction or slow burning construction, masonry walls

Non-Combustible Construction
: Permits unprotected steel

Protected Non-Combustible Construction
: One hour structural fire resistance, but not sufficient to qualify as fire-resistive construction

Ordinary Construction
: Masonry walls, wood interior

Protected Ordinary Construction
One hour structural fire resistance

Wood Frame Construction
Lighter than Heavy Timber

Protected Wood Frame Construction
One hour structural fire resistance

For further details see NFPA No. 220, Standard Types of Building Construction.

Fire Resistance Ratings

4111. Fire resistance ratings in hours as specified elsewhere in this Code shall be the generally accepted ratings determined on the basis of ability to withstand fire exposure in standard tests designed to simulate exposure to fire of the indicated duration.

The test used by nationally recognized testing laboratories in the U. S. and Canada is described in "Standard Methods of Fire Tests of Building Construction and Materials," NFPA No. 251, ASTM No. E119. British standard fire test methods are similar.

SECTION 42. HEIGHTS AND AREAS

4201. No building or structure shall be occupied in excess of the limits of height, area or distance to an exit specified herein. In case of question, the enforcing authority shall determine what constitutes occupancy.

The Building Exits Code specifies limits of height and area only for purposes of life safety from fire. Building codes generally establish limits of height and area for new buildings, depending upon type of construction and other factors. Such building code limits may be more restrictive in some cases than the provisions of the Building Exits Code, because building codes take into consideration various factors of public interest in addition to life safety from fire, and because building codes generally apply only to new construction whereas the Building Exits Code applies to existing as well as to new structures.

Heights

4211. Heights of buildings to be occupied shall be limited in accordance with their construction, arrangement and occupancy in accordance with the provisions of the applicable sections of Chapter II of this Code.

The Building Exits Code does not limit the height of buildings except in a few special cases, but deals with the inherently increased life hazard from fire in high buildings by specifying various safeguards such as the protection of vertical openings and automatic sprinkler protection.

Height limits for buildings of combustible construction are specified for hospitals and other institutional buildings because where occupants must be carried or assisted in leaving a burning building so much time may be required for evacuation that unless the building is of fire-resistive construction a fire may cause fatalities before all occupants can be evacuated through the exits.

For schools height limits for combustible construction are similarly specified because of the generally accepted public responsibility for the safety of children who are required by law to attend schools.

In the case of places of assembly the height of the building is not directly limited, but the distance of the assembly room above or below the street is limited depending upon the number of persons and character of construction.

In any case buildings of low height are preferable from the point of view of life safety from fire.

Areas

4231. No building or structure shall be occupied in any area in excess of that meeting requirements specified in Chapter II for distance of travel to an exit, or in excess of the undivided length

specified as the maximum permissible distance between smoke barriers, or the maximum occupancy limits for buildings of combustible construction specified in Section 23.

With certain minor exceptions in Section 23, the Building Exits Code does not attempt to limit areas as such, but distance requirements have the effect of limiting areas.

4232. Gross floor area of any individual story, for the purpose of determining the capacity of the floor area in numbers of persons for whom exits are to be provided, or for purposes of classification of occupancy, shall include the area within the perimeter of the outside walls of the building or section under consideration, with no deduction for hallways, stairs, closets, thickness of walls, columns or other features. Where area is referred to elsewhere in this Code it shall be understood to be gross floor area unless otherwise specified.

4233. Net floor area, for the purpose of determining number of persons for whom exits are to be provided, shall be the actual occupied area, not including accessory unoccupied areas or thickness of walls.

SECTION 43. PROTECTION OF VERTICAL OPENINGS —COMBUSTIBLE CONCEALED SPACES

4301. All stairways, elevator shafts, light and ventilation shafts, chutes and other openings between different stories or floor levels shall be enclosed or protected to prevent the spread of fire or smoke, except as unenclosed openings are specifically permitted by par. 4302 or by other sections of this Code by reason of automatic sprinkler protection or other special features.

Sections 27 and 28 specify conditions in manufacturing, garage and storage occupancies under which protection of vertical openings may be waived.

4302. In buildings other than educational or institutional, with low hazard occupancy, or with ordinary hazard occupancy with automatic sprinkler protection, where necessary to effective utilization of building sites with sloping grade or otherwise essential to the functional design of the building, not to exceed three communicating floor levels may be permitted without enclosure or protection between such areas, provided all the following conditions are met:

(*a*) The arrangement is permitted by the applicable occupancy section of this code and by the enforcing authority.

(*b*) The lowest or next to the lowest level is a street floor.

(*c*) The entire area including all communicating floor levels is sufficiently open and unobstructed so that it may be assumed that a fire or other dangerous condition in any part will be immediately obvious to the occupants of all communicating levels and areas.

(*d*) Exit capacity is sufficient to provide simultaneously for all the occupants of all communicating levels and areas, all communicating levels in the same fire area being considered as a single floor area for purposes of determination of required exit capacity.

(*e*) Each floor level, considered separately, has at least one-half of its individual required exit capacity provided by an exit or exits leading directly out of that area without traversing another communicating floor level or being exposed to the spread of fire or smoke therefrom.

(*f*) All requirements of this code with respect to interior finish, protection of hazards, construction and other features are fully observed, without waivers.

4303. Floor openings, as specified in par. 4301, shall be enclosed by substantial walls having fire resistance not less than required for stairways, par. 4304, with approved fire doors or windows provided in openings therein, all so designed and installed as to provide a complete barrier to the spread of fire or smoke through such openings.

See par. 4304 for additional provisions applying to exit enclosures.

4304. The enclosing walls of floor openings serving stairways or ramps shall be so arranged as to provide a continuous path of escape, including landings and passageways in accordance with Section 33, providing protection for persons using the stairway or ramp against fire or smoke therefrom in other parts of the building. Such walls shall have fire resistance as follows:

New buildings 4 stories or more in height, 2 hours, noncombustible construction

The application of the 2-hour rule, in buildings not divided into stories, may be based on the number of levels of platforms or walkways served by the stairs.

other new buildings, 1 hour

existing buildings, ½ hour unless a greater resistance is required by the enforcing authority in consideration of the hazard of the individual building.

Wired glass in metal frames may be accepted in existing buildings and in new buildings to such extent as permitted by other sections of this Code.

Masonry enclosing walls are generally specified for new construction. For enclosing open stairways in existing buildings various types of light construction are used, including plaster on metal lath and wired glass in metal frames.

See par. 4111 for determination of fire resistance ratings in hours.

SMOKE VENTING FOR VERTICAL OPENINGS

4311. Where vertical openings pierce more than two consecutive floors, smoke venting facilities shall be provided at or above the top story level of the opening, to minimize dangerous spread of smoke to upper floors before occupants have had time to utilize exits, except that the enforcing authority may waive this requirement in existing buildings if the construction and arrangement of the building make such venting impracticable and the existing conditions in the building are such that there is no undue danger to occupants.

4312. Smoke venting of unprotected vertical openings, where dependent on natural draft, shall be provided by skylights over the top of the vertical opening, or outside windows in the top story of the open shaft, with plain glass (not wired glass) area not less than three-quarters of the open area of the unprotected opening, such area to be measured in the plane of minimum area. Plastic glazing may be used in lieu of glass if the plastic used has melting characteristics such that under fire conditions it will melt and leave a free opening for venting in no longer time than would be required for the shattering of plain glass under the influence of heat. When plain glass glazing of a skylight is used over a stairway there shall be a substantial wire screen beneath the skylight.

4313. Smoke venting, where by mechanical draft, shall be in accordance with the provisions for smoke removal for escalator openings, pars. 4321–29, or by other approved means.

See pars. 4721–4731 for further information on smoke venting.

4314. Any vertical opening which continues through the roof without any closure, such as in a ramp type multi-story parking garage where the roof is used for parking, may be considered as automatically vented.

SPECIAL PROVISIONS FOR ESCALATOR OPENINGS

4320. Escalators serving as required exits shall be enclosed in the same manner as exit stairs. Escalators not constituting exits shall have their floor openings enclosed or protected as required for other vertical openings, provided that in lieu of such protection escalator openings in buildings completely protected by a standard supervised sprinkler system in accordance with Section 46, escalator openings may be protected by any one of the following methods as described in pars. 4321–4352.

Sprinkler-Vent Method

4321. Under the conditions specified in par. 4320, escalator openings may be protected by the "sprinkler-vent" method, consisting of a combination of an automatic fire or smoke detection system, automatic exhaust system and an automatic water curtain meeting the following requirements and of a design meeting the approval of the enforcing authority.

4322. The exhaust system shall be of such capacity as to create a downdraft, through the moving stairway floor opening, having an average velocity of not less than 300 ft. per min. under normal conditions for a period of not less than 30 minutes.

This requirement can be met by the provision of an air intake from the outside of the building above the floor opening. The test of the system under "normal" conditions requires that the velocity of the downdraft be developed when windows or doors on the several stories normally used for ventilation are open. The size of the exhaust fan and exhaust ducts must be sufficient to meet such ventilation conditions. Experience indicates that fan capacity should be based on a rating of not less than 500 cfm per sq. ft. of moving stairway opening to obtain the 300 ft. per min. required. If the building is provided with an air-conditioning system, arranged to be automatically shut down in the event of fire, the test conditions should be met with the air-conditioning system shut down. The 300 ft. per min. downdraft through the opening provides for the testing of the exhaust system without requiring an expansion of air present under actual fire conditions.

4323. Operation of the exhaust system for any floor opening shall be initiated by an approved device in the story involved and shall be by any one of the following means in addition to a manual means for operating and testing the system.

(*a*) Thermostats — either fixed temperature, rate-of-rise, or a combination of both.

(*b*) Water flow in the sprinkler system.

(*c*) Approved supervised smoke detection. Smoke detection devices, if used, shall be so located that the presence of smoke is detected before it enters the stairway.

4324. Electric power supply to all parts of the exhaust system and its control devices shall be designed and installed for maximum reliability.

The electric power supply provisions of NFPA Standard No. 20, Centrifugal Fire Pumps, may be referred to as a guide to design and installation features to assure maximum reliability.

4325. Fans and ducts used in connection with automatic exhaust systems shall be constructed and installed in a standard manner.

NFPA Standard No. 91, Blower and Exhaust Systems, contains provisions on fans and ducts which may be referred to as a criterion of standard installation.

4326. Periodic tests, not less frequently than quarterly, shall be made of the automatic exhaust system to maintain the system and the various control devices in good working condition.

4327. The 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 water curtain shall be not less than approximately three (3) gallons per minute per lineal foot of water curtain measured horizontally around the opening.

For installation of sprinklers see Section 46. The use of open sprinklers is a matter for consultation with the enforcing authority.

4328. The water curtain shall operate automatically from thermal responsive elements of fixed temperature type so placed with respect to the ceiling (floor) opening that the water curtain comes into action upon the advance of heat towards the moving stairway opening.

4329. Automatic exhaust systems, including all motors and controls and automatic water curtain systems, shall be supervised in an approved manner, similar to that specified for automatic sprinkler system supervision.

See par. 4622 for details of supervision.

Spray Nozzle Method

4331. Under the conditions specified in par. 4320, escalator openings may be protected by the spray nozzle method, consisting of a combination of an automatic fire or smoke detection system and a system of high velocity water spray nozzles meeting the following requirements and of a design meeting the approval of the enforcing authority.

4332. 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 of 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.

4333. The number and size of nozzles and water supply shall be sufficient to deliver a discharge of two (2) gallons of water per square foot per minute through the wellway, area to be figured perpendicular to treadway.

4334. Spray nozzles shall be so located as to effectively utilize the full advantage of the cooling and counter draft effect. They shall be so positioned that the center line of spray discharge is as closely as possible in line with the slope of the moving stairway; 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.

4335. Spray nozzles shall discharge at a minimum pressure of at least 25 lbs. 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 farthest from the supply riser is not reduced beyond the required minimum.

Supply taken from the sprinkler system is designed to provide protection to the wellway opening for life hazard during the exit period, but may not be relied upon to provide an effective floor cutoff.

4336. Control valves shall be readily accessible to minimize water damage.

4337. 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. When necessary, spray nozzles shall be protected against mechanical injury or tampering that might interfere with proper discharge.

4338. The spray nozzle system shall operate automatically from thermal response elements of the fixed temperature type so placed with respect to the ceiling (floor) opening that the spray nozzle system comes into action upon the advance of heat towards the moving stairway opening. Supervised smoke detection located in or near the moving stairway opening may be used to sound an

alarm. The spray nozzle system shall also be provided with manual means of operation.

Smoke detection devices are not desirable for actuation of the spray nozzles as accidental discharge must be safeguarded against from both a panic hazard as well as property damage standpoint.

4339. Control valves for the spray nozzle system, and approved smoke detection or thermostatic devices shall be supervised in accordance with the applicable provisions of Section 45.

Rolling Shutter Method

4341. Under the conditions specified in par. 4320, escalator openings above the street floor only may be protected by the rolling shutter method, consisting of an automatic self-closing rolling shutter which will completely enclose the top of each moving stairway, meeting the following requirements, and of a design meeting the approval of the enforcing authority.

The use of an automatic rolling shutter to protect moving stairway wellways between basements and street floors is not acceptable for the reason that the normal path of travel to reach a place of safety in an emergency is usually that used for access to the area. Persons seeking egress from basement areas served by moving stairways could be trapped by fully closed rolling shutters at the street floor level. Observation of rolling shutters in use indicates the likelihood that under emergency conditions there is a quite different psychological reaction by those facing its operation from upper floors than could be expected when the rolling shutter is closed above a person seeking egress from a basement. On upper floors, the operation of an automatic rolling shutter will be clearly visible to persons seeking egress and other means of egress (*i.e.*, stairways), can be readily found and used if the requirements of the Building Exits Code are followed.

4342. The shutter shall close off the wellway opening immediately upon the automatic detection, by an approved heat actuated or smoke-sensitive device, of fire or smoke in the vicinity of the moving stairway, and, in addition, there shall be provided a manual means of operating and testing the operation of the shutter.

4343. The shutter assembly shall be capable of supporting a weight of 200 pounds applied on any one square foot of area, and shall be not less resistant to fire or heat than 24 gage steel.

4344. 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.

4345. Automatic rolling shutters shall be provided with an electric contact which will disconnect the power supply from the escalator and apply the brakes as soon as the shutter starts to close, and will prevent further operation until the escalator is again in the fully open position.

4346. The electrical supply to the control devices for actuation of the automatic rolling shutter shall be so designed and installed as to provide maximum reliability.

The electric power supply provisions of NFPA Standard No. 20, Centrifugal Fire Pumps, may be referred to as a guide to design and installation features to assure maximum reliability.

4347. Rolling shutters shall be operated at least once a week in order to make sure that they remain in proper operating condition.

Partial Enclosure Method

4351. Under the conditions specified in par. 4320, escalator openings may be protected by a partial enclosure, or so-called kiosk, so designed as to provide an effective barrier to the spread of smoke from floor to floor.

4352. Partial enclosures shall be of construction providing fire resistance equivalent to that specified for stairway enclosures in the same building, with openings therein protected by approved self-closing fire doors or may be of approved wired glass and metal frame construction with wired glass panel doors. Such doors may be equipped with electric opening mechanism to open the door automatically upon the approach of a person, provided however that the mechanism shall be such as to return the door to its closed position upon any interruption of electric current supply, and provided further that the adjustment is such that the pressure of smoke will not cause opening of the door.

FIRE STOPPING — CONCEALED SPACES

4371. In new construction of combustible materials, all hollow spaces in walls, floors or ceilings through which fire might spread shall be effectively fire stopped. Fire stopping when lacking in existing construction shall be provided where required by the provisions of Chapter II.

4372. Unoccupied attic spaces under roofs of combustible construction and above combustible ceilings of occupied spaces shall be subdivided by partitions to form subdivision not to exceed 3,000 sq. ft. area in each, unless the attic is sprinklered in accordance with Section 46, or the ceiling construction beneath the attic has at least a one-hour fire resistance determined as specified in Section 41. Required partitions dividing attic spaces shall be of noncombustible construction, or if combustible shall be designed to provide not less than one-half hour fire resistance, and any access openings therein shall be provided with closures at least equivalent to the construction of the partition.

SECTION 44. INTERIOR FINISH

4401. Interior finish shall include the material of walls, ceilings and other exposed interior surfaces of buildings, comprising both the plaster, wood or other interior finish material and any surfacing material such as paint or wallpaper applied thereto. Interior finish includes materials affixed to the building structure as distinguished from decorations or furnishings which are not so affixed.

4402. Finish floors and floor coverings shall be exempt from the requirements of this section provided, however, that in any case where the enforcing authority finds a floor surface of unusual hazard the floor surface shall be considered a part of the interior finish for the purposes of this Code.

4403. The classification of interior finish materials specified in par. 4411 shall be that of the basic material used, without regard to subsequently applied paint or wallpaper, except that the enforcing authority shall include such finishes in the determination of classification in any case where in the opinion of the enforcing authority they are of such character or thickness or so applied as to affect materially the flame spread characteristics.

4411. Interior finish materials shall be grouped in the following classes, in accordance with their flame spread and related characteristics:

Class A Interior Finish. Flame Spread 0-20
Includes any material classified at 20 or less on the test scale described in par. 4412 and any element thereof when so tested shall not continue to propagate fire.

Class B Interior Finish. Flame Spread 20-75
Includes any material classified at more than 20 but not more than 75 on the test scale described in par. 4412.

Class C Interior Finish. Flame Spread 75-200
Includes any material classified at more than 75 but not more than 200 on the test scale described in par. 4412.

Class D Interior Finish. Flame Spread 200-500
Includes any material classified at more than 200 but not more than 500 on the test scale described in par. 4412.

Class E Interior Finish. Flame Spread over 500
Includes any material classified at over 500 on the test scale described in par. 4412.