

NFPA 101B

Code for Means of Egress for Buildings and Structures

2002 Edition



NFPA, 1 Batterymarch Park, PO Box 9101, Quincy, MA 02269-9101
An International Codes and Standards Organization

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NFPA 101B

Code for

Means of Egress for Buildings and Structures

2002 Edition

This edition of NFPA 101B, *Code for Means of Egress for Buildings and Structures*, was prepared by the Technical Committee on Means of Egress, released by the Technical Correlating Committee on Safety to Life, and acted on by NFPA at its May Association Technical Meeting held May 19–23, 2002, in Minneapolis, MN. It was issued by the Standards Council on July 19, 2002, with an effective date of August 8, 2002, and supersedes all previous editions.

This edition of NFPA 101B was approved as an American National Standard on July 19, 2002.

Origin and Development of NFPA 101B

NFPA 101B, first published in 1999, was developed to address a subset of the subject areas covered by NFPA 101[®], *Life Safety Code*[®] — namely, means of egress. NFPA offers NFPA 101B as a model reference for mandatory use by the model building codes in lieu of those codes' individual chapters on means of egress. See A.1.3 in Annex A.

This 2002 edition reflects the requirements of the 2000 edition of NFPA 101.



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NOTICE: An asterisk (*) following the number or letter designating a paragraph indicates that explanatory material on the paragraph can be found in Annex A.

Changes other than editorial are indicated by a vertical rule beside the paragraph, table, or figure in which the change occurred. These rules are included as an aid to the user in identifying changes from the previous edition. Where one or more complete paragraphs have been deleted, the deletion is indicated by a bullet between the paragraphs that remain.

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Information on referenced publications can be found in Chapter 2 and Annex C.

Chapter 1 Administration**1.1 Scope.**

1.1.1 Title. NFPA 101B, *Code for Means of Egress for Buildings and Structures*, shall be known as the *Means of Egress Code*, is cited as such, and shall be referred to herein as “this *Code*” or “the *Code*.”

1.1.2* Danger to Life from Fire. This *Code* addresses those egress features necessary to minimize danger to life from fire and smoke, crowd pressures, and movement of individuals and groups.

1.1.3 Egress Facilities. The *Code* establishes minimum criteria for the design of egress facilities in order to permit prompt escape of occupants from buildings or, where desirable, into safe areas within buildings.

1.1.4 Areas Not Addressed. The *Code* does not attempt to address the following:

- (1) General fire prevention or building construction features that are normally a function of fire prevention codes and building codes
- (2) Prevention of personal injuries incurred by an individual's own negligence
- (3) Preservation of property from loss by fire

1.2* Purpose. (Reserved).**1.3* Application.****1.3.1 New Construction.**

1.3.1.1 Means of egress for new construction shall comply with Chapter 5 of this *Code* except as modified by 1.3.2 and 1.3.3.

1.3.1.2 Large residential board and care occupancies with impractical evacuation capability shall meet the general requirements of Chapter 5 and those requirements specifically applicable to health care occupancies.

1.3.1.3 Where residential board and care occupancies are located within apartment buildings, the parts of the means of egress serving the apartment(s) used as a residential board and care occupancy shall meet the general requirements of Chapter 5 and those requirements specifically applicable to apartment buildings.

1.3.1.4 Ambulatory health care facilities shall be exempt from the means of egress requirements applicable to health care occupancies, provided the facility meets the general requirements of Chapter 5 and those requirements specifically applicable to business occupancies and ambulatory health care facilities.

1.3.1.5* Use Condition I detention and correctional occupancies shall meet the general requirements of Chapter 5 and those requirements specifically applicable to either residential occupancies or Use Condition II detention and correctional occupancies.

1.3.2 Means of Escape.

1.3.2.1 The means of escape provisions of Chapter 6 shall apply to the following:

- (1) One- and two-family dwellings
- (2) Dwelling units of apartment buildings
- (3) Guest rooms or guest suites of hotels and dormitories
- (4) Lodging and rooming houses
- (5) Small residential board and care occupancies

1.3.2.2 Means of egress from dwelling units to the outside and from guest rooms or guest suites to the outside shall be in accordance with Chapter 5.

1.3.3 Alterations, Repairs, or Change of Occupancy in Existing Structures. Alterations, repairs, or change of occupancy in existing structures shall comply with Chapter 5 as modified by Chapter 7.

1.4 Equivalency.

1.4.1* Equivalency Option. Nothing in this *Code* is intended to prevent the use of systems, methods, or devices of equivalent or superior quality, strength, fire resistance, effectiveness, durability, and safety as alternatives to those prescribed by this *Code*, provided that technical documentation is submitted to the authority having jurisdiction to demonstrate equivalency and the system, method, or device is approved for the intended purpose by the authority having jurisdiction.

1.4.2* Equivalency Compliance. Alternative systems, methods, or devices approved as equivalent by the authority having jurisdiction shall be recognized as being in compliance with this *Code*.

1.5 Units and Formulas.

1.5.1 SI Units. Metric units of measurement in this *Code* are in accordance with the modernized metric system known as the International System of Units (SI).

1.5.2 Primary Values. The SI value for a measurement, and the equivalent inch-pound value given in parentheses, shall each be acceptable for use as primary units for satisfying the requirements of this *Code*.

1.6 Enforcement. This *Code* shall be administered and enforced by the authority having jurisdiction designated by the governing authority. (See Annex B for sample wording for enabling legislation.)

Chapter 2 Referenced Publications

2.1 General. The documents or portions thereof listed in this chapter are referenced within this code and shall be considered part of the requirements of this document.

2.2 NFPA Publications. National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101.

NFPA 13, *Standard for the Installation of Sprinkler Systems*, 2002 edition.

NFPA 30, *Flammable and Combustible Liquids Code*, 2000 edition.

NFPA 70, *National Electrical Code*®, 2002 edition.

NFPA 72®, *National Fire Alarm Code*®, 2002 edition.

NFPA 80, *Standard for Fire Doors and Fire Windows*, 1999 edition.

NFPA 99, *Standard for Health Care Facilities*, 2002 edition.

NFPA 110, *Standard for Emergency and Standby Power Systems*, 2002 edition.

NFPA 111, *Standard on Stored Electrical Energy Emergency and Standby Power Systems*, 2001 edition.

NFPA 251, *Standard Methods of Tests of Fire Endurance of Building Construction and Materials*, 1999 edition.

NFPA 252, *Standard Methods of Fire Tests of Door Assemblies*, 1999 edition.

NFPA 257, *Standard on Fire Test for Window and Glass Block Assemblies*, 2000 edition.

2.3 Other Publications.

2.3.1 ANSI Publications. American National Standards Institute, Inc., 11 West 42nd Street, 13th floor, New York, NY 10036.

ANSI A14.3, *Safety Code for Fixed Ladders*, 1992.

ICC/ANSI A117.1, *American National Standard for Accessible and Usable Buildings and Facilities*, 1998.

BHMA/ANSI A156.19, *American National Standard for Power Assist and Low Energy Power Operated Doors*, 1997.

ANSI A1264.1, *Safety Requirements for Workplace Floor and Wall Openings, Stairs and Railing Systems*, 1995.

2.3.2 ASME Publication. American Society of Mechanical Engineers, Three Park Avenue, New York, NY 10016-5900.

ASME/ANSI A17.1, *Safety Code for Elevators and Escalators*, 2000.

2.3.3 ASTM Publication. American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

ASTM F 851, *Standard Test Method for Self-Rising Seat Mechanisms*, 1987.

2.3.4 UL Publication. Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062.

UL 924, *Standard for Safety Emergency Lighting and Power Equipment*, 1995.

Chapter 3 Definitions

3.1 General. The definitions contained in this chapter shall apply to the terms used in this *Code*. Where terms are not in-

cluded, common usage of the terms shall apply. Words used in the present tense shall include the future; words used in the masculine gender shall include the feminine and neuter; the singular number shall include the plural and the plural shall include the singular. Where terms are not defined in this chapter, they shall be defined using their commonly accepted meanings within the context in which they are used. *Webster's Third New International Dictionary of the English Language, Unabridged*, shall be a source for commonly accepted meaning.

3.2 NFPA Official Definitions.

3.2.1* Approved. Acceptable to the authority having jurisdiction.

3.2.2* Authority Having Jurisdiction (AHJ). The organization, office, or individual responsible for approving equipment, materials, an installation, or a procedure.

3.2.3* Code. A standard that is an extensive compilation of provisions covering broad subject matter or that is suitable for adoption into law independently of other codes and standards.

3.2.4 Labeled. Equipment or materials to which has been attached a label, symbol, or other identifying mark of an organization that is acceptable to the authority having jurisdiction and concerned with product evaluation, that maintains periodic inspection of production of labeled equipment or materials, and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.

3.2.5* Listed. Equipment, materials, or services included in a list published by an organization that is acceptable to the authority having jurisdiction and concerned with evaluation of products or services, that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services, and whose listing states that either the equipment, material, or service meets appropriate designated standards or has been tested and found suitable for a specified purpose.

3.2.6 Shall. Indicates a mandatory requirement.

3.2.7 Should. Indicates a recommendation or that which is advised but not required.

3.3 General Definitions.

3.3.1 Accessible Means of Egress. See 3.3.69.1.

3.3.2* Aisle Accessway. That initial portion of an exit access that leads to an aisle.

3.3.3 Ambulatory Health Care Facility. See 3.3.74.1.

3.3.4 Anchor Store. A department store or major merchandising center that has direct access to the covered mall but in which all required means of egress is independent of the covered mall.

3.3.5 Area.

3.3.5.1 Floor Area.

3.3.5.1.1 Gross Leasable Area. The total floor area designated for tenant occupancy and exclusive use, expressed in square meters (square feet), measured from the centerlines of adjoining partitions and exteriors of outside walls.

3.3.5.1.2 Hazardous Area. An area of a structure or building that poses a degree of hazard greater than that normal to the general occupancy of the building or structure, such as those

areas used for the storage or use of combustibles or flammables; toxic, noxious, or corrosive materials; or heat-producing appliances.

3.3.5.1.3 Living Area. Any normally occupiable space in a residential occupancy, other than sleeping rooms or rooms that are intended for combination sleeping/living, bathrooms, toilet compartments, kitchens, closets, halls, storage or utility spaces, and similar areas.

3.3.6* Area of Refuge. An area that is either (1) a story in a building where the building is protected throughout by an approved, supervised automatic sprinkler system and has not less than two accessible rooms or spaces separated from each other by smoke-resisting partitions; or (2) a space located in a path of travel leading to a public way that is protected from the effects of fire, either by means of separation from other spaces in the same building or by virtue of location, thereby permitting a delay in egress travel from any level.

3.3.7 Atmosphere.

3.3.7.1 Common Atmosphere. The atmosphere that exists between rooms, spaces, or areas within a building that are not separated by an approved smoke barrier.

3.3.7.2 Separate Atmosphere. The atmosphere that exists between rooms, spaces, or areas that are separated by an approved smoke barrier.

3.3.8 Automatic. That which provides a function without the necessity of human intervention.

3.3.9 Barrier.

3.3.9.1* Smoke Barrier. A continuous membrane, or a membrane with discontinuities created by protected openings, where such membrane is designed and constructed to restrict the movement of smoke.

3.3.9.2* Thermal Barrier. A material that limits the average temperature rise of an unexposed surface to not more than 120°C (250°F) for a specified fire exposure complying with the standard time-temperature curve of NFPA 251, *Standard Methods of Tests of Fire Endurance of Building Construction and Materials*.

3.3.9.3 Fire Barrier (Wall). A wall, other than a fire wall, that has a fire resistance rating.

3.3.10* Birth Center. A facility in which low-risk births are expected following normal, uncomplicated pregnancies, and in which professional midwifery care is provided to women during pregnancy, birth, and postpartum.

3.3.11 Bleachers. A grandstand in which the seats are not provided with backrests.

3.3.12* Building. Any structure used or intended for supporting or sheltering any use or occupancy.

3.3.12.1* Apartment Building. A building containing three or more dwelling units with independent cooking and bathroom facilities.

3.3.12.2 Bulk Merchandising Retail Building. A building in which the sales area includes the storage of combustible materials on pallets, in solid piles, or in racks in excess of 3050 mm (120 in.) in storage height.

3.3.12.3* Covered Mall Building. A building, including the covered mall, enclosing a number of tenants and occupancies, such as retail stores, drinking and dining establishments, en-

tertainment and amusement facilities, offices, and other similar uses, wherein two or more tenants have a main entrance into the covered mall.

3.3.12.4* Existing Building. A building erected or officially authorized prior to the effective date of the adoption of this edition of the *Code* by the agency or jurisdiction.

3.3.12.5* Flexible Plan and Open Plan Educational or Day-Care Building. A building or portion of a building designed for multiple teaching stations.

3.3.12.6* High-Rise Building. A building greater than 23 m (75 ft) in height where the building height is measured from the lowest level of fire department vehicle access to the floor of the highest occupiable story.

3.3.12.7* Special Amusement Building. A building that is temporary, permanent, or mobile and contains a device or system that conveys passengers or provides a walkway along, around, or over a course in any direction as a form of amusement arranged so that the egress path is not readily apparent due to visual or audio distractions or an intentionally confounded egress path, or is not readily available due to the mode of conveyance through the building or structure.

3.3.13 Bulk Merchandising Retail Building. See 3.3.12.2.

3.3.14 Class A Mercantile Occupancy. All stores that have an aggregate gross area of more than 2800 m² (30,000 ft²) or that use more than three levels, excluding mezzanines, for sales purposes.

3.3.15* Class B Mercantile Occupancy. All stores of more than 280 m² (3000 ft²) but not more than 2800 m² (30,000 ft²) aggregate gross area, or that use floors above or below the street floor level for sales purposes.

3.3.16 Class C Mercantile Occupancy. All stores of not more than 280 m² (3000 ft²) gross area that use a maximum of one story or one story and mezzanines for sales purposes.

3.3.17* Common Path of Travel. The portion of exit access that must be traversed before two separate and distinct paths of travel to two exits are available.

3.3.18 Court. An open, uncovered, unoccupied space, unobstructed to the sky, bounded on three or more sides by exterior building walls.

3.3.18.1 Enclosed Court. A court bounded on all sides by the exterior walls of a building or by the exterior walls and lot lines on which walls are permitted.

3.3.19 Covered Mall. A covered or roofed interior area used as a pedestrian way and connected to a building(s) or portions of a building housing single or multiple tenants.

3.3.20 Covered Mall Building. See 3.3.12.3.

3.3.21 Day-Care Home. A building or portion of a building in which more than three but not more than twelve clients receive care, maintenance, and supervision, by other than their relative(s) or legal guardian(s), for less than 24 hours per day.

3.3.22 Detention and Correctional Residential Housing Area. Sleeping areas and any contiguous day room, group activity space, or other common spaces for customary access of residents.

3.3.23 Dwelling Unit. A single unit providing complete, independent living facilities for one or more persons, including

permanent provisions for living, sleeping, eating, cooking, and sanitation.

3.3.24* Electroluminescent. Having the property, emanating from a light-emitting capacitor, in which alternating current excites phosphor atoms placed between electrically conductive surfaces and produces light.

3.3.25 Elevator Evacuation System. A system, including a vertical series of elevator lobbies and associated elevator lobby doors, an elevator shaft(s), and a machine room(s), that provides protection from fire effects for elevator passengers, people waiting to use elevators, and elevator equipment so that elevators can be used safely for egress.

3.3.26 Elevator Lobby. A space from which people directly enter an elevator car(s) and to which people directly leave an elevator car(s).

3.3.27 Elevator Lobby Door. A door between an elevator lobby and another building space other than the elevator shaft.

3.3.28 Emergency Access Opening. A window, panel, or similar opening in which (1) the opening has dimensions of not less than 560 mm (22 in.) in width and 610 mm (24 in.) in height and is unobstructed to allow for ventilation and rescue operations from the exterior, (2) the bottom of the opening is not more than 1120 mm (44 in.) above the floor, (3) the opening is readily identifiable from both the exterior and interior, and (4) the opening is readily openable from both the exterior and interior.

3.3.29* Evacuation Capability. The ability of occupants, residents, and staff as a group either to evacuate a building or to relocate from the point of occupancy to a point of safety.

3.3.29.1 Impractical Evacuation Capability. The inability of a group to reliably move to a point of safety in a timely manner.

3.3.29.2 Prompt Evacuation Capability. The ability of a group to move reliably to a point of safety in a timely manner that is equivalent to the capacity of a household in the general population.

3.3.29.3 Slow Evacuation Capability. The ability of a group to move reliably to a point of safety in a timely manner, but not as rapidly as members of a household in the general population.

3.3.30 Exhibit. A space or portable structure used for the display of products or services.

3.3.31* Existing. That which is already in existence on the date when this edition of the *Code* goes into effect.

3.3.32* Exit. That portion of a means of egress that is separated from all other spaces of the building or structure by construction or equipment as required to provide a protected way of travel to the exit discharge.

3.3.32.1* Horizontal Exit. A way of passage from one building to an area of refuge in another building on approximately the same level, or a way of passage through or around a fire barrier to an area of refuge on approximately the same level in the same building that affords safety from fire and smoke originating from the area of incidence and areas communicating therewith.

3.3.33 Exit Access. That portion of a means of egress that leads to an exit.

3.3.34 Exit Discharge. That portion of a means of egress between the termination of an exit and a public way.

3.3.34.1 Level of Exit Discharge. (1) The lowest story from which not less than 50 percent of the required number of exits and not less than 50 percent of the required egress capacity from such a story discharge directly outside at grade; (2) the story with the smallest elevation change needed to reach grade where no story has 50 percent or more of the required number of exits and 50 percent or more of the required egress capacity from such a story discharge directly outside at grade.

3.3.35 Exposition. An event in which the display of products or services is organized to bring together the provider and user of the products or services.

3.3.36 Exposition Facility. See 3.3.38.1.

3.3.37 Externally Illuminated. See 3.3.62.1.

3.3.38 Facility.

3.3.38.1 Exposition Facility. A convention center, hotel, or other building at which exposition events are held.

3.3.38.2* Limited Care Facility. A building or portion of a building used on a 24-hour basis for the housing of four or more persons who are incapable of self-preservation because of age, physical limitations due to accident or illness, or limitations such as mental retardation/developmental disability, mental illness, or chemical dependency.

3.3.39 Family Day-Care Home. A day-care home in which more than three but fewer than seven clients receive care, maintenance, and supervision, by other than their relative(s) or legal guardian(s), for less than 24 hours per day.

3.3.40 Festival Seating. See 3.3.88.1.

3.3.41 Fire Barrier Wall. See 3.3.9.3.

3.3.42 Fire Exit Hardware. Labeled devices for swinging fire doors installed to facilitate safe egress of persons and generally consisting of a cross bar and various types of latch mechanisms that cannot hold the latch in a retracted locked position. [80:3.3]

3.3.43 Fire Protection Rating. See 3.3.86.1.

3.3.44 Fire Resistance Rating. See 3.3.86.2.

3.3.45 Flexible Plan and Open Plan Educational Occupancy or Day-Care Building. See 3.3.12.5.

3.3.46 Floor Area.

3.3.46.1* Gross Floor Area. The floor area within the inside perimeter of the outside walls of the building under consideration with no deduction for hallways, stairs, closets, thickness of interior walls, columns, or other features.

3.3.46.2 Net Floor Area. The floor area that is the actual occupied area, not including accessory unoccupied areas or thickness of walls.

3.3.47 General Industrial Occupancy. See 3.3.74.8.1.

3.3.48 Grandstand. A structure that provides tiered or stepped seating.

3.3.49 Gridiron. The structural framing over a stage, supporting equipment for hanging or flying scenery and other stage effects.

3.3.50 Gross Leasable Area. See 3.3.5.1.1.

3.3.51 Group Day-Care Home. A day-care home in which at least seven but not more than twelve clients receive care, maintenance, and supervision, by other than their relative(s) or legal guardian(s), for less than 24 hours per day.

3.3.52 Guard. A vertical protective barrier erected along exposed edges of stairways, balconies, and similar areas.

3.3.53 Guest Room. An accommodation combining living, sleeping, sanitary, and storage facilities within a compartment.

3.3.54 Guest Suite. An accommodation with two or more contiguous rooms comprising a compartment, with or without doors between such rooms, that provides living, sleeping, sanitary, and storage facilities.

3.3.55 Handrail. A bar, pipe, or similar member designed to furnish persons with a handhold.

3.3.56 Hazardous Area. See 3.3.5.1.2.

3.3.57 High-Hazard Industrial Occupancy. See 3.3.74.8.2.

3.3.58 High-Rise Building. See 3.3.12.6.

3.3.59 Horizontal Exit. See 3.3.32.1.

3.3.60 Hospital. A building or portion thereof used on a 24-hour basis for the medical, psychiatric, obstetrical, or surgical care of four or more inpatients.

3.3.61* Hotel. A building or groups of buildings under the same management in which there are sleeping accommodations for more than 16 persons and primarily used by transients for lodging with or without meals.

3.3.62 Illuminated.

3.3.62.1* Externally Illuminated. Having the property of emanating from a source that is contained outside of the device or sign legend area that is to be illuminated.

3.3.62.2* Internally Illuminated. Having the property of emanating from a source that is contained inside the device or legend that is illuminated.

3.3.63 Internally Illuminated. See 3.3.62.2.

3.3.64 Level of Exit Discharge. See 3.3.34.1.

3.3.65 Life Safety Evaluation. A written review dealing with the adequacy of life safety features relative to fire, storm, collapse, crowd behavior, and other related safety considerations.

3.3.66 Limited Care Facility. See 3.3.38.2.

3.3.67 Living Area. See 3.3.5.1.3.

3.3.68 Lodging or Rooming House. A building or portion thereof that does not qualify as a one- or two-family dwelling, that provides sleeping accommodations for a total of 16 or fewer people on a transient or permanent basis, without personal care services, with or without meals, but without separate cooking facilities for individual occupants.

3.3.69* Means of Egress. A continuous and unobstructed way of travel from any point in a building or structure to a public way consisting of three separate and distinct parts: (1) the exit access, (2) the exit, and (3) the exit discharge.

3.3.69.1 Accessible Means of Egress. A path of travel, usable by a person with a severe mobility impairment, that leads to a public way or an area of refuge.

3.3.70 Means of Escape. A way out of a building or structure that does not conform to the strict definition of *means of egress* but does provide an alternate way out.

3.3.71 Mobility Impairment (Severe). The ability to move to stairs but without the ability to use the stairs.

3.3.72 Multilevel Play Structure. See 3.3.103.1.

3.3.73 Nursing Home. A building or portion of a building used on a 24-hour basis for the housing and nursing care of four or more persons who, because of mental or physical incapacity, might be unable to provide for their own needs and safety without the assistance of another person.

3.3.74 Occupancy. The purpose for which a building or portion thereof is used or intended to be used.

3.3.74.1 Ambulatory Health Care Occupancy. A building or portion thereof used to provide services or treatment simultaneously to four or more patients that (1) provides, on an outpatient basis, treatment for patients that renders the patients incapable of taking action for self-preservation under emergency conditions without the assistance of others; or (2) provides, on an outpatient basis, anesthesia that renders the patients incapable of taking action for self-preservation under emergency conditions without the assistance of others.

3.3.74.2* Assembly Occupancy. An occupancy (1) used for a gathering of 50 or more persons for deliberation, worship, entertainment, eating, drinking, amusement, awaiting transportation, or similar uses; or (2) used as a special amusement building, regardless of occupant load.

3.3.74.3* Business Occupancy. An occupancy used for account and record keeping or the transaction of business other than mercantile.

3.3.74.4* Day-Care Occupancy. An occupancy in which four or more clients receive care, maintenance, and supervision, by other than their relatives or legal guardians, for less than 24 hours per day.

3.3.74.5* Detention and Correctional Occupancy. An occupancy used to house four or more persons under varied degrees of restraint or security where such occupants are mostly incapable of self-preservation because of security measures not under the occupants' control.

3.3.74.6* Educational Occupancy. An occupancy used for educational purposes through the twelfth grade by six or more persons for four or more hours per day or more than 12 hours per week.

3.3.74.7* Health Care Occupancy. An occupancy used for purposes of medical or other treatment or care of four or more persons where such occupants are mostly incapable of self-preservation due to age, physical or mental disability, or because of security measures not under the occupants' control.

3.3.74.8* Industrial Occupancy. An occupancy in which products are manufactured or in which processing, assembling, mixing, packaging, finishing, decorating, or repair operations are conducted.

3.3.74.8.1* General Industrial Occupancy An industrial occupancy in which ordinary and low hazard industrial operations are conducted in buildings of conventional design suitable for various types of industrial processes.

3.3.74.8.2* High-Hazard Industrial Occupancy. An industrial occupancy in which industrial operations that include high hazard materials, processes, or contents are conducted.

3.3.74.8.3 Special-Purpose Industrial Occupancy. An industrial occupancy in which ordinary and low hazard industrial operations are conducted in buildings 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.

3.3.74.9* Mercantile Occupancy. An occupancy used for the display and sale of merchandise.

3.3.74.10 Mixed Occupancy. An occupancy in which two or more classes of occupancy exist in the same building or structure and where such classes are intermingled so that separate safeguards are impracticable.

3.3.74.11* Residential Occupancy. An occupancy that provides sleeping accommodations for purposes other than health care or detention and correctional.

3.3.74.12* Residential Board and Care Occupancy. A building or portion thereof that is used for lodging and boarding of four or more residents, not related by blood or marriage to the owners or operators, for the purpose of providing personal care services.

3.3.74.12.1 Large Residential Board and Care Occupancy. A board and care occupancy that provides sleeping accommodations for more than 16 residents who receive personal care.

3.3.74.12.2 Small Residential Board and Care Occupancy. A board and care occupancy that provides sleeping accommodations for not more than 16 residents who receive personal care.

3.3.74.13* Storage Occupancy. An occupancy used primarily for the storage or sheltering of goods, merchandise, products, vehicles, or animals.

3.3.75 Occupant Load. The total number of persons that might occupy a building or portion thereof at any one time.

3.3.76 Occupiable Story. See 3.3.101.1.

3.3.77 Open Structure. See 3.3.103.2.

3.3.78 Open-Air Parking Structure. See 3.3.103.3.

3.3.79 Outside Stair. A stair with not less than one side open to the outside air.

3.3.80 Panic Hardware. A door-latching assembly incorporating a device that releases the latch upon the application of a force in the direction of egress travel.

3.3.81* Personal Care. The care of residents who do not require chronic or convalescent medical or nursing care.

3.3.82* Photoluminescent. Having the property of emitting light that continues for a length of time after excitation by visible or invisible light has been removed.

3.3.83 Point of Safety. A location that (a) is exterior to and away from a building; or (b) is within a building of any type construction protected throughout by an approved automatic sprinkler system and that is either (1) within an exit enclosure meeting the requirements of this *Code*, or (2) within another portion of the building that is separated by smoke barriers, with not less than a ½-hour fire resistance rating, and that portion of the building has access to a means of escape or exit

that conforms to the requirements of this *Code* and does not necessitate return to the area of fire involvement; or (c) is within a building of Type I, Type II(222), Type II(111), Type III(211), Type IV, or Type V(111) construction and is either (1) within an exit enclosure meeting the requirements of this *Code*, or (2) within another portion of the building that is separated by smoke barriers, with not less than a ½-hour fire resistance rating, and that portion of the building has access to a means of escape or exit that conforms to the requirements of this *Code* and does not necessitate return to the area of fire involvement.

3.3.84 Public Way. A street, alley, or other similar parcel of land essentially open to the outside air deeded, dedicated, or otherwise permanently appropriated to the public for public use and having a clear width and height of not less than 3 m (10 ft).

3.3.85 Ramp. A walking surface that has a slope steeper than 1 in 20.

3.3.86 Rating.

3.3.86.1 Fire Protection Rating. The time, in minutes or hours, that materials and assemblies used as opening protection have withstood a fire exposure as established in accordance with test procedures of NFPA 252, *Standard Methods of Fire Tests of Door Assemblies*, and NFPA 257, *Standard on Fire Test for Window and Glass Block Assemblies*, as applicable. [850:3.3]

3.3.86.2 Fire Resistance Rating. The time, in minutes or hours, that materials or assemblies have withstood a fire exposure as established in accordance with the test procedures of NFPA 251, *Standard Methods of Tests of Fire Endurance of Building Construction and Materials*.

3.3.87 Sally Port (Security Vestibule). A compartment provided with two or more doors where the intended purpose is to prevent continuous and unobstructed passage by allowing the release of only one door at a time.

3.3.88 Seating.

3.3.88.1* Festival Seating. A form of audience/spectator accommodation in which no seating, other than a floor or ground surface, is provided for the audience/spectators gathered to observe a performance.

3.3.88.2 Smoke-Protected Assembly Seating. Seating served by means of egress that is not subject to smoke accumulation within or under the structure.

3.3.89 Self-Closing. Equipped with an approved device that ensures closing after opening.

3.3.90* Self-Luminous. Illuminated by a self-contained power source and operated independently of external power sources.

3.3.91* Self-Preservation (Day-Care Occupancy). The ability of a client to evacuate a day-care occupancy without direct intervention by a staff member.

3.3.92 Separate Atmosphere. See 3.3.7.2.

3.3.93 Severe Mobility Impairment. See 3.3.7.1.

3.3.94 Smoke Barrier. See 3.3.9.1.

3.3.95* Smoke Compartment. A space within a building enclosed by smoke barriers on all sides, including the top and bottom.

3.3.96* Smoke Partition. A continuous membrane that is designed to form a barrier to limit the transfer of smoke.

3.3.97* Smokeproof Enclosure. A stair enclosure designed to limit the movement of products of combustion produced by a fire.

3.3.98 Smoke-Protected Assembly Seating. See 3.3.88.2.

3.3.99 Special Amusement Building. See 3.3.12.7.

3.3.100 Special-Purpose Industrial Occupancy. See 3.3.74.8.3.

3.3.101 Story. The portion of a building located between the upper surface of a floor and the upper surface of the floor or roof next above.

3.3.101.1* Occupiable Story. A story occupied by people on a regular basis. Stories used exclusively for mechanical equipment rooms, elevator penthouses, and similar spaces are not occupiable stories.

3.3.102* Street Floor. A story or floor level accessible from the street or from outside the building at ground level, with the floor level at the main entrance not more than three risers above or below ground level, and arranged and utilized to qualify as the main floor.

3.3.103* Structure. That which is built or constructed.

3.3.103.1 Multilevel Play Structure. A structure that consists of tubes, slides, crawling areas, and jumping areas, located within a building, and used for climbing and entertainment, generally by children.

3.3.103.2* Open Structure. A structure that supports equipment and operations not enclosed within building walls.

3.3.103.3 Open-Air Parking Structure. A structure used for the parking or storage of motor vehicles that have (1) uniformly distributed openings in exterior walls on not less than two sides totaling not less than 40 percent of the building perimeter, (2) aggregate areas of such openings in exterior walls in each level not less than 20 percent of the total perimeter wall area of each level, and (3) interior wall lines and columns not less than 20 percent open with openings distributed to allow ventilation.

3.3.103.4* Underground Structure. A structure or portions of a structure in which the floor level is below the level of exit discharge.

3.3.103.5 Water-Surrounded Structure. A structure fully surrounded by water.

3.3.103.6 Windowless Structure. A structure or portions of a structure lacking emergency access openings.

3.3.104 Thermal Barrier. See 3.3.9.2.

3.3.105 Tower. An enclosed independent structure or portion of a building with elevated levels for support of equipment or occupied for observation, control, operation, signaling, or similar limited use where (1) the elevated levels are provided to allow adequate observation or line-of-sight for personnel or equipment, and (2) the levels within the tower below the observation level and equipment room for that level are not occupied.

3.3.106 Underground Structure. See 3.3.103.4.

3.3.107 Use Condition I — Free Egress — Detention and Correctional Occupancy. Free movement is allowed from sleeping areas and other spaces where access or occupancy is per-

mitted to the exterior via means of egress that meet the necessary requirements.

3.3.108 Use Condition II — Zoned Egress — Detention and Correctional Occupancy. Free movement is allowed from sleeping areas and any other occupied smoke compartment to one or more other smoke compartments.

3.3.109 Use Condition III — Zoned Impeded Egress — Detention and Correctional Occupancy. Free movement is allowed within individual smoke compartments with egress impeded by remote-controlled release of means of egress from such smoke compartment to another smoke compartment.

3.3.110 Use Condition IV — Impeded Egress — Detention and Correctional Occupancy. Free movement is restricted from an occupied space. Remote-controlled release is provided to permit movement from all sleeping rooms, activity spaces, and other occupied areas within the smoke compartment to another smoke compartment.

3.3.111 Use Condition V — Contained — Detention and Correctional Occupancy. Free movement is restricted from an occupied space. Staff-controlled manual release at each door is provided to permit movement from all sleeping rooms, activity spaces, and other occupied areas within the smoke compartment to another smoke compartment.

3.3.112 Wall (Fire Barrier). See 3.3.9.3.

3.3.113 Water-Surrounded Structure. See 3.3.103.5.

3.3.114 Windowless Structure. See 3.3.103.6.

3.3.115 Yard. An open, unoccupied space, other than a court, unobstructed from the ground to the sky on the lot on which a building is situated.

Chapter 4 General

4.1 Mixed Occupancies.

4.1.1 Egress for Mixed Occupancies.

4.1.1.1 Where the means of egress of two or more classes of occupancy are intermingled in the same building or structure, the means of egress shall comply with the most restrictive requirements of the occupancies involved.

4.1.1.2 Where occupancies are separated by horizontal exits, egress through the horizontal exit shall not be the basis for designation as a mixed occupancy.

4.1.2 Special Mixed Occupancy Provisions for Health Care Occupancies.

4.1.2.1 All means of egress from health care occupancies that traverse non-health care spaces shall conform to the requirements of this *Code* for health care occupancies.

Exception: Egress through a horizontal exit into other contiguous occupancies that do not conform with health care egress provisions but that do comply with the requirements set forth in the appropriate occupancy chapter of this Code shall be permitted, provided the occupancy does not contain high-hazard contents. The horizontal exit shall comply with the requirements of 5.2.4.

4.1.2.2 Egress provisions for areas of health care facilities that correspond to other occupancies shall meet the corresponding requirements of this *Code* for such occupancies. Where the clinical needs of the occupant necessitate locking the means

of egress, staff shall be present for the supervised release of occupants during all times of use.

4.1.2.3 Non-health care related occupancies classified as containing high-hazard contents shall not be permitted in buildings housing health care occupancies.

4.1.3 Special Mixed Occupancy Provisions for Detention and Correctional Occupancies.

4.1.3.1 Egress provisions for areas of detention and correctional facilities that correspond to other occupancies shall meet the corresponding requirements of this *Code* for such occupancies. Where security operations necessitate locking the required means of egress, staff shall be present for the supervised release of occupants during all times of use.

4.1.3.2 All means of egress from detention and correctional occupancies that traverse other use areas shall conform, as a minimum, to the requirements of this *Code* for detention and correctional occupancies.

Exception: Egress through a horizontal exit into other contiguous occupancies that do not conform to detention and correctional occupancy egress provisions but that do comply with the requirements set forth in the appropriate occupancy chapter of this Code shall be permitted, provided the occupancy does not contain high-hazard contents. The horizontal exit shall comply with the requirements of 5.2.4.

4.1.3.3 Nondetention or noncorrectional related occupancies classified as containing high-hazard contents shall not be permitted in buildings housing detention or correctional occupancies.

4.1.4* Special Mixed Occupancy Provisions for Residential Occupancies.

4.1.4.1 No dwelling unit of a residential occupancy shall have its sole means of egress pass through any nonresidential occupancy in the same building.

Exception: Day-care homes within a dwelling unit.

4.1.4.2 No residential board and care occupancy shall have its sole means of egress pass through any nonresidential or non-health care occupancy in the same building.

4.1.4.3 No multiple dwelling unit of a residential occupancy shall be located above any nonresidential occupancy.

Exception No. 1: Where the dwelling unit of the residential occupancy and exits therefrom are separated from the nonresidential occupancy by construction having a fire resistance rating of not less than 1 hour.

Exception No. 2: Where the nonresidential occupancy is protected throughout by an approved, supervised automatic sprinkler system.

4.1.4.4 No residential board and care occupancy shall be located above any nonresidential or non-health care occupancy.

Exception: Where the residential board and care occupancy and exits therefrom are separated from the nonresidential or non-health care occupancy by construction having a fire resistance rating of not less than 2 hours.

4.2 Hazard of Contents.

4.2.1 General.

4.2.1.1 The hazard of contents, 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, and the danger of explosion or other occurrence potentially endangering the lives and safety of the occupants of the building or structure.

4.2.1.2 Hazard of contents shall be determined by the authority having jurisdiction on the basis of the character of the contents and the processes or operations conducted in the building or structure.

4.2.1.3 Where different degrees of hazard of contents exist in different parts of a building or structure, the most hazardous shall govern the classification for the purpose of this *Code* unless hazardous areas are separated or protected as required by the building code.

4.2.2 Classification of Hazard of Contents.

4.2.2.1 General. The hazard of contents of any building or structure shall be classified as low, ordinary, or high in accordance with 4.2.2.2, 4.2.2.3, and 4.2.2.4.

4.2.2.2 Low Hazard. Low-hazard contents shall be classified as those of such low combustibility that no self-propagating fire therein can occur.

4.2.2.3* Ordinary Hazard. Ordinary-hazard contents shall be classified as those that are likely to burn with moderate rapidity or to give off a considerable volume of smoke.

4.2.2.4* High Hazard. High-hazard contents shall be classified as those that are likely to burn with extreme rapidity or from which explosions are likely. (*For means of egress requirements, see Section 5.11.*)

Chapter 5 New Construction

5.1* General.

5.1.1 Separation of Means of Egress.

5.1.1.1* Exit Access Corridors. Corridors used as exit access shall be separated from other parts of the building by walls having a minimum 1-hour fire resistance rating and doors having a minimum 20-minute fire protection rating unless otherwise specified by 5.1.1.1.1 through 5.1.1.1.9.

5.1.1.1.1 Assembly Occupancies.

(A) Corridor and lobby protection shall not be required where assembly rooms served by the corridor or lobby have at least 50 percent of their exit capacity discharging directly to the outside, independent of corridors and lobbies.

(B) Corridor and lobby protection shall not be required in buildings protected throughout by an approved, supervised automatic sprinkler system.

(C) Lobbies that serve only one assembly area and that meet the requirements for intervening rooms shall not be required to have a fire resistance rating. (*See 5.5.1.7.*)

5.1.1.1.2 Educational Occupancies.

(A) Corridor protection shall not be required where all spaces normally subject to student occupancy have at least one door opening directly to the outside or to an exterior exit access balcony or corridor.

(B) In buildings protected throughout by an approved, supervised automatic sprinkler system, corridor walls shall not be required to be rated, provided such walls, in conjunction with the openings therein and ceilings at which they terminate, resist the passage of smoke.

(C) Toilet rooms shall not be required to be separated from corridors, provided they are separated from all other spaces by walls having not less than a 1-hour fire resistance rating.

5.1.1.1.3 Health Care Occupancies.

(A)* **General.** Health care occupancy corridors shall be separated from all other areas by partitions complying with (B) through (E).

Exception No. 1: Spaces shall be permitted to be unlimited in area and open to the corridor under the following conditions:

- (1) *The spaces are not used for patient sleeping rooms, treatment rooms, or hazardous areas.*
- (2) *The corridors onto which the spaces open in the same smoke compartment are protected by an electrically supervised, automatic smoke detection system, or the smoke compartment in which the space is located is protected throughout by quick-response sprinklers.*
- (3) *The open space is protected by an electrically supervised, automatic smoke detection system, or the entire space is arranged and located to permit direct supervision by the facility staff from a nurses' station or similar space.*
- (4) *The space does not obstruct access to required exits.*

Exception No. 2: Waiting areas shall be permitted to be open to the corridor under the following conditions:

- (1) *The aggregate waiting area in each smoke compartment does not exceed 55.7 m² (600 ft²).*
- (2) *Each area is protected by an electrically supervised, automatic smoke detection system, or each area is arranged and located to permit direct supervision by the facility staff from a nurses' station or similar space.*
- (3) *The area does not obstruct access to required exits.*

Exception No. 3: Space for nurses' stations shall be permitted to open to the corridor.

Exception No. 4: In a limited care facility, group meeting or multi-purpose therapeutic spaces shall be permitted to open to the corridor under the following conditions:

- (1) *The space is not a hazardous area.*
- (2) *The space is protected by an electrically supervised, automatic smoke detection system, or the space is arranged and located to permit direct supervision by the facility staff from the nurses' station or similar space.*
- (3) *The area does not obstruct access to required exits.*

(B)* **Construction of Health Care Occupancy Corridor Walls.** Corridor walls shall form a barrier to limit the transfer of smoke. Such walls shall be permitted to terminate at the ceiling where the ceiling is constructed to limit the transfer of smoke. A fire resistance rating shall not be required for corridor walls.

(C)* **Health Care Occupancy Corridor Doors.** Corridor doors in health care occupancies shall meet the following requirements:

- (1)* **Doors** protecting corridor openings shall be constructed to resist the passage of smoke. Doors to toilet rooms, bathrooms, shower rooms, sink closets, and similar auxiliary spaces that do not contain flammable or combustible materials shall be exempt from this requirement. Compliance with NFPA 80, *Standard for Fire Doors and Fire Windows*, shall not be required. Clearance between the bottom of the door and the floor covering not exceeding 25 mm (1 in.) shall be permitted for corridor doors.

- (2) Doors shall be provided with positive latching hardware. Doors to toilet rooms, bathrooms, shower rooms, sink closets, and similar auxiliary spaces that do not contain flammable or combustible materials shall be exempt from this requirement. Roller latches shall be prohibited.
- (3) Hold-open devices that release when the door is pushed or pulled shall be permitted.
- (4) Door-closing devices shall not be required on doors in corridor wall openings other than those serving required exits, smoke barriers, or enclosures of vertical openings and hazardous areas.
- (5) Nonrated, factory- or field-applied protective plates extending not more than 1220 mm (48 in.) above the bottom of the door shall be permitted.
- (6) Dutch doors shall be permitted where they conform to 5.1.1.1.3(C), where both upper leaf and lower leaf are equipped with a latching device, and where the meeting edges of the upper and lower leaves are equipped with an astragal, rabbet, or bevel.

(D) **Health Care Occupancy Corridor Transfer Grilles.** Transfer grilles, regardless of whether they are protected by fusible link-operated dampers, shall not be used in health care occupancy corridor walls or doors.

Exception: Doors to toilet rooms, bathrooms, shower rooms, sink closets, and similar auxiliary spaces that do not contain flammable or combustible materials shall be permitted to have ventilating louvers or to be undercut.

(E) **Health Care Occupancy Corridor Openings.** In other than smoke compartments containing patient bedrooms, miscellaneous openings such as mail slots, pharmacy pass-through windows, laboratory pass-through windows, and cashier pass-through windows shall be permitted to be installed in corridor vision panels or doors without special protection if the aggregate area of openings per room does not exceed 520 cm² (80 in.²) and the openings are installed at or below half the distance from the floor to the room ceiling.

5.1.1.1.4 Detention and Correctional Occupancies. See 5.5.1.26.

5.1.1.1.5 Residential Occupancies.

(A) In hotels, dormitories, or apartment buildings, in buildings protected throughout by an approved, supervised automatic sprinkler system, corridor walls shall have a minimum ½-hour fire resistance rating.

(B) In hotels, dormitories, or apartment buildings, spaces shall be permitted to be unlimited in area and open to the corridor under the following conditions:

- (1) The spaces are not used for guest rooms or guest suites, dwelling units, or hazardous areas.
- (2) The building is protected throughout by an approved, supervised automatic sprinkler system.
- (3) The space does not obstruct access to required exits.

(C) In lodging and rooming houses, all sleeping rooms shall be separated from escape route corridors by walls and doors that are smoke resistant. There shall be no louvers or operable transoms or other passages penetrating the wall except properly installed heating and utility installations other than transfer grilles. Transfer grilles shall be prohibited. Doors shall be provided with latches or other mechanisms suitable for keeping the doors closed. No doors shall be arranged to prevent the occupant from closing the door. In nonsprinklered build-

ings, doors shall be self-closing or automatic-closing upon detection of smoke.

5.1.1.1.6 Large Residential Board and Care Occupancy Means of Egress Corridors.

(A) Access shall be provided from every resident use area to at least one means of egress that is separated from all sleeping rooms by walls complying with (C) through (F).

(B) Sleeping rooms shall be separated from corridors, living areas, and kitchens by walls complying with (C) through (F).

(C) Walls required by (A) or (B) shall have a fire resistance rating of not less than ½ hour.

Exception: In conversions from an existing residential or health care occupancy to a residential board and care occupancy, no fire resistance rating shall be required, but the wall shall resist the passage of smoke.

(D) Doors in walls required by (A) or (B) shall have a fire protection rating of not less than 20 minutes. (See 7.2.1 for exemptions to these requirements.)

Exception: Walls without a fire resistance rating that are required only to resist the passage of smoke shall be permitted to have doors without a fire protection rating that resist the passage of smoke.

(E) Walls and doors required by (A) or (B) shall be constructed as smoke partitions in accordance with 5.13. The provisions of 5.13.3.5 shall not apply. There shall be no louvers, transfer grilles, operable transoms, or other air passages penetrating such walls or doors, except properly installed heating and utility installations.

(F) Doors to hazardous areas, vertical openings, exits, and exit passageways shall be self-closing or automatic-closing.

5.1.1.1.7 Mercantile and Business Occupancies.

(A) There shall be no requirements for corridor wall construction where exits are available from an open floor area.

(B) Corridors shall not be required within a space occupied by a single tenant.

(C) Corridors shall not be required within buildings protected throughout by an approved, supervised automatic sprinkler system.

5.1.1.1.8 Industrial and Storage Occupancies. There shall be no requirements for corridor wall construction.

5.1.1.1.9 Ambulatory Health Care Facilities. Pass-through windows and other miscellaneous openings shall be permitted to be installed in corridor vision panels or doors without special protection if the aggregate area of openings per room does not exceed 0.015 m² (0.14 ft²) and the openings are installed at or below half the distance from the floor to the room ceiling. For rooms protected throughout by an approved, supervised automatic sprinkler system, the aggregate area of openings per room shall not exceed 0.05 m² (0.55 ft²).

5.1.1.2 Exits.

5.1.1.2.1 Where an exit is required in this *Code* to be separated from other parts of the building, the separating construction shall meet the requirements in (A) through (F).

(A) The separation shall have not less than a 1-hour fire resistance rating where the exit connects three stories or less. Opening protectives shall have not less than a 1-hour fire protection rating.

(B) The separation shall have not less than a 2-hour fire resistance rating where the exit connects four or more stories. It shall be supported by construction having not less than a 2-hour fire resistance rating. Opening protectives shall have not less than a 1½-hour fire protection rating.

Exception: In hotels, dormitories, and apartment buildings protected throughout by an approved, supervised automatic sprinkler system, exit enclosures shall have a fire resistance rating of not less than 1 hour, and the fire protection rating of doors shall be not less than 1 hour.

(C) Openings therein shall be protected by fire door assemblies that are equipped with door closers that comply with 5.2.1.8.

(D)* Openings in exit enclosures shall be limited to those necessary for access to the enclosure from normally occupied spaces and corridors and for egress from the enclosure.

Exception: In covered mall buildings, rooms housing building service equipment, janitor closets, and service elevators shall be permitted to open directly onto exit passageways under the following conditions:

- (1) *The required fire resistance rating between such rooms or areas and the exit passageway shall be maintained in accordance with 5.1.1.2.*
- (2) *Such rooms or areas shall be protected by an approved, supervised automatic sprinkler system. The exceptions in NFPA 13, Standard for the Installation of Sprinkler Systems, that would permit the omission of sprinklers from such rooms shall not apply.*
- (3) *Service elevators opening into the exit passageway shall not open into areas other than exit passageways.*
- (4) *Where exit stair enclosures discharge into the exit passageway, Exception No. 2 to 5.2.1.5.3 shall not apply.*

(E) Penetrations into and openings through an exit enclosure assembly shall be prohibited except for electrical conduit serving the stairway, required exit doors, ductwork and equipment necessary for independent stair pressurization, water or steam piping necessary for the heating or cooling of the exit enclosure, sprinkler piping, and standpipes.

Exception: Penetrations for fire alarm circuits shall be permitted within enclosures where fire alarm circuits are installed in metallic conduit and penetrations are protected.

(F) Penetrations or communicating openings shall be prohibited between adjacent exit enclosures.

5.1.1.2.2 An exit enclosure shall provide a continuous protected path of travel to an exit discharge.

5.1.1.2.3* An exit enclosure shall not be used for any purpose that has the potential to interfere with its use as an exit and, if so designated, as an area of refuge. (See also 5.2.2.5.3.)

5.1.2* Headroom. Means of egress shall be designed and maintained to provide headroom as provided in other sections of this *Code* and shall be not less than 2285 mm (90 in.) with projections from the ceiling not less than 2030 mm (80 in.) nominal height above the finished floor. The minimum ceiling height shall be maintained for not less than two-thirds of the ceiling area of any room or space, provided the ceiling height of remaining ceiling area is not less than 2 m (6 ft 8 in.). Headroom on stairs shall be a minimum of 2030 mm (80 in.) and shall be measured vertically above a plane parallel to and tangent with the most forward projection of the stair tread.

Exception: Industrial equipment access walkways, platforms, ramps, and stairs that serve as a component of the means of egress from the involved equipment and do not serve more than 20 people shall be permitted a headroom of not less than 2030 mm (80 in.).

5.1.3 Walking Surfaces in the Means of Egress.

5.1.3.1 General. Walking surfaces in the means of egress shall comply with 5.1.3.2 through 5.1.3.4.

5.1.3.2 Changes in Elevation. Abrupt changes in elevation of walking surfaces shall not exceed 6.3 mm (¼ in.). Changes in elevation exceeding 6.3 mm (¼ in.) but not exceeding 13 mm (½ in.) shall be beveled 1 to 2. Changes in elevation exceeding 13 mm (½ in.) shall be considered a change in level and shall be subject to the requirements of 5.1.5. (*See 7.2.2 for exemption to these requirements.*)

5.1.3.3 Level. Walking surfaces shall be nominally level. The slope of a walking surface in the direction of travel shall not exceed 1 in 20 unless the ramp requirements of 5.2.5 are met. The slope perpendicular to the direction of travel shall not exceed 1 in 48. (*See 7.2.2 for exemption to these requirements.*)

5.1.3.4* Slip Resistance. Walking surfaces shall be slip resistant under foreseeable conditions. The walking surface of each element in the means of egress shall be uniformly slip resistant along the natural path of travel. (*See 7.2.2 for exemption to these requirements.*)

5.1.4 Changes in Level in Means of Egress.

5.1.4.1 Changes in level in means of egress shall be either by a ramp or by a stair if the elevation difference is more than 305 mm (12 in.).

5.1.4.2* Changes in level in means of egress not in excess of 305 mm (12 in.) shall be achieved either by a ramp or by a stair that complies with the requirements of 5.2.2. The presence and location of ramped portions of walkways shall be readily apparent. The tread depth of such stair shall be not less than 330 mm (13 in.), and the presence and location of each step shall be readily apparent.

Exception: Industrial equipment access stairs that serve as a component of the means of egress from the involved equipment and do not serve more than 20 people shall be permitted a tread depth of not less than 25.4 cm (10 in.).

5.1.5 Guards. Guards in accordance with 5.2.2.4 shall be provided at the open sides of means of egress that are more than 760 mm (30 in.) above the floor or the grade below.

5.1.6 Impediments to Egress. Any device or alarm installed to restrict the improper use of a means of egress shall be designed and installed so that it cannot, even in case of failure, impede or prevent emergency use of such means of egress.

Exception No. 1: Special locking arrangements for means of egress doors as specified in 5.2.1.6.

Exception No. 2: As provided for health care occupancies and detention and correctional occupancies in 5.2.1.

5.2 Means of Egress Components.

5.2.1 Doors.

5.2.1.1 General.

5.2.1.1.1 A door assembly shall be permitted in a means of egress. A door assembly in a means of egress shall conform to the general requirements of Section 5.1 and to the special

requirements of 5.2.1. Such an assembly shall be designated as a door.

5.2.1.1.2 Every door and every principal entrance that is required to serve as an exit shall be designed and constructed so that the path of egress travel is obvious and direct. Windows that, because of their physical configuration or design and the materials used in their construction, have the potential to be mistaken for doors shall be made inaccessible to the occupants by barriers or railings.

5.2.1.1.3* For the purposes of Section 5.2, a building shall be considered to be occupied at any time it is open for general occupancy, open to the public, or at any other time it is occupied by more than 10 persons.

5.2.1.2 Width.

5.2.1.2.1* Egress Capacity Width. In determining the egress width for swinging doors for purposes of calculating capacity, only the clear width of the doorway when the door is open 90 degrees shall be measured. In determining the egress width for other types of doors for purposes of calculating capacity, only the clear width of the doorway when the door is in the full open position shall be measured. Clear width of doorways shall be measured between the face of the door and the stop in accordance with 5.3.2. (*See 7.2.3 for exemption to these requirements.*)

5.2.1.2.2* Minimum Width Measurement. For purposes of determining minimum door width, the door leaf width shall be used unless clear width is specified. Where clear width is specified, there shall be no projections into the required clear door opening width, measured in accordance with 5.2.1.2.1, lower than 865 mm (34 in.) above the floor or ground. Projections into the required clear door opening width that are not less than 865 mm (34 in.) but that do not exceed 2030 mm (80 in.) above the floor or ground shall be limited to the hinge side of each door opening and shall not exceed 100 mm (4 in.). Projections exceeding 2030 mm (80 in.) above the floor or ground shall not be limited.

5.2.1.2.3 Door openings in means of egress shall be not less than 810 mm (32 in.) in clear width. Where a pair of doors is provided, at least one of the doors shall provide not less than a 810 mm (32 in.) clear width opening.

Exception No. 1: Exit access doors serving a room not larger than 6.5 m² (70 ft²) and not required to be accessible to persons in wheelchairs shall be not less than 610 mm (24 in.) in door width.

Exception No. 2: Doors serving a building or portion thereof not required to be accessible to persons with severe mobility impairments shall be permitted to be 710 mm (28 in.) in door leaf width.

Exception No. 3: In detention and correctional occupancies, door openings to resident sleeping rooms shall be not less than 710 mm (28 in.) in clear width.

Exception No. 4: Doors within dwelling units shall be not less than 710 mm (28 in.) wide, except bathroom doors shall be not less than 610 mm (24 in.) wide.

Exception No. 5: A power-operated door leaf located within a two-leaf opening shall be exempt from the minimum 810-mm (32-in.) single-leaf requirement in accordance with Exception No. 2 to 5.2.1.9.1.

Exception No. 6: This requirement shall not apply to revolving doors as provided in 5.2.1.10.

5.2.1.2.4 In health care occupancies, the minimum clear width for doors in the means of egress from sleeping rooms;

diagnostic and treatment areas such as X-ray, surgery, or physical therapy; and nursery rooms shall be as required in (A) and (B).

(A) In hospitals and nursing homes, the minimum clear width for doors in the means of egress from the areas required in 5.2.1.2.4 shall be 1055 mm (41.5 in.).

(B) In psychiatric hospitals and limited care facilities, the minimum clear width for doors in the means of egress from the areas required in 5.2.1.2.4 shall be 810 mm (32 in.).

Exception No. 1: Doors that are located so as not to be subject to use by any health care occupant shall be not less than 810 mm (32 in.) in clear width.

Exception No. 2: Doors in exit stair enclosures shall be not less than 810 mm (32 in.) in clear width.

Exception No. 3: Doors serving newborn nurseries shall be not less than 810 mm (32 in.) in clear width.

Exception No. 4: Where a pair of doors is provided, at least one of the doors shall provide not less than a 810-mm (32-in.) clear width opening and a rabbet, bevel, or astragal shall be provided at the meeting edge. The inactive leaf shall have an automatic flush bolt to provide positive latching.

5.2.1.3 Floor Level. The elevation of the floor surfaces on both sides of a door shall not vary by more than 13 mm (½ in.). The elevation shall be maintained on both sides of the doorway for a distance not less than the width of the widest leaf. Thresholds at doorways shall not exceed 13 mm (½ in.) in height. Raised thresholds and floor level changes in excess of 6.3 mm (¼ in.) at doorways shall be beveled with a slope not steeper than 1 in 2. (See 7.2.4 for exemption to these requirements.)

Exception No. 1: In one- and two-family dwellings where the door discharges to the outside or to an exterior balcony or exterior exit access, the floor level outside the door shall be permitted to be one step lower than the inside but shall not be in excess of 205 mm (8 in.) lower.

Exception No. 2: In one- and two-family dwellings, a door at the top of a stair shall be permitted to open directly at a stair, provided that the door does not swing over the stair and the door serves an area with an occupant load of fewer than 50 persons.

5.2.1.4 Swing and Force to Open.

5.2.1.4.1* Any door in a means of egress shall be of the side-hinged or pivoted-swinging type. The door shall be designed and installed so that it is capable of swinging from any position to the full required width of the opening in which it is installed.

Exception No. 1: In detention and correctional occupancies, doors in a means of egress shall be permitted to be of the horizontal sliding type if the force to slide the door to its fully open position does not exceed 222 N (50 lbf) with a perpendicular force against the door of 222 N (50 lbf).

Exception No. 2: Within dwelling units, doors shall be swinging or sliding.

Exception No. 3: Security grilles as specified in 5.2.1.4.2 shall be permitted.

Exception No. 4: In large residential board and care occupancies, doors within individual rooms and suites of rooms shall be permitted to be swinging or sliding.

Exception No. 5: Horizontal sliding doors that comply with 5.2.1.14 shall be permitted.

Exception No. 6: Doors to private garages and business industrial and storage areas with an occupant load of not more than 10, where such garages and business industrial and storage areas contain low- or ordinary-hazard contents, shall be permitted.

Exception No. 7: Revolving doors that comply with 5.2.1.10 shall be permitted.

5.2.1.4.2 Horizontal sliding or vertical rolling security grilles or doors that are part of the required means of egress shall be permitted for the occupancies shown in Table 5.2.1.4.2 under the following conditions:

- (1) They remain secured in the full open position during the period of occupancy by the general public.
- (2) On or adjacent to the door, there is a readily visible, durable sign in letters at least 25 mm (1 in.) high on a contrasting background that reads as follows: THIS DOOR TO REMAIN OPEN WHEN THE BUILDING IS OCCUPIED.
- (3) Doors or grilles are not brought to the closed position when the space is occupied.
- (4) Doors or grilles are operable from within the space without the use of any special knowledge or effort.
- (5) Where two or more means of egress are required, not more than half of the means of egress is equipped with horizontal sliding or vertical rolling grilles or doors.

Table 5.2.1.4.2 Occupancies Permitting Sliding or Rolling Security Grilles or Doors

Occupancy	Conditions
Assembly	Main entrance/exits of assembly occupancies with occupant loads of 300 or fewer in covered mall buildings
Mercantile	From tenant spaces
Business	From tenant spaces

5.2.1.4.3 Doors that are required to be of the side-hinged or pivoted-swinging type shall swing in the direction of egress travel if serving a room or area with an occupant load of 50 or more.

5.2.1.4.4 Doors shall swing in the direction of egress travel if used in an exit enclosure or if serving a high-hazard contents area.

Exception: Doors from individual living units that open directly into an exit enclosure.

5.2.1.4.5* During its swing, any door in a means of egress shall leave unobstructed not less than one-half of the required width of an aisle, corridor, passageway, or landing and shall not project more than 180 mm (7 in.) into the required width of an aisle, corridor, passageway, or landing when fully open. Doors shall not open directly onto a stair without a landing. The landing shall have a width not less than the width of the door. (See 5.2.1.3. See also 7.2.5 for exemptions to these requirements.)

5.2.1.4.6 In educational occupancies, doors that swing into an exit access corridor shall be recessed to prevent interference with corridor traffic. (See also 5.2.1.4.5.)

5.2.1.4.7 The forces required to fully open any door manually in a means of egress shall not be more than 67 N (15 lbf) to release the latch, 133 N (30 lbf) to set the door in motion,

and 67 N (15 lbf) to open the door to the minimum required width. Opening forces for interior side-hinged or pivoted-swinging doors without closers shall not be more than 22 N (5 lbf). These forces shall be applied at the latch stile.

Exception No. 1: Horizontal sliding doors in detention and correctional occupancies as specified in Exception No. 1 to 5.2.1.4.1.

Exception No. 2: Power-operated doors as specified in 5.2.1.9.

5.2.1.5 Locks, Latches, and Alarm Devices.

5.2.1.5.1 Doors shall be arranged to be opened readily from the egress side whenever the building is occupied. Locks, if provided, shall not require the use of a key, a tool, or special knowledge or effort for operation from the egress side of the building.

Exception No. 1: On patient sleeping room doors, in health care occupancies, locking devices that restrict access to the room from the corridor and that are operable only by staff from the corridor side shall be permitted. Such devices shall not restrict egress from the room. Only one such locking device shall be permitted on each door.

Exception No. 2: Door-locking arrangements shall be permitted in health care occupancies or portions of health care occupancies where the clinical needs of the patients require specialized security measures for their safety if keys are carried by staff at all times. Only one such locking device shall be permitted on each door.

Exception No. 3: Key-operated locks as specified in 5.2.1.5.2 shall be permitted.

Exception No. 4: In lodging or rooming houses, doors serving a single dwelling unit only shall be permitted to be key operated if the key cannot be removed when the door is locked from the side from which egress is to be made.

Exception No. 5: In detention and correctional occupancies, doors shall be permitted to be locked in accordance with the applicable use condition. (See definitions of Use Conditions in Section 3.3; see also 5.2.1.6.3.)

5.2.1.5.2 Exterior doors for the occupancies shown in Table 5.2.1.5.2 shall be permitted to have key-operated locks from the egress side under the following conditions:

- (1) On or adjacent to the door, there is a readily visible, durable sign in letters not less than 25 mm (1 in.) high on a contrasting background that reads as follows: **THIS DOOR TO REMAIN OPEN WHEN THE BUILDING IS OCCUPIED.**
- (2) The locking device is of a type that is readily distinguishable as locked.
- (3) A key is immediately available to any occupant inside the building when it is locked. This provision shall be permitted to be revoked by the authority having jurisdiction for cause.

5.2.1.5.3* Every stair enclosure door shall permit reentry from the stair enclosure to the interior of the building, or an automatic release shall be provided to unlock all stair enclosure doors to permit reentry. Such automatic release shall be actuated with the initiation of the building fire alarm system.

Exception No. 1: Doors on stair enclosures shall be permitted to be equipped with hardware that prevents reentry into the interior of the building, provided the following conditions are met:

- (1) *There are at least two levels where it is possible to leave the stair enclosure.*

Table 5.2.1.5.2 Occupancies Permitting Key-Operated Locks

Occupancy	Condition
Assembly	Main entrance/exits consisting of single door or single pair of doors in assembly occupancies with occupant loads of 500 or fewer
Mercantile	Principal entrance/exit doors
Business	Principal entrance/exit doors

- (2) *There are not more than four stories intervening between stories where it is possible to leave the stair enclosure.*
- (3) *Reentry is possible on the top or next to top story, permitting access to another exit.*
- (4) *Doors permitting reentry are identified as such on the stair side of the door.*
- (5) *Doors not permitting reentry are provided with a sign on the stair side indicating the location of the nearest door, in each direction of travel, permitting reentry or exit.*

Exception No. 2: Stairs serving not more than four stories.

Exception No. 3: Stair enclosures serving a building permitted to have a single exit in accordance with the provisions of this chapter.

Exception No. 4: Non-high-rise health care occupancy buildings.

Exception No. 5: Detention and correctional occupancies.

5.2.1.5.4 If a stair enclosure allows access to the roof of the building, the door to the roof either shall be kept locked or shall allow reentry from the roof.

5.2.1.5.5* A latch or other fastening device on a door shall be provided with a releasing device that has an obvious method of operation and that is readily operated under all lighting conditions. The releasing mechanism for any latch shall be located not less than 865 mm (34 in.) and not more than 1220 mm (48 in.) above the finished floor. Doors shall be operable with not more than one releasing operation.

Exception: Egress doors from individual living units and guest rooms of residential occupancies shall be permitted to be provided with devices that require not more than one additional releasing operation if such device is operable from the inside without the use of a key or tool and is mounted at a height not exceeding 1220 mm (48 in.) above the finished floor. Automatic latching devices shall not be located more than 1220 mm (48 in.) above the finished floor.

5.2.1.5.6 Where pairs of doors are required in a means of egress, each leaf of the pair shall be provided with its own releasing device. Devices that depend on the release of one door before the other shall not be used.

Exception: Where exit doors are used in pairs and approved, automatic flush bolts are used, the door leaf having the automatic flush bolts shall have no doorknob or surface-mounted hardware. The unlatching of any leaf shall not require more than one operation.

5.2.1.5.7* Devices shall not be installed in connection with any door on which panic hardware or fire exit hardware is required if such device prevents or is intended to prevent the free use of the door for purposes of egress.

Exception: As otherwise provided in 5.2.1.6.

5.2.1.6 Special Locking Arrangements.

5.2.1.6.1 Delayed Egress Locks. In occupancies shown in Table 5.2.1.6.1, approved, listed, delayed egress locks shall be permitted to be installed on doors serving low- and ordinary-hazard contents in buildings protected throughout by an approved, supervised automatic fire detection system or an approved, supervised automatic sprinkler system, provided the criteria in (A) through (D) are met.

Table 5.2.1.6.1 Occupancies Permitting Delayed Egress Locks

Occupancy	Condition
Assembly	Doors other than main entrance/exit
Educational	—
Day care	—
Health care	Not more than one such device is located in any egress path
Ambulatory health care	Limited to exterior doors
Hotels and dormitories	Not more than one such device is located in any egress path
Apartment buildings	Not more than one such device is located in any egress path
Residential board and care, large	Not more than one such device is located in any egress path
Mercantile	—
Business	—
Industrial	—
Storage	—

(A) The doors shall unlock upon actuation of an approved, supervised automatic sprinkler system, or upon the actuation of any heat detector or activation of not more than two smoke detectors of an approved, supervised automatic fire detection system.

(B) The doors shall unlock upon loss of power controlling the lock or locking mechanism.

(C)* An irreversible process shall release the lock within 15 seconds upon activation of a force to the release device required in 5.2.1.5.5. The force to initiate the lock-releasing process shall not have to be applied continuously for more than 3 seconds. The force applied to initiate the lock-releasing process shall not have to exceed 67 N (15 lbf). The initiation of the release process shall activate an audible signal in the vicinity of the door. Once the door lock has been released by the application of force to the releasing device, relocking shall be by manual means only.

Exception: Where approved by the authority having jurisdiction, a delay of not more than 30 seconds shall be permitted.

(D)* On the door adjacent to the release device, there shall be a readily visible, durable sign in letters not less than 25 mm (1 in.) high and not less than 3.2 mm (1/8 in.) in stroke width on a contrasting background that reads as follows: PUSH UNTIL ALARM SOUNDS. DOOR CAN BE OPENED IN 15 SECONDS.

5.2.1.6.2 Access-Controlled Egress Doors. In occupancies shown in Table 5.2.1.6.2, doors in the means of egress shall be permitted to be equipped with an approved entrance and

egress access control system, provided the following criteria are met:

- (1) A sensor, arranged to detect an occupant approaching the doors, shall be provided on the egress side, and the doors shall be arranged to unlock in the direction of egress upon detection of an approaching occupant or loss of power to the sensor.
- (2) Loss of power to that part of the access control system that locks the doors shall automatically unlock the doors in the direction of egress.
- (3) The doors shall be arranged to unlock in the direction of egress from a manual release device located 1015 mm (40 in.) to 1220 mm (48 in.) vertically above the floor and within 1525 mm (60 in.) of the secured doors. The manual release device shall be readily accessible and clearly identified by a sign that reads as follows: PUSH TO EXIT. When operated, the manual release device shall result in direct interruption of power to the lock — independent of the access control system electronics — and the doors shall remain unlocked for at least 30 seconds.
- (4) Activation of the building fire-protective signaling system, if provided, shall automatically unlock the doors in the direction of egress, and the doors shall remain unlocked until the fire-protective signaling system has been manually reset.
- (5) Activation of the building automatic sprinkler or fire detection system, if provided, shall automatically unlock the doors in the direction of egress, and the doors shall remain unlocked until the fire-protective signaling system has been manually reset.

Table 5.2.1.6.2 Occupancies Permitting Access-Controlled Egress Doors

Occupancy	Condition
Assembly	Doors not locked from egress side when assembly occupancy is occupied
Educational	—
Day care	—
Health care	—
Ambulatory health care	Limited to exterior doors
Hotels and dormitories	—
Apartment buildings	—
Residential board and care, large	—
Mercantile	In buildings protected throughout by an approved, supervised fire detection system or an approved, automatic sprinkler system
Business	—
Industrial	—
Storage	—

5.2.1.6.3* Locking Provisions for Detention and Correctional Occupancies.

5.2.1.6.3.1 Doors from areas of refuge to the exterior shall be permitted to be locked with key locks in lieu of locking meth-

ods described in 5.2.1.6.3.2. The keys to unlock such doors shall be maintained and available at the facility at all times, and the locks shall be operable from the outside.

5.2.1.6.3.2* Any remote-controlled release used in a means of egress shall be provided with a reliable means of operation, remotely located from the resident living areas, to release locks on all doors. The remote location shall have sight and sound supervision of the resident living areas.

Exception: Provisions for remote-controlled locking and unlocking of occupied rooms in Use Condition IV shall not be required, provided that not more than 10 locks are necessary to be unlocked in order to move all occupants from one smoke compartment to an area of refuge as promptly as required to relocate occupants when remote-controlled unlocking is used. Unlocking of all necessary locks shall be accomplished with not more than two separate keys. (See 5.13.3 for requirements for smoke barrier doors.)

5.2.1.6.3.3 All remote-controlled release-operated doors shall be provided with a redundant means of operation as follows:

- (1) Power-operated sliding doors or power-operated locks shall be constructed so that, in the event of a power failure, a manual mechanical means to release and open the doors is provided at each door, and either emergency power arranged in accordance with 5.9.2.2 is provided for the power operation or a remote-controlled manual mechanical release is provided.
- (2) Mechanically operated sliding doors or mechanically operated locks shall be provided with a manual mechanical means at each door to release and open the door.

5.2.1.6.3.4 Doors unlocked by means of remote control under emergency conditions shall not automatically relock when closed unless specific action is taken at the remote-control location to enable doors to relock.

5.2.1.6.3.5 Emergency power shall be provided for all electrically operated sliding doors and locks. Power shall be arranged to automatically operate within 10 seconds of failure of normal power and to maintain the necessary power source for a minimum of 1½ hours.

Exception: This provision shall not be applicable for facilities with 10 or fewer locks that comply with the exception to 5.2.1.6.3.2.

5.2.1.7 Panic Hardware and Fire Exit Hardware.

5.2.1.7.1 In the occupancies shown in Table 5.2.1.7.1, doors shall be equipped with panic or fire exit hardware. Such a releasing device shall meet the following criteria:

- (1) It shall consist of cross bars or push pads, the actuating portion of which extends across not less than one-half of the width of the door leaf and not less than 865 mm (34 in.) nor more than 1220 mm (48 in.) above the floor. *(See 7.2.6 for exemption to this requirement.)*
- (2) It shall be constructed so that a horizontal force not exceeding 67 N (15 lbf) actuates the cross bar or push pad and latches.

5.2.1.7.2 Only approved panic hardware shall be used on doors that are not fire doors. Only approved fire exit hardware shall be used on fire doors.

5.2.1.7.3 Required panic hardware and fire exit hardware shall not be equipped with any locking device, set screw, or other arrangement that prevents the release of the latch when pressure is applied to the releasing device. Devices that hold

Table 5.2.1.7.1 Occupancies Requiring Panic Hardware or Fire Exit Hardware

Occupancy	Condition
Assembly	Any latching or locking door in means of egress from area having an occupant load of 100 or more persons
Educational	Any latching or locking door in means of egress from area having an occupant load of 100 or more persons
Day care	Any latching or locking door in means of egress from area having an occupant load of 100 or more persons
Any occupancy	Any door serving high-hazard contents area with an occupant load of 5 or more persons

the latch in the retracted position shall be prohibited on fire exit hardware.

Exception No. 1: Doors that are permitted to be locked in detention and correctional occupancies shall be permitted to be equipped with devices that prevent the release of the latch.

Exception No. 2: Listed and approved devices that hold the latch in the retracted position shall be permitted on fire exit hardware.

5.2.1.8 Self-Closing Devices.

5.2.1.8.1* A door normally required to be kept closed shall not be secured in the open position at any time and shall be self-closing or automatic-closing in accordance with 5.2.1.8.2.

5.2.1.8.2 In any building of low- or ordinary-hazard contents, as defined in Section 4.2, or where approved by the authority having jurisdiction, doors shall be permitted to be automatic-closing, provided the following criteria are met:

- (1) Upon release of the hold-open mechanism, the door becomes self-closing.
- (2) The release device is designed so that the door instantly releases manually and upon release becomes self-closing, or the door readily closes.
- (3) The automatic releasing mechanism or device is activated by the operation of approved smoke detectors installed in accordance with the requirements for smoke detectors for door release service in *NFPA 72, National Fire Alarm Code®*. *(See 7.2.7 for an exemption to this requirement.)*
- (4) Upon loss of power to the hold-open device, the hold-open mechanism is released and the door becomes self-closing.
- (5) The release by means of smoke detection of one door in a stair enclosure results in the closing of all doors serving that stair.
- (6) In health care occupancies, the automatic sprinkler system, the fire alarm system, and the systems listed in (3) are arranged to initiate the closing action of all such doors throughout the smoke compartment or throughout the entire facility.
- (7) In ambulatory health care facilities, the systems listed in (3) are arranged to initiate the closing action of all such doors by zone or throughout the entire facility.

5.2.1.9 Powered Doors.

5.2.1.9.1* General. Where means of egress doors are operated by power upon the approach of a person or where doors are

equipped with power-assisted manual operation, the design shall be such that, in the event of power failure, the door opens manually to allow egress travel or closes where necessary to safeguard the means of egress. The forces required to open these doors manually shall not exceed those required in 5.2.1.4.7, except that the force required to set the door in motion shall not be more than 222 N (50 lbf). The door shall be designed and installed so that, when a force is applied to the door on the side from which egress is made, it shall be capable of swinging from any position to the full use of required width of the opening in which it is installed. (See 5.2.1.4.) On the egress side of each door, there shall be a readily visible, durable sign that reads as follows: IN EMERGENCY, PUSH TO OPEN. The sign shall be in letters not less than 25 mm (1 in.) high on a contrasting background.

Exception No. 1: In an exit access that serves an occupant load of fewer than 50, sliding, power-operated doors that manually open in the direction of door travel with forces not exceeding those required in 5.2.1.4.7 shall not be required to have a swing-out feature. The required sign shall read as follows: IN EMERGENCY, PUSH TO OPEN.

Exception No. 2: In the emergency break-out mode, a door leaf located within a two-leaf opening shall be exempt from the minimum 810-mm (32-in.) single-leaf requirement of 5.2.1.2.3 if the clear width of the single leaf is at least 760 mm (30 in.).

Exception No. 3: For a bi-parting sliding door in the emergency break-out mode, a door leaf located within a multiple-leaf opening shall be exempt from the minimum 810-mm (32-in.) single-leaf requirement of 5.2.1.2.3 if a clear opening of not less than 810-mm (32-in.) is provided by all leaves broken out.

Exception No. 4: Doors complying with 5.2.1.14 shall be permitted to be used.

Exception No. 5: Power-operated doors as permitted in detention and correctional occupancies.

5.2.1.9.2 Doors Required to Be Self-Closing. Where doors are required to be self-closing and (1) are operated by power upon the approach of a person or (2) are provided with power-assisted manual operation, they shall be permitted in the means of egress under the following conditions:

- (1) Doors can be opened manually in accordance with 5.2.1.9.1 to allow egress travel in the event of power failure.
- (2) New doors remain in the closed position unless actuated or opened manually.
- (3) When actuated, new doors remain open for not more than 30 seconds.
- (4) Doors are held open for any period of time close — and the power-assist mechanism ceases to function — upon operation of approved smoke detectors installed in such a way as to detect smoke on either side of the door opening in accordance with the provisions of NFPA 72, *National Fire Alarm Code*.
- (5) Doors required to be self-latching are either self-latching or become self-latching upon operation of approved smoke detectors per 5.2.1.9.2(4).
- (6) New power-assisted swinging doors comply with BHMA/ANSI A156.19, *American National Standard for Power Assist and Low Energy Power Operated Doors*.

5.2.1.10 Revolving Doors.

5.2.1.10.1 Revolving doors shall comply with (A) through (E).

(A) Revolving doors shall be capable of being collapsed into a book-fold position.

(B) When in the book-fold position, the parallel egress paths formed shall provide an aggregate width of 915 mm (36 in.).

(C) Revolving doors shall not be used within 3050 mm (120 in.) of the foot or top of stairs or escalators. Under all conditions, there shall be a dispersal area acceptable to the authority having jurisdiction between the stairs or escalators and the revolving door.

(D) The revolutions per minute (rpm) of revolving doors shall not exceed those shown in Table 5.2.1.10.1.

Table 5.2.1.10.1 Speed Limitations of Revolving Door Revolution

Inside Diameter		Power Driven-Type Speed Control (rpm)	Manual-Type Speed Control (rpm)
mm	in.		
1980	78	11	12
2135	84	10	11
2285	90	9	11
2440	96	9	10
2590	102	8	9
2745	108	8	9
2895	114	7	8
3050	120	7	8

(E) Each revolving door shall have a conforming side-hinged swinging door in the same wall as the revolving door and within 3050 mm (120 in.) of the revolving door.

Exception: Revolving doors shall be permitted 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 if the lobby has no occupancy other than as a means of travel between elevators and street.

5.2.1.10.2 In assembly, hotel and dormitory, apartment building, large residential board and care, mercantile, and business occupancies, revolving doors shall be permitted as a component in a means of egress under the following conditions:

- (1) Revolving doors are not given credit for more than 50 percent of the required egress capacity.
- (2) Each revolving door is credited with not more than a 50-person capacity.
- (3) Revolving doors with not less than 2745-mm (108-in.) in diameter is credited with an egress capacity based on the clear opening width created when the door is collapsed into a book-fold position.
- (4) Revolving doors are capable of being collapsed into a book-fold position when a force of not more than 580 N (130 lbf) is applied to wings within 75 mm (3 in.) of the outer edge.

5.2.1.10.3 Revolving doors that are not used as a component of a means of egress shall have a collapsing force of not more than 800 N (180 lbf).

Exception: Revolving doors, provided that the collapsing force is reduced to not more than 580 N (130 lbf) under the following conditions:

- (1) Power to the device holding the wings in position fails or is removed.

- (2) There is actuation of the automatic sprinkler system where such a system is provided.
- (3) There is actuation of a smoke detection system that is installed to provide coverage in all areas within the building that are within 23 m (75 ft) of the revolving doors.
- (4) There is actuation of a clearly identified manual control switch in an approved location that reduces the holding force to not more than 580 N (130 lbf).

5.2.1.11 Turnstiles.

5.2.1.11.1 Turnstiles or similar devices that restrict travel to one direction or are used to collect fares or admission charges shall not be placed so as to obstruct any required means of egress.

Exception No. 1: Approved turnstiles not exceeding 990 mm (39 in.) high that turn freely in the direction of egress travel shall be permitted where revolving doors are permitted in 5.2.1.10.2.

Exception No. 2: Where turnstiles are approved by the authority having jurisdiction, each turnstile shall be credited for a capacity of 50 persons, provided such turnstiles meet the following criteria:

- (1) Each turnstile freewheels in the egress direction when primary power is lost and freewheels in the direction of egress travel upon the manual release by an employee assigned in the area
- (2) Each turnstile is not given credit for more than 50 percent of the required egress width
- (3) Each turnstile is not more than 990 mm (39 in.) high and has a clear width of at least 420 mm (16½ in.)

5.2.1.11.2 Turnstiles exceeding 990 mm (39 in.) high shall meet the requirements for revolving doors.

5.2.1.11.3 Turnstiles in or furnishing access to required exits shall provide not less than 420 mm (16½ in.) clear width at and below a height of 990 mm (39 in.) and not less than 560 mm (22 in.) clear width at heights above 990 mm (39 in.).

5.2.1.12 Doors in Folding Partitions. Where permanently mounted folding or movable partitions divide a room into smaller spaces, a swinging door or open doorway shall be provided as an exit access from each such space.

Exception No. 1: A door or opening in the folding partition shall not be required under the following conditions:

- (1) The subdivided space is not used by more than 20 persons at any time.
- (2) The use of the space is under adult supervision.
- (3) The partitions are arranged so that they do not extend across any aisle or corridor used as an exit access to the required exits from the story.
- (4) The partitions conform to the interior finish and other requirements of this Code.
- (5) The partitions are of an approved type, have a simple method of release, and are capable of being opened quickly and easily by experienced persons in case of emergency.

Exception No. 2: Where a subdivided space is provided with at least two means of egress, the swinging door in the folding partition shall not be required, and one such means of egress shall be permitted to be equipped with a horizontal sliding door that complies with 5.2.1.14.

5.2.1.13 Balanced Doors. If panic hardware is installed on balanced doors, the panic hardware shall be of the push-pad type, and the pad shall not extend more than approximately one-half the width of the door measured from the latch side. [See 5.2.1.7.1(1).]

5.2.1.14 Horizontal Sliding Doors.

5.2.1.14.1 Horizontal sliding doors shall be permitted in means of egress under the following conditions:

- (1) The door is readily operable from either side without special knowledge or effort.
- (2) The force, applied to the operating device in the direction of egress, required to operate the door is not more than 67 N (15 lbf).
- (3) The force required to operate the door in the direction of door travel is not more than 133 N (30 lbf) to set the door in motion and not more than 67 N (15 lbf) to close the door or open it to the minimum required width.
- (4) The door is operable with a force not more than 222 N (50 lbf) when a force of 1110 N (250 lbf) is applied perpendicularly to the door adjacent to the operating device.
- (5) The door assembly complies with the fire protection rating and, where rated, is self-closing or automatic-closing by smoke detection in accordance with 5.2.1.8.
- (6) In apartment buildings, hotels, and dormitories, horizontal sliding doors shall not be used across corridors.

5.2.1.14.2 In health care occupancies, horizontal sliding doors, as permitted by 5.2.1.14.1, that are not automatic-closing shall be limited to a single leaf and shall have a latch or other mechanism that ensures that doors will not rebound into a partially open position when closed.

5.2.2 Stairs.

5.2.2.1 General. Stairs shall be permitted in the means of egress. Stairs used in the means of egress shall conform to the general requirements of Section 5.1 and to the special requirements of 5.2.2.

Exception: Aisle steps in assembly occupancies as specified in 5.15.4.

5.2.2.2 Dimensional Criteria.

5.2.2.2.1 Standard Stairs. Stairs shall be in accordance with Table 5.2.2.2.1. (See 7.2.8 for exemption to this requirement.)

Table 5.2.2.2.1 Stair Criteria

Element	Dimension
Minimum width clear of all obstructions, except projections not exceeding 90 mm (3½ in.) at or below handrail height on each side	1120 mm (44 in.); 915 mm (36 in.) where total occupant load of all stories served by stairways is fewer than 50
Maximum height of risers	180 mm (7 in.)
Minimum height of risers	100 mm (4 in.)
Minimum tread depth	280 mm (11 in.)
Minimum headroom	2030 mm (80 in.)
Maximum height between landings	3660 mm (144 in.)
Landing	(See 5.2.1.3 and 5.2.2.3.2.)

Exception No. 1: Industrial equipment access stairs and landings that serve as a component of the means of egress from the involved equipment and do not serve more than 20 people shall be permitted to have a clear width not less than 560 mm (22 in.), a tread depth not less than 255 mm (10 in.), a riser height not exceeding 230 mm

(9 in.), a headroom not less than 2030 mm (80 in.), and a height between landings not exceeding 3660 mm (144 in.).

Exception No. 2: In assembly occupancies, the limitation on height between landings in Table 5.2.2.2.1 shall not apply to aisle stairs.

5.2.2.2.2 Curved Stairs. Curved stairs shall be permitted as a component in a means of egress where the minimum depth of tread is 280 mm (11 in.) at a point 305 mm (12 in.) from the narrower end of the tread, and the smallest radius is at least twice the stair width.

5.2.2.2.3 Spiral Stairs. (See 7.2.9 for exemptions to these requirements.)

5.2.2.2.3.1 In the occupancies shown in Table 5.2.2.3.1, spiral stairs shall be permitted as a component in a means of egress in accordance with 5.2.2.2.3.2 and 5.2.2.2.3.3.

Table 5.2.2.3.1 Occupancies Permitting Spiral Stairs

Occupancy	Condition
Assembly	From lighting and access catwalks, galleries, and gridirons
Detention and correctional	For access to and between staff locations
Apartment buildings	Within a single dwelling unit
Dwellings	Within a single dwelling unit
Mercantile	—
Business	—
Industrial	—
Storage	—

5.2.2.2.3.2 Spiral stairs shall be permitted, provided the following criteria are met:

- (1) Riser heights shall not exceed 180 mm (7 in.).
- (2) The stairway shall have a tread depth of not less than 280 mm (11 in.) for a portion of the stairway width sufficient to provide egress capacity for the occupant load served in accordance with 5.3.3.1.
- (3) At the outer side of the stairway, an additional 265 mm (10½ in.) of width shall be provided clear to the other handrail, and this width shall not be included as part of the required egress capacity.
- (4) Handrails complying with 5.2.2.4 shall be provided on both sides of the spiral stairway.
- (5) The inner handrail shall be located within 610 mm (24 in.), measured horizontally, of the point where a tread depth not less than 280 mm (11 in.) is provided.
- (6) The turn of the stairway shall be such that descending users have the outer handrail at their right side.

5.2.2.2.3.3 Where the occupant load served does not exceed three, spiral stairs shall be permitted, provided that the following criteria are met:

- (1) The clear width of the stairs shall be not less than 66 cm (26 in.).
- (2) The height of risers shall not exceed 240 mm (9½ in.).
- (3) The headroom shall be not less than 1980 mm (78 in.).
- (4) Treads shall have a depth not less than 190 mm (7½ in.) at a point 305 mm (12 in.) from the narrower edge.
- (5) All treads shall be identical.
- (6) Handrails shall be provided on both sides of the stairway.

5.2.2.2.4* Winders. In the occupancies shown in Table 5.2.2.2.4, winders shall be permitted in stairs. Winders shall have a tread depth not less than 150 mm (6 in.) and a depth of tread not less than 280 mm (11 in.) at a point 305 mm (12 in.) from the narrowest edge.

Table 5.2.2.2.4 Occupancies Permitting Winders

Occupancy	Condition
Apartment buildings	Within a single dwelling unit
Lodging or rooming houses	—
Dwellings	Within a single dwelling unit
Residential board and care, small	—

5.2.2.3 Stair Details.

5.2.2.3.1 Construction. All stairs serving as required means of egress shall be of permanent, fixed construction.

Exception: In assembly occupancies, stairs that serve seating that is designed to be repositioned.

5.2.2.3.2 Landings. Stairs shall have landings at door openings. Every landing shall have a dimension measured in the direction of travel that is at least equal to the width of the stair. (See 5.2.1.3.) Stairs and intermediate landings shall continue with no decrease in width along the direction of egress travel.

Exception No. 1: Landings shall be permitted to be not more than 1220 mm (48 in.) in the direction of travel, provided the stair has a straight run.

Exception No. 2: In one- and two-family dwellings, a door at the top of a stair shall be permitted to open directly at a stair, provided the door does not swing over the stair and the door serves an area with an occupant load of fewer than 50 persons.

5.2.2.3.3* Tread and Landing Surfaces. Stair treads and landings shall be solid, without perforations, and free of projections or lips that could trip stair users. If not vertical, risers shall be permitted to slope under the tread at an angle of not more than 30 degrees from vertical; however, the permitted projection of the nosing shall not exceed 38 mm (1½ in.).

Exception: Grated stair treads and landing floors shall be permitted in the following:

- (1) Detentional and correctional occupancies
- (2) Industrial occupancies
- (3) Assembly occupancies in means of egress from lighting and access catwalks, galleries, and gridirons

5.2.2.3.4* Tread Slope. Tread slope shall not exceed a slope of 1 in 48.

5.2.2.3.5* Riser Height and Tread Depth. Riser height shall be measured as the vertical distance between tread nosings. Tread depth shall be measured horizontally between the vertical planes of the foremost projection of adjacent treads and at a right angle to the tread's leading edge, but tread depth shall not include beveled or rounded tread surfaces that slope more than 20 degrees (a slope of 1 in 2.75). At tread nosings, such beveling or rounding shall not exceed 13 mm (½ in.) in horizontal dimension.

5.2.2.3.6 Dimensional Uniformity. There shall be no variation exceeding 4.8 mm ($\frac{3}{16}$ in.) in the depth of adjacent treads or in the height of adjacent risers, and the tolerance between the largest and smallest riser or between the largest and smallest tread shall not exceed 9.5 mm ($\frac{3}{8}$ in.) in any flight.

Exception: Where the bottom riser adjoins a sloping public way, walk, or driveway having an established grade and serving as a landing, a variation in height of the bottom riser not exceeding 75 mm (3 in.) in every 915 mm (36 in.) of stairway width shall be permitted.

5.2.2.4 Guards and Handrails.

5.2.2.4.1* Guards. Means of egress that are more than 760 mm (30 in.) above the floor or grade below shall be provided with guards to prevent falls over the open side. (See also 5.2.2.4.6.)

5.2.2.4.2* Handrails. Stairs and ramps shall have handrails on both sides. In addition, handrails shall be provided within 760 mm (30 in.) of all portions of the required egress width of stairs. The required egress width shall be along the natural path of travel. (See also 5.2.2.4.5.) (See 7.2.10 for exemption to this requirement.)

Exception No. 1: If part of a curb separates a sidewalk from a vehicular way, a single step or a ramp shall not be required to have a handrail.

Exception No. 2: Stairs within dwelling units and guest rooms, and ramps within dwelling units and guest rooms, shall have a handrail on at least one side.

5.2.2.4.3 Continuity. Required guards and handrails shall continue for the full length of each flight of stairs. At turns of stairs, inside handrails shall be continuous between flights at landings. (See 7.2.11 for exemption to this requirement.)

5.2.2.4.4 Projections. The design of guards and handrails and the hardware for attaching handrails to guards, balusters, or walls shall be such that there are no projections that might engage loose clothing. Openings in guards shall be designed to prevent loose clothing from becoming wedged in such openings.

5.2.2.4.5* Handrail Details.

5.2.2.4.5.1* Handrails on stairs or ramps shall have a consistent height of at least 865 mm (34 in.) and not more than 965 mm (38 in.) above the surface of the stair tread or ramp walking surface, measured vertically to the top of the rail from the leading edge of the tread or the ramp walking surface. (See 7.2.11.1 for exemption to this requirement.)

Exception No. 1: The height of required handrails that form part of a guard shall be permitted to be not more than 1065 mm (42 in.), measured vertically to the top of the rail from the leading edge of the tread.

Exception No. 2: Additional handrails that are lower or higher than the main handrail shall be permitted.

5.2.2.4.5.2* Handrails shall provide a clearance of not less than 38 mm ($\frac{1}{2}$ in.) between the handrail and the wall to which it is fastened. (See 7.2.11.2 for exemption to this requirement.)

5.2.2.4.5.3* Handrails shall have a circular cross section with an outside diameter of not less than 32 mm ($\frac{1}{4}$ in.) and not more than 51 mm (2 in.). (See 7.2.11.3 for exemption to this requirement.)

Exception: Any other shape with a perimeter dimension of not less than 100 mm (4 in.), but not more than 160 mm ($\frac{6}{4}$ in.), and with the largest cross-sectional dimension not more than 57 mm ($\frac{2}{4}$ in.) shall be permitted, provided that edges are rounded so as to provide a minimum radius of 3.2 mm ($\frac{1}{8}$ in.).

5.2.2.4.5.4 Handrails shall be continuously graspable along the entire length.

Exception: Handrail brackets or balusters attached to the bottom surface of the handrail shall not be considered to be obstructions to graspability, provided the following criteria are met:

- (1) They do not project horizontally beyond the sides of the handrail within 38 mm ($\frac{1}{2}$ in.) of the bottom of the handrail and provided that, for each 13 mm ($\frac{1}{2}$ in.) of additional handrail perimeter dimension above 100 mm (4 in.), the vertical clearance dimension of 38 mm ($\frac{1}{2}$ in.) can be reduced by 3 mm ($\frac{1}{8}$ in.).
- (2) They have edges with a radius of not less than 0.25 mm (0.01 in.).
- (3) They obstruct not in excess of 20 percent of the handrail length if the graspable perimeter dimension is less than 140 mm ($\frac{5}{2}$ in.).

5.2.2.4.5.5 Handrail ends shall be returned to the wall or floor or shall terminate at newel posts. (See 7.2.11.4 for exemption to this requirement.)

5.2.2.4.5.6 Handrails that are not continuous between flights shall extend horizontally, at the required height, not less than 305 mm (12 in.) beyond the top riser and continue to slope for a depth of one tread beyond the bottom riser. (See 7.2.11.5 for exemption to this requirement.)

Exception: Within dwelling units, the handrail shall be permitted to extend, at the required height, to points directly above the top and bottom risers.

5.2.2.4.6 Guard Details.

5.2.2.4.6.1 The height of guards required in 5.2.2.4.1 shall be measured vertically to the top of the guard from the surface adjacent thereto.

5.2.2.4.6.2 Guards shall be not less than 1065 mm (42 in.) high. (See 7.2.11.6 for exemption to this requirement.)

Exception: As specified in the assembly seating provisions of Section 5.15.

5.2.2.4.6.3* Open guards shall have intermediate rails or an ornamental pattern such that a sphere 100 mm (4 in.) in diameter shall not pass through any opening up to a height of 865 mm (34 in.). (See 7.2.11.7 for exemption to this requirement.)

Exception No. 1: The triangular openings formed by the riser, tread, and bottom element of a guardrail at the open side of a stair shall be of such size that a sphere 150 mm (6 in.) in diameter shall not pass through the triangular opening.

Exception No. 2: In detention and correctional occupancies, in industrial occupancies, and in storage occupancies, the clear distance between intermediate rails measured at right angles to the rails shall not exceed 535 mm (21 in.).

5.2.2.5 Enclosure and Protection of Stairs.

5.2.2.5.1 Enclosures. All inside stairs serving as an exit or exit component shall be enclosed in accordance with 5.1.1.2.

5.2.2.5.2* Exposures. Where nonrated walls or unprotected openings enclose the exterior of a stairway and the walls or openings are exposed by other parts of the building at an angle of not more than 180 degrees, the building enclosure

walls within 3050 mm (120 in.) horizontally of the nonrated wall or unprotected opening shall be constructed as required for stairway enclosures, including opening protectives. Construction shall extend vertically from the ground to a point 3050 mm (120 in.) above the topmost landing of the stairs or to the roofline, whichever is lower. (See 7.2.12 for exemption to these requirements.)

Exception: The fire resistance rating of the separation extending 3050 mm (120 in.) from the stairs shall not be required to be more than 1 hour with openings having a ¾-hour fire resistance rating.

5.2.2.5.3* Usable Space. There shall be no enclosed, usable space within an exit enclosure, including under stairs, nor shall any open space within the enclosure be used for any purpose that has the potential to interfere with egress.

Exception: Enclosed usable space shall be permitted under stairs if the space is separated from the stair enclosure by the same fire resistance as the exit enclosure. Entrance to such enclosed usable space shall not be from within the stair enclosure. (See also 5.1.1.2.3.)

5.2.2.5.4* Stair Identification Signs. Stairs serving five or more stories shall be provided with signage within the enclosure at each floor landing. The signage shall indicate the story, the terminus of the top and bottom of the stair enclosure, and the identification of the stair. The signage also shall state the story of, and the direction to, exit discharge. The signage shall be inside the enclosure and shall be located approximately 1525 mm (60 in.) above the floor landing in a position that is readily visible when the door is in the open or closed position.

5.2.2.5.5 Egress Direction Signs. Where an enclosed stair requires travel in an upward direction to reach the level of exit discharge, signs with directional indicators that indicate the direction to the level of exit discharge shall be provided at each floor level landing from which upward direction of travel is required. Such signage shall be readily visible when the door is in the open or closed position.

Exception No. 1: Where signs required by 5.2.2.5.4 are provided.

Exception No. 2: Stairs that extend not more than one story below the level of exit discharge where the exit discharge is clearly obvious.

5.2.2.6 Special Provisions for Outside Stairs.

5.2.2.6.1 Access. If approved by the authority having jurisdiction, outside stairs shall be permitted where leading to roofs of other sections of the building or an adjoining building, where the construction is fire resistive and where there is a continuous means of egress from the roof. (See also 5.7.6.)

5.2.2.6.2 Visual Protection. Outside stairs shall be arranged to avoid any impediments to the use of the stairs by persons having a fear of high places. For stairs more than three stories in height, any arrangement intended to meet this requirement shall be no less than 1220 mm (48 in.) in height.

5.2.2.6.3 Separation and Protection of Outside Stairs. Outside stairs shall be separated from the interior of the building by walls with the fire resistance rating required for enclosed stairs with fixed or self-closing opening protectives. This construction shall extend vertically from the ground to a point 3050 mm (120 in.) above the topmost landing of the stairs or to the roofline, whichever is lower, and no less than 3050 mm (120 in.) horizontally.

Exception No. 1: Outside stairs serving an exterior exit access balcony that has two remote outside stairways or ramps shall be permitted to be unprotected.

Exception No. 2: Outside stairs serving not more than two adjacent stories, including the story of exit discharge, shall be permitted to be unprotected where there is a remotely located second exit.

Exception No. 3: The fire resistance rating of the separation extending 3050 mm (120 in.) from the stairs shall not be required to be more than 1 hour with openings having a ¾-hour fire protection rating.

5.2.2.6.4 Protection of Openings. All openings below an outside stair shall be protected with an assembly having a ¾-hour fire protection rating under one of the following conditions:

- (1) Where located in a court, the smallest dimension of which is not more than one-third its height
- (2) Where located in an alcove having a width not exceeding one-third its height and a depth exceeding one-fourth its height

5.2.2.6.5* Water Accumulation. Outside stairs and landings shall be designed to minimize water accumulation on their surfaces.

5.2.2.6.6 Openness. Outside stairs shall be at least 50 percent open on one side and shall be arranged to restrict the accumulation of smoke.

5.2.3 Smokeproof Enclosures.

5.2.3.1 General. Smokeproof enclosures shall be permitted to be used in the means of egress. Where smokeproof enclosures are used in the means of egress, they shall conform to the general requirements of Section 5.1, the special requirements of 5.2.3, and the building code. (See 7.2.13 for exemption to this requirement.)

5.2.3.2 Enclosure. A smokeproof enclosure shall be enclosed from the highest point to the lowest point by barriers that have 2-hour fire resistance ratings. Where a vestibule is used, it shall be within the 2-hour rated enclosure and shall be considered part of the smokeproof enclosure.

5.2.3.3 Vestibule. Where a vestibule is provided, the doorway into the vestibule shall be protected with an approved fire door assembly that has a 1½-hour fire protection rating, and the fire door assembly from the vestibule to the smokeproof enclosure shall have at least a 20-minute fire protection rating. Doors shall be designed to minimize air leakage and shall be self-closing or shall be automatic-closing by actuation of a smoke detector within 3050 mm (120 in.) of the vestibule door.

5.2.3.4 Discharge. Every smokeproof enclosure shall discharge into a public way, into a yard or court having direct access to a public way, or into an exit passageway. Such exit passageways shall be without openings other than the entrance from the smokeproof enclosure and the door to the outside yard, court, or public way. The exit passageway shall be separated from the remainder of the building by a 2-hour fire resistance rating.

5.2.4 Horizontal Exits.

5.2.4.1* General. Horizontal exits shall be permitted to be used in the means of egress. Where horizontal exits are used in the means of egress, they shall conform to the general requirements of Section 5.1 and the special requirements of 5.2.4. Horizontal exits shall be permitted to be substituted for other exits to the extent that the total egress capacity of the other exits (stairs, ramps, doors leading outside the building) shall be at least half that required for the entire area of the

building or connected buildings, provided no horizontal exits exist.

Exception No. 1: In health care occupancies, the total egress capacity of the other exits shall be permitted to be reduced to one-third that required for the entire area of the building.

Exception No. 2: In detention and correctional occupancies, horizontal exits shall be permitted to comprise 100 percent of the exits required, provided that an exit, other than a horizontal exit, is accessible in some other (not necessarily adjacent) fire compartment without requiring return through the compartment of fire origin.

5.2.4.2 Health Care Occupancy Horizontal Exits.

5.2.4.2.1 Health care occupancy horizontal exits shall comply with the requirements of 5.2.4.1 and 5.2.4.3 through 5.2.4.5 except as modified by 5.2.4.2.

5.2.4.2.2 A single door shall be permitted in a horizontal exit if the exit serves one direction only. Such door shall be a swinging door or a horizontal sliding door that complies with 5.2.1.14. The door shall be not less than 1055 mm (41.5 in.) in clear width.

5.2.4.2.3 A horizontal exit involving a corridor not less than 2440 mm (96 in.) in width that serves as a means of egress from both sides of the doorway shall have the opening protected by a pair of swinging doors arranged to swing in opposite directions from each other, with each door having a clear width not less than 1055 mm (41.5 in.), or by a horizontal sliding door that complies with 5.2.1.14 and provides a clear width not less than 2110 mm (83 in.).

5.2.4.2.4 A horizontal exit involving a corridor not less than 1830 mm (72 in.) in width that serves as a means of egress from both sides of the doorway shall have the opening protected by a pair of swinging doors arranged to swing in opposite directions from each other, with each door having a clear width not less than 810 mm (32 in.), or a horizontal sliding door that complies with 5.2.1.14 and provides a clear width not less than 1625 mm (64 in.).

5.2.4.2.5 An approved vision panel shall be required in each horizontal exit. Center mullions shall be prohibited.

5.2.4.3 Fire Compartments.

5.2.4.3.1 Every fire compartment for which credit is allowed in connection with a horizontal exit shall have, in addition to the horizontal exit or exits, at least one exit, but not less than 50 percent of the required number and capacity of exits, that is not a horizontal exit. Any fire compartment not having an exit leading outside shall be considered as part of an adjoining compartment with an exit leading to the outside.

Exception: As provided for health care occupancies and detention and correctional occupancies in Exception No. 1 and No. 2 to 5.2.4.1.

5.2.4.3.2 Every horizontal exit for which credit is given shall be arranged so that there are continuously available paths of travel leading from each side of the exit to stairways or other means of egress leading to outside the building.

5.2.4.3.3 Wherever either side of the horizontal exit is occupied, the doors used in connection with the horizontal exit shall be unlocked from the egress side.

Exception: As provided for health care occupancies and detention and correctional occupancies in 5.2.1.5.

5.2.4.3.4 The floor area on either side of a horizontal exit shall be sufficient to hold the occupants of both floor areas, providing a clear floor area per person not less than that shown in Table 5.2.4.3.4.

Table 5.2.4.3.4 Minimum Floor Area on Each Side of Horizontal Exit

Occupancy/Use	Clear Floor Area	
	net m ²	net ft ²
Health care — hospital, nursing home	2.8/patient	30/patient
Health care — limited care facility	1.4/patient	15/patient
Health care — stories not housing bed or litter patients	0.56/occupant	6/occupant
Detention and correctional	0.56/occupant	6/occupant
All others	0.28/occupant	3/occupant

5.2.4.4 Fire Barriers.

5.2.4.4.1 Fire barriers separating building areas between which there are horizontal exits shall have a 2-hour fire resistance rating with 1½-hour fire protection-rated opening protectives and shall provide a separation continuous to ground.

Exception: Where a fire barrier provides a horizontal exit in any story of a building, such fire barrier shall not be required on other stories under the following conditions:

- (1) The stories on which the fire barrier is omitted are separated from the story with the horizontal exit by construction having a fire resistance rating not less than that of the horizontal exit fire barrier.
- (2) Vertical openings between the story with the horizontal exit and the open fire area story are enclosed with construction having a fire resistance rating not less than that of the horizontal exit fire barrier.
- (3) All required exits, other than horizontal exits, discharge directly to the outside.

5.2.4.4.2 Where fire barriers that serve horizontal exits terminate at outside walls and the outside walls, for a distance of 3050 mm (120 in.) on each side of the horizontal exit, are at an angle of not more than 180 degrees, the outside walls shall have a 1-hour fire resistance rating with ¾-hour fire protection-rated opening protectives for a distance of 3050 mm (120 in.) on each side of the horizontal exit. (See 7.2.14 for exemption to this requirement.)

5.2.4.4.3 Fire barriers forming horizontal exits shall not be penetrated by ducts. (See 7.2.15 for exemption to this requirement.)

Exception No. 1: In buildings protected throughout by an approved, supervised automatic sprinkler system.

Exception No. 2: In detention and correctional occupancies, duct penetrations that are protected by combination fire dampers/smoke leakage-rated dampers.

5.2.4.4.4 Any opening in such fire barriers shall be protected.

5.2.4.4.5 Doors in horizontal exits shall comply with 5.2.1.4.

Exception: In horizontal exits in industrial and storage occupancies, where the doorway is protected by a fire door on each side of the wall in which it is located and one fire door is of the swinging type, the other door shall be permitted to be an automatic sliding fire door that shall be kept open whenever the building is occupied.

5.2.4.4.6 Swinging fire doors shall be permitted in horizontal exits, provided the following conditions are met (*See 7.2.16 for exemption to these requirements*):

- (1) The doors swing in the direction of egress travel.
- (2) Where a horizontal exit serves areas on both sides of a fire barrier, there are adjacent openings with swinging doors, opening in opposite directions, with signs on each side of the fire barrier indicating the door that swings with the travel from that side. Sleeping room areas in detention and correctional occupancies shall be exempt from the sign requirement.
- (3) The doors are of any other approved arrangement, provided that they always swing in the direction of any possible egress travel.

5.2.4.4.7* Doors in horizontal exits shall be designed and installed so as to minimize air leakage.

5.2.4.4.8* All fire doors in horizontal exits shall be self-closing or automatic-closing in accordance with 5.2.1.8. Horizontal exit doors located across a corridor shall be automatic-closing in accordance with 5.2.1.8. (*See 7.2.17 for exemption to this requirement.*)

5.2.4.5 Bridges and Balconies.

5.2.4.5.1 Each bridge or balcony utilized in conjunction with horizontal exits shall have guards and handrails that comply with the requirements of 5.2.2.4.

5.2.4.5.2 Every bridge or balcony shall be at least as wide as the door leading to it and at least 1120 mm (44 in.) wide. (*See 7.2.18 for exemption to this requirement.*)

5.2.4.5.3 Where a bridge or balcony serves as a horizontal exit in one direction, the door shall be required to swing only in the direction of egress travel.

5.2.4.5.4 Where a 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 in the direction of egress travel shall be counted in the determination of egress capacity. (*See 7.2.19 for exemption to these requirements.*)

5.2.4.5.5 In climates subject to the accumulation of snow and ice, the bridge or balcony shall be protected to prevent the accumulation of snow and ice on the floor.

5.2.4.5.6 All wall openings, in both of the connected buildings or fire areas, any part of which is within 3050 mm (120 in.) of any bridge or balcony as measured horizontally or from below, shall be protected with fire doors or fixed fire window assemblies that have a ¾-hour fire protection rating. (*See 7.2.20 for exemption to this requirement.*)

5.2.5 Ramps.

5.2.5.1 General. Ramps shall be permitted to be used in the means of egress. Where ramps are used in the means of egress, they shall conform to the general requirements of Section 5.1 and to the special requirements of 5.2.5.

5.2.5.2* Dimensional Criteria. Ramps shall be in accordance with Table 5.2.5.2. (*See 7.2.21 for exemption to this requirement.*)

Table 5.2.5.2 Ramps

Element	Dimension
Minimum width clear of all obstructions, except projections not more than 90 mm (3½ in.) at or below handrail height on each side	1120 mm (44 in.)
Maximum slope	1 in 12
Maximum cross slope	1 in 48
Maximum rise for a single ramp run	760 mm (30 in.)

Exception No. 1: Where not part of an accessible means of egress, ramps shall be permitted to have a slope not steeper than 1 in 8.

Exception No. 2: Industrial equipment access ramps and landings that serve as a component of the means of egress from the involved equipment and do not serve more than 20 people shall be permitted to have a minimum clear width of 560 mm (22 in.) and a maximum height between landings of 3660 mm (144 in.).

Exception No. 3: Ramps that provide access to vehicles, vessels, mobile structures, and aircraft shall not be required to comply with the maximum slope or maximum rise for a single ramp run.

5.2.5.3 Ramp Details.

5.2.5.3.1 Construction.

5.2.5.3.1.1 All ramps that serve as required means of egress shall be of permanent fixed construction.

5.2.5.3.1.2 The ramp floor and landings shall be solid and without perforations.

5.2.5.3.2 Landings. (*See 7.2.22 for exemption to these requirements.*)

5.2.5.3.2.1 Ramps shall have landings at the top, at the bottom, and at doors opening onto the ramp. The slope of the landing shall not be steeper than 1 in 48. Every landing shall have a width at least the width of the ramp. Every landing shall be not less than 1525 mm (60 in.) long in the direction of travel.

5.2.5.3.2.2 Any changes in travel direction shall be made only at landings. Such landings shall have minimum dimensions of 1525 mm × 1525 mm (60 in. × 60 in.).

5.2.5.3.3 Drop-Offs. Ramps and landings with drop-offs shall have curbs, walls, railings, or projecting surfaces that prevent people from traveling off the edge of the ramp. Curbs or barriers shall be no less than 100 mm (4 in.) in height.

5.2.5.4 Guards and Handrails. Guards that comply with 5.2.2.4 shall be provided for ramps. Handrails that comply with 5.2.2.4 shall be provided along both sides of a ramp run with a rise greater than 150 mm (6 in.). The height of handrails and guards shall be measured vertically to the top of the guard or rail from the walking surface adjacent thereto.

Exception: Guards and handrails provided for ramped aisles in assembly occupancies in accordance with the provisions of Section 5.15.

5.2.5.5 Enclosure and Protection of Ramps. Ramps in a required means of egress shall be enclosed or protected as a stair in accordance with 5.2.2.5 and 5.2.2.6. The use of Exception No. 2 to 5.2.2.6.3 shall be prohibited.

5.2.5.6 Special Provisions for Outside Ramps.

5.2.5.6.1* Visual Protection. Outside ramps shall be arranged to avoid any impediments to their use by persons having a fear of high places. For ramps more than three stories in height, any arrangement intended to meet this requirement shall be no less than 1220 mm (48 in.) in height.

5.2.5.6.2 Water Accumulation. Outside ramps and landings shall be designed to minimize water accumulation on their surfaces.

5.2.6* Exit Passageways.

5.2.6.1* General. Exit passageways shall be permitted to be used in the means of egress. Where exit passageways are used in the means of egress, they shall conform to the general requirements of Section 5.1 and to the special requirements of 5.2.6.

5.2.6.2 Enclosure. An exit passageway shall be separated from other parts of the building as specified in 5.1.1.2.

Exception: Fire windows shall be permitted to be installed in such a separation in a building protected throughout by an approved, supervised automatic sprinkler system.

5.2.6.3 Stair Discharge. An exit passageway that serves as a discharge from a stair enclosure shall have not less than the same fire resistance rating and opening protective fire protection rating as those required for the stair enclosure. (See 7.2.23 for an exemption to this requirement.)

5.2.6.4* Width. The width of an exit passageway shall be adequate to accommodate the aggregate required capacity of all exits discharging through it.

Exception No. 1: Where an exit passageway serves occupants of the level of exit discharge as well as other stories, capacity shall not be required to be aggregated.

Exception No. 2: An exit passageway in a covered mall building shall be permitted to accommodate the following independently:

- (1) Its assigned occupant load from only the covered mall/pedestrian way
- (2) The largest occupant load assigned to it from a single tenant space/store

5.2.6.5 Floor. The floor shall be solid and without perforations.

5.2.7 Escalators and Moving Walks. Escalators and moving walks shall not constitute a part of the required means of egress.

5.2.8 Fire Escape Stairs. Fire escape stairs shall not constitute any of the required means of egress. (See 7.2.24 for exemption to this requirement.)

5.2.9 Fire Escape Ladders.

5.2.9.1 General. Fire escape ladders shall be permitted in the means of egress to provide any of the following:

- (1) Access to unoccupied roof spaces
- (2) A second means of egress from storage elevators
- (3) A means of egress from towers and elevated platforms around machinery or similar spaces subject to occupancy by no more than three persons

- (4) A secondary means of egress from boiler rooms or similar spaces subject to occupancy by no more than three persons

5.2.9.2 Construction and Installation.

5.2.9.2.1 Fire escape ladders shall comply with ANSI A14.3, *Safety Requirements for Fixed Ladders*. (See 7.2.25 for exemption to this requirement.)

Exception: In industrial occupancies, industrial stairs that comply with the minimum requirements for fixed stairs of ANSI A1264.1, Safety Requirements for Workplace Floor and Wall Openings, Stairs and Railing Systems, shall be permitted where fire escape ladders are permitted.

5.2.9.2.2 Ladders shall be installed with a pitch of not less than 75 degrees.

5.2.9.3 Access. The lowest rung of any ladder shall not be more than 305 mm (12 in.) above the level of the surface beneath it.

5.2.10 Slide Escapes.

5.2.10.1 General.

5.2.10.1.1 Slide escapes that comply with the general requirements of Section 5.1 and the special requirements of 5.2.10 shall be permitted in the means of egress in the following occupancies:

- (1) High-hazard industrial occupancies, provided the slide escapes are used in drills to familiarize occupants with their use through practice
- (2) Storage occupancies

5.2.10.1.2 Each slide escape shall be of an approved type.

5.2.10.2 Capacity.

5.2.10.2.1 Slide escapes, where permitted as required means of egress, shall be rated at a capacity of 60 persons.

5.2.10.2.2 Slide escapes shall not constitute more than 25 percent of the egress capacity from any building or structure or any individual story thereof.

Exception: Slide escapes shall be permitted to constitute 100 percent of the egress capacity in high-hazard industrial occupancies.

5.2.11* Alternating Tread Devices.

5.2.11.1 Alternating tread devices shall be permitted in the means of egress to provide any of the following:

- (1) Access to unoccupied roof spaces
- (2) A second means of egress from storage elevators
- (3) A means of egress from towers and elevated platforms around machinery or similar spaces subject to occupancy by no more than three persons
- (4) A secondary means of egress from boiler rooms or similar spaces subject to occupancy by no more than three persons

5.2.11.2 Alternating tread devices shall comply with the following:

- (1) Handrails are provided on both sides of alternating tread devices in accordance with 5.2.2.4.5.
- (2) The clear width between handrails is not less than 430 mm (17 in.) and not more than 610 mm (24 in.).
- (3) Headroom is not less than 2030 mm (80 in.).
- (4) The angle of the device is between 50 and 68 degrees to horizontal.
- (5) The height of the riser does not exceed 240 mm (9.5 in.).

- (6) Treads have a projected tread depth not less than 145 mm (5.8 in.), measured in accordance with 5.2.2.3.5, with each tread providing a depth not less than 240 mm (9.5 in.) including tread overlap.
- (7) A distance not less than 150 mm (6 in.) is provided between the stair handrail and any other object.
- (8) The initial tread of the stair begins at the same elevation as the platform, landing, or floor surface.
- (9) The alternating treads are not laterally separated by more than 51 mm (2 in.).
- (10) The occupant load served is not more than three persons.

5.2.12 Areas of Refuge.

5.2.12.1 General. An area of refuge used as part of a required accessible means of egress in accordance with 5.5.4, or used as a part of any required means of egress, shall conform to the general requirements of Section 5.1 and the special requirements of 5.2.12.2 and 5.2.12.3.

Exception No. 1: Areas of refuge consisting of stories of buildings that are protected throughout by an approved, supervised automatic sprinkler system.

Exception No. 2: In buildings protected throughout by an approved, supervised automatic sprinkler system, two rooms or spaces separated from each other by smoke-resistant partitions in accordance with 3.3.6, Area of Refuge, shall not be required in hotels and dormitories, apartment buildings, mercantile occupancies, and business occupancies.

5.2.12.2 Accessibility.

5.2.12.2.1 Required portions of an area of refuge shall be accessible from the space they serve by an accessible means of egress.

5.2.12.2.2 Required portions of an area of refuge shall have access to a public way, without requiring return to the building spaces through which travel to the area of refuge occurred, via an exit or an elevator.

5.2.12.2.3* Where the exit providing egress from an area of refuge to a public way, in accordance with 5.2.12.2.2, includes stairs, the minimum clear width of landings and stair flights, measured between handrails and at all points below handrail height, shall be 1220 mm (48 in.). (See 7.2.26 for exemption to this requirement.)

Exception No. 1: The minimum 1220 mm (48 in.) clear width shall not be required if the area of refuge is separated from the remainder of the story by a horizontal exit that meets the requirements of 5.2.4. (See also 5.2.12.3.4.)

Exception No. 2: For stairs where egress is in the descending direction, a minimum 940 mm (37 in.) clear width, measured at and below handrail height, shall be permitted if approved alternative measures are provided that do not require carrying occupied wheelchairs on the stairs.

5.2.12.2.4* If an elevator provides access from an area of refuge to a public way, in accordance with 5.2.12.2.2, the elevator shall be approved for fire fighter service as specified in Section 211 of ASME/ANSI A17.1, *Safety Code for Elevators and Escalators*. The power supply shall be protected against interruption from fire that occurs within the building but outside the area of refuge. The elevator shall be located in a shaft system that meets the requirements of 5.2.3 for smokeproof enclosures.

Exception No. 1: The smokeproof enclosure shall not be required for areas of refuge that exceed 93 m² (1000 ft²) in size and are created by a horizontal exit that meets the requirements of 5.2.4.

Exception No. 2: Elevators that comply with 5.2.13.

5.2.12.2.5 The area of refuge shall be provided with a two-way communication system for communication between the area of refuge and a central control point. The door to the stair enclosure or the elevator door and the associated portion of the area of refuge that the stair enclosure door or elevator door serves shall be identified by signage. (See 5.2.12.3.5.)

5.2.12.2.6* Instructions for summoning assistance, via the two-way communication system, and written identification of the area of refuge location shall be posted adjacent to the two-way communication system.

5.2.12.3 Details.

5.2.12.3.1* Each area of refuge shall be sized to accommodate one wheelchair space of 760 mm × 1220 mm (30 in. × 48 in.) for each 200 occupants, or portion thereof, based on the occupant load served by the area of refuge. Such wheelchair spaces shall maintain the width of a means of egress to no less than that required for the occupant load served and no less than 915 mm (36 in.).

5.2.12.3.2* For any area of refuge not exceeding 93 m² (1000 ft²) in size, it shall be demonstrated by calculation or test that tenable conditions are maintained within the area of refuge for a period of 15 minutes when the exposing space on the other side of the separation creating the area of refuge is subjected to the maximum expected fire conditions.

5.2.12.3.3 Access to any designated wheelchair space in an area of refuge shall not be through more than one adjoining wheelchair space.

5.2.12.3.4* Each area of refuge shall be separated from the remainder of the story by a barrier with a fire resistance rating not less than 1 hour, unless a greater rating is required in other provisions of this Code. Such barriers, and any openings in them, shall minimize air leakage and retard the passage of smoke. Doors in such barriers shall have not less than a 20-minute fire protection rating, unless a greater rating is required in other provisions of this Code, and shall be either self-closing or automatic-closing in accordance with 5.2.1.8.2. Ducts shall be permitted to penetrate such barriers, unless prohibited in other provisions of this Code, and shall be provided with smoke-actuated dampers or other approved means to resist the transfer of smoke into the area of refuge. (See 7.2.27 for exemption to this requirement.)

5.2.12.3.5 Each area of refuge shall be identified by tactile and visual signs stating the following: AREA OF REFUGE. The signs shall conform to the requirements of ICC/ANSI A117.1, *American National Standard for Accessible and Usable Buildings and Facilities*, for such signage and shall display the international symbol of accessibility. Such signs shall be located at each door that provides access to the area of refuge.

5.2.12.3.6 Visual signs shall be installed at all exits not providing an accessible means of egress, as defined in 3.3.69.1, and where necessary to indicate clearly the direction to an area of refuge.

5.2.12.3.7 Signs required by 5.2.12.3.5 and 5.2.12.3.6 shall be illuminated as required for exit signs where exit sign illumination is required.

5.2.13 Elevators.

5.2.13.1* General. An elevator that complies with the requirements of 5.2.13 shall be permitted to be used as a second

means of egress from towers as defined in 3.3.105 under the following conditions:

- (1) The tower and any attached structure is protected throughout by an approved, supervised automatic sprinkler system.
- (2) The tower is subject to occupancy by not more than 90 persons.
- (3) Primary egress discharges directly to the outside.
- (4) There are no high-hazard content areas in the tower or attached structure.
- (5) 100 percent of the egress capacity is provided independent of the elevators.
- (6) An evacuation plan is implemented specifically including the elevator. As a part of that plan, staff personnel shall be trained in operation and procedures for elevator emergency use in normal operating mode prior to fire fighter recall.
- (7) The tower is not used by the general public.

5.2.13.2 Elevator Evacuation System Capacity.

5.2.13.2.1 The elevator car shall have a capacity of not less than eight persons.

5.2.13.2.2 The elevator lobby shall have a capacity of not less than 50 percent of the occupant load of the area served by the lobby. The capacity shall be calculated by using 0.28 m^2 (3 ft^2) per person and shall also include one wheelchair space of $760 \text{ mm} \times 1220 \text{ mm}$ ($30 \text{ in.} \times 48 \text{ in.}$) for each 50 persons, or fraction thereof, of the total occupant load served by that lobby.

5.2.13.3 Elevator Lobby. On every floor served by the elevator, there shall be an elevator lobby. Barriers forming the elevator lobby shall have a fire resistance rating of not less than 1 hour and shall be arranged as a smoke barrier.

5.2.13.4 Elevator Lobby Doors. Elevator lobby doors shall have a fire protection rating of not less than 1 hour and shall be self-closing doors or automatic-closing doors in accordance with 5.2.1.8.

5.2.13.5 Door Activation. The elevator lobby doors shall close in response to a signal from a smoke detector located directly outside the elevator lobby and adjacent to or on each door opening. The closing of lobby doors in response to a signal from the building fire alarm system shall be permitted. The closing of one elevator lobby door by means of a smoke detector or a signal from the building fire alarm system shall result in the closing of all elevator lobby doors that serve that elevator evacuation system.

5.2.13.6* Water Protection. Building elements shall be used to restrict water exposure of elevator equipment.

5.2.13.7* Power and Control Wiring. Elevator equipment, elevator communications, elevator machine room cooling, and elevator controller cooling shall be supplied by both normal and standby power. Wiring for power and control shall be located and properly protected to ensure not less than 1 hour of operation in the event of a fire.

5.2.13.8* Communications. Two-way communication systems shall be provided between elevator lobbies and a central control point and between elevator cars and a central control point. Communications wiring shall be protected to ensure not less than 1 hour of operation in the event of a fire.

5.2.13.9* Elevator Operation. Elevators shall be provided with fire fighter service in accordance with ASME/ANSI A17.1, *Safety Code for Elevators and Escalators*.

5.2.13.10 Maintenance. Where an elevator lobby is served by only one elevator car, the elevator evacuation system shall have a program of scheduled maintenance during times of building shutdown or low building activity. Repairs shall be performed within 24 hours of a breakdown.

5.2.13.11 Earthquake Protection. Elevators shall be capable of orderly shutdowns during earthquakes at locations where such a shutdown is an option of ASME/ANSI A17.1, *Safety Code for Elevators and Escalators*.

5.2.13.12 Signage. See 5.10.8.2.

5.3 Capacity of Means of Egress.

5.3.1 Occupant Load.

5.3.1.1 The total capacity of the means of egress for any story, balcony, tier, or other occupied space shall be sufficient for the occupant load thereof.

Exception No. 1: In mixed educational and assembly occupancies, where the assembly occupancy is of a type suitable for use only by the school occupant load (and therefore not subject to simultaneous occupancy), the same egress capacity shall be permitted to serve both sections.

Exception No. 2: In mixed educational and dormitory occupancies, where the classroom and dormitory sections are not subject to simultaneous occupancy, the same egress capacity shall be permitted to serve both sections.

5.3.1.2* The occupant load in any building or portion thereof shall be at least the number determined by dividing the floor area assigned to that use by the occupant load factor for that use as specified in Table 5.3.1.2 and Figure 5.3.1.2. If both gross and net area figures are given for the same occupancy, the following calculations shall be made:

- (1) Applying the gross area figure to the gross area of the portion of the building devoted to the use for which the gross area figure is specified
- (2) Applying the net area figure to the net area of the specific use for which the net area figure is specified

Exception No. 1: In a special-purpose industrial occupancy, the occupant load shall be the maximum number of persons to occupy the area under any probable conditions.

Exception No. 2: The occupant load for towers shall be the number of persons expected to occupy the space, with spaces not subject to human occupancy because of machinery or equipment excluded from consideration.

5.3.1.3 Occupant Load Increases.

5.3.1.3.1 The occupant load permitted in any building or portion thereof shall be permitted to be increased from that number established for the given use in accordance with 5.3.1.2, where all other requirements of this Code are also met, based on such increased number.

5.3.1.3.2 The authority having jurisdiction shall be permitted to require an approved aisle, seating, or fixed equipment diagram to substantiate any increase in occupant load and shall be permitted to require that such diagram be posted in an approved location.