NFPA 101B
Code for Means of Egress for Buildings and Structures

1999 Edition

National Fire Protection Association, 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

1999 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 the National Fire Protection Association, Inc., at its Fall Meeting held November 16–18, 1998, in Atlanta, GA. It was issued by the Standards Council on January 15, 1999, with an effective date of February 4, 1999.

This edition of NFPA 101B was approved as an American National Standard on February 4, 1999.

Origin and Development of NFPA 101B

This 1999 edition of NFPA 101B, *Means of Egress Code,* is the first edition. The *Code* 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 the Foreword, which precedes Chapter 1.

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Contents

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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 Appendix A.

Information on referenced publications can be found in Chapter 6 and Appendix B.

FOREWORD

This document is intended to be used as part of a building code and not as a stand-alone document. This document was developed with the understanding that the building code with which it is used addresses fire protection and life safety features essential to safe egress. These features include: classification and separation of occupancies, protection of vertical openings, requirements for fire protection systems and equipment (fire alarms, extinguishers, automatic extinguishing systems, standpipes, and smoke control), interior finish, building construction and compartmentation, building service equipment, special hazard protection, and so on.

Examples of how the occupancy classes addressed by this document might compare with the occupancy classes used in the International Building Code (IBC) are illustrated in Table 1.

This document also recognizes that the building code will scope the application of this document as it relates to new construction, additions, alterations, renovations, and change of use.

Table 1 Occupancy Classification Comparison

General	IBC	NFPA 101B
Assembly	A1, A2, A3, A4, A5	Assembly
Business	B	Business
Educational	E	Educational
Factory	F1, F2	General and special purpose industrial
Industrial Hazardous	H1, H2, H3	High-hazard industrial, other occupancies with high-hazard contents
	H4	Business, general industrial, storage
	H5	General or high-hazard industrial
Institutional	I1	Large residential board and care
	I2	Health care (hospital, nursing home, limited care)
	I3 (Condition 1-5)	Detention and correctional
	I4 (Adult Care, Child Care, Child Day Care, Child Day-Care Home)	Day care (day-care occupancy, group day-care home, family day-care home)
Mercantile	M	Mercantile (Class A, B, C)
Residential	R1	Hotels
	R2	Apartments, dormitories, lodging and rooming houses
	R3	One- and two-family dwellings
	R4	Small residential board and care
Storage	S1, S2	Storage
Utility/Misc.	U	(not applicable)

Chapter 1 General

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*."

1-2* Scope.

1-2.1* This *Code* addresses those egress features necessary to minimize danger to life from fire, including smoke or panic.

1-2.2 This *Code* identifies the minimum criteria for the design of egress facilities so as to permit prompt escape of occupants from buildings or relocation into safe areas within buildings.

1-2.3 This *Code* does not attempt to address all those general fire prevention or building construction features that are normally a function of fire prevention and building codes.

1-2.4 The prevention of personal injuries incurred by an individual's own negligence, and the preservation of property from loss by fire have not been considered as the basis for any of the provisions of this *Code*.

1-3 Application.

1-3.1 New Construction.

1-3.1.1 Means of egress for new construction shall comply with Chapter 3 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 3 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 3 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 3 and those requirements specifically applicable to business occupancies and ambulatory health care facilities.

1-3.2 Means of Escape. The means of escape provisions of Chapter 4 shall apply to the following:

(a) One- and two-family dwellings

(b) Dwelling units of apartment buildings

(c) Guest rooms or guest suites of hotels and dormitories

(d) Lodging and rooming houses

(e) Small residential board and care occupancies

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 3.

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 3 as modified by Chapter 5.

1-4 Equivalency.

1-4.1* 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 technical documentation is submitted to the authority having jurisdiction to demonstrate equivalency and the system, method, or device is approved for the intended purpose.

1-4.2* 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.

1-5.1 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 If a value for measurement as given in this *Code* is followed by an equivalent value in other units, the first stated value shall be regarded as the requirement. A given equivalent value might be approximate.

1-5.3 The conversion procedure used for the SI units was to multiply the quantity by the conversion factor and then round the result to the appropriate number of significant digits.

1-6 Mixed Occupancies.

1-6.1 Mixed Occupancies. Where the means of egress of two or more classes of occupancy are intermingled in the same building or structure, then the means of egress shall comply with the most restrictive requirements of the occupancies involved.

1-6.2 Special Mixed Occupancy Provisions for Health Care Occupancies.

1-6.2.1 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 3-2.4.

1-6.2.2 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.

1-6.2.3 Non–health care related occupancies classified as containing high-hazard contents shall not be permitted in buildings housing health care occupancies.

1-6.3 Special Mixed Occupancy Provisions for Detention and Correctional Occupancies.

1-6.3.1 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.

1-6.3.2 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 3-2.4.

1-6.3.3 Nondetention or noncorrectional related occupancies classified as containing high-hazard contents shall not be permitted in buildings housing detention or correctional occupancies.

1-6.4 Special Mixed Occupancy Provisions for Residential Occupancies.

1-6.4.1 No dwelling unit of a residential occupancy shall have its sole means of egress pass through any assembly, business, or mercantile occupancy in the same building.

1-6.4.2 No multiple dwelling unit of a residential occupancy shall be located above an assembly, business, or mercantile occupancy.

Exception No. 1: Where the dwelling unit of the residential occupancy and exits therefrom are separated from the assembly, business, or mercantile occupancy by construction having a fire resistance rating of at least 1 hour.

Exception No. 2: Where the assembly, business, or mercantile occupancy is protected throughout by an approved, supervised automatic sprinkler system.

1-7 Hazard of Contents.

1-7.1 General.

1-7.1.1 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.

1-7.1.2 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.

1-7.1.3 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*.

Exception: Where hazardous areas are separated or protected as required by the building code.

1-7.2 Classification of Hazard of Contents.

1-7.2.1 The hazard of contents of any building or structure shall be classified as low, ordinary, or high in accordance with 1-7.2.2, 1-7.2.3, and 1-7.2.4.

1-7.2.2 Low Hazard. Low-hazard contents shall be classified as those of such low combustibility that no self-propagating fire therein can occur.

1-7.2.3* 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.

1-7.2.4* 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 3-11.)*

Chapter 2 Definitions

2-1 General.

2-1.1 The terms defined in Section 2-2, for the purposes of this *Code*, shall have the meanings given in this chapter, if not otherwise modified for a specific occupancy.

2-1.2 Words used in the present tense shall include the future; words used in the masculine gender shall include the feminine; the singular number shall include the plural and the plural the singular.

2-1.3 Where terms are not defined in this chapter, they shall have their ordinarily accepted meanings or such as the context implies.

2-2 Definitions.

Access Openings. A window, panel, or similar opening that meets the following criteria:

(a) The opening has minimum dimensions of not less than 22 in. (55.9 cm) in width and 24 in. (61 cm) in height and is unobstructed to allow for ventilation and rescue operations from the exterior.
(b) The bottom of the opening is not more than 44 in. (112 cm) above the floor.
(c) The opening is readily identifiable from both the exterior and interior.
(d)*The opening is readily opened from both the exterior and interior.

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 and that complies with the accessible route requirements of ICC/ANSI A117.1, *American National Standard for Accessible and Usable Buildings and Facilities.*

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

Ambulatory Health Care Facilities. A building or part of a building that is used to provide services or treatment to four or more patients at the same time and that meets the criteria of either (a) or (b):

(a) Facilities that provide, on an outpatient basis, treatment for patients incapable of taking action for self-preservation under emergency conditions without assistance from others.
(b) Facilities that provide, on an outpatient basis, surgical treatment that requires general anesthesia.

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

Approved.* Acceptable to the authority having jurisdiction.

Area. See *Floor Area, Gross,* and *Floor Area, Net.*

Area of Refuge.* An area of refuge is defined by either (a) or (b):

(a) A story in a building where such building is protected throughout by an approved, supervised automatic sprinkler system and has at least two accessible rooms or spaces separated from each other by smoke-resisting partitions
(b) A space, 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 vir-

tue of location, thereby permitting a delay in egress travel from any level.

Authority Having Jurisdiction.* The organization, office, or individual responsible for approving equipment, an installation, or a procedure.

Automatic. Providing a function without the necessity of human intervention.

Birth Center.* A facility in which low-risk births are planned to occur following normal, uncomplicated pregnancy, and which provides professional midwifery care to women during pregnancy, birth, and postpartum.

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

Building. Any structure used or intended for supporting or sheltering any use or occupancy. The term *building* is construed as if followed by the words "or portions thereof."

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 12 ft (3.7 m) in storage height.

Class A Store. All stores that have an aggregate gross area of more than 30,000 ft^2 (2800 m^2) or that use more than three levels, excluding mezzanines, for sales purposes.

Class B Store.* All stores of more than 3000 ft^2 (280 m^2) but not more than 30,000 ft^2 (2800 m^2) aggregate gross area, or that use floors above or below the street floor level for sales purposes.

Class C Store. All stores of not more than 3000 ft^2 (280 m^2) gross area that use a maximum of one story or one story and mezzanines for sales purposes.

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

Conversion. A change of occupancy from an existing residential or health care occupancy to a residential board and care occupancy.

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

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

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.

Covered Mall Building. A building, including the covered mall, enclosing a number of tenants and occupancies, such as retail stores, drinking and dining establishments, entertainment and amusement facilities, offices, and other similar uses, wherein two or more tenants have a main entrance into the covered mall.

Day-Care Home. A building or part of a building in which more than 3 but not more than 12 clients receive care, maintenance, and supervision from other than their relative(s) or legal guardian(s) for less than 24 hours per day.

Direct Exit. An exit that serves only one area; the direct exit has no openings to *other* areas.

Dwelling Unit. A single unit in a residential occupancy that provides complete, independent living facilities for one or more persons, including permanent provisions for living, sleeping, eating, cooking, and sanitation.

Evacuation Capability.* The ability of the occupants, residents, and staff of a residential board and care occupancy as a group either to evacuate a building or to relocate from the point of occupancy to a point of safety. If the occupants include family members of the owners or operators, it is intended that the needs of the family members be considered in determining evacuation capability.

The levels of evacuation capability are as follows:

(a) *Prompt.* 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.

(b) *Slow.* 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.

(c) *Impractical.* The inability of a group to reliably move to a point of safety in a timely manner.

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

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

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

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

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

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

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

Exterior Stair. See *Outside Stairs.*

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.

Festival Seating. That 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 some performance.

Fire Exit Hardware. A door-latching assembly incorporating a device that releases the latch upon the application of a force in the direction of egress travel and provides fire protection where used as part of a fire door assembly.

Fire Protection Rating. The designation indicating the duration of the fire test exposure to which a fire door assembly or fire window assembly was exposed and successfully met all the acceptance criteria as determined in accordance with NFPA 252, *Standard Methods of Fire Tests of Door Assemblies*, or NFPA 257, *Standard on Fire Test for Window and Glass Block Assemblies*, respectively.

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*.

Flexible Plan and Open Plan Educational Occupancy or Day-Care Buildings. These include a building or portion of a building designed for multiple teaching stations.

Flexible plan buildings have movable corridor walls and movable partitions of full-height construction with doors leading from rooms to corridors.

Open plan buildings have rooms and corridors delineated by tables, chairs, desks, bookcases, counters, low-height [maximum 5-ft (1.5-m)] partitions, or similar furnishings.

Floor Area, Gross.* 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.

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

General Industrial Occupancy.* Ordinary- and low-hazard industrial operations conducted in buildings of conventional design suitable for various types of industrial processes.

Grandstand. A structure that provides tiered or stepped seating.

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

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

Group Day-Care Home. A day-care home in which at least 7 but not more than 12 clients receive care, maintenance, and supervision from other than their relative(s) or legal guardian(s) for less than 24 hours per day.

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

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

Hazardous Area. Those areas of structures or buildings posing a degree of hazard greater than that normal to the general occupancy of a 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.

High-Hazard Industrial Occupancy. Buildings that have high-hazard materials, processes, or contents, excluding incidental high-hazard operations in low- or ordinary-hazard industrial occupancies that are protected in an approved manner.

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

Horizontal Exit.* A path of passage from one building to an area of refuge in another building on approximately the same level, or a path 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.

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

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.

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.

Limited Care Facility. A building or part 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 mental limitations.

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 identified standards or has been tested and found suitable for a specified purpose.

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.

Means of Egress.* A continuous and unobstructed path of travel from any point in a building or structure to a public way that consists of the following separate and distinct parts:

(a) Exit access
(b) Exit
(c) Exit discharge

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

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

Nursing Home. A building or part 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.

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

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

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.

Open-Air Parking Structure. A parking structure that has wall openings at each parking level, open to the atmosphere, for an area of not less than 1.4 ft^2 (0.13 m^2) for each lineal foot (0.3 m) of its exterior perimeter. Such openings are distributed over 40 percent of the building perimeter or are distributed uniformly over two opposing sides at each parking level of the building. Interior wall lines and column lines are at least 20 percent open with openings distributed to provide ventilation.

Open Structure. Structures supporting equipment and operations not enclosed within building walls.

Outside Stairs. Stairs for which at least one side is open to the outside air.

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.

Personal Care. The care of residents in a residential board and care occupancy who do not require chronic or convalescent medical or nursing care where such care involves responsibility for the safety of the resident while inside the building.

Point of Safety. A location in a residential board and care occupancy that meets one of the following criteria:

(a) It is exterior to and away from the building
(b) It is within a building of any type construction that is protected throughout by an approved, automatic sprinkler system and is either
    1. Within an exit enclosure, or
    2. Within another portion of the building that is separated by smoke barriers having at least a $^1/_2$-hour fire resistance rating, and that portion of the building has access to a means of escape or exit and that does not require return to the area of fire involvement.
(c) It is within a building that has a minimum 1-hour fire resistance–rated construction and is either
    1. Within an exit enclosure, or
    2. Within another portion of the building that is separated by smoke barriers having at least a $^1/_2$-hour fire resistance rating, and that portion of the building has access to a means of escape or exit that does not require return to the area of fire involvement.

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

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

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

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

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

Sally Port (Security Vestibule). A compartment that is 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.

Self-Closing. Equipped with an approved device that will ensure closing after having been opened.

Self-Preservation.* A day-care occupancy client who is capable of self-preservation is one who can evacuate the building without direct intervention by a staff member.

Separate Atmosphere (Educational Occupancy and Day-Care Occupancy). The atmosphere that exists between rooms, spaces, or areas that are separated by an approved smoke barrier.

Shall. Indicates a mandatory requirement.

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

Smoke Barrier.* A continuous membrane, either vertical or horizontal, such as a wall, floor, or ceiling assembly, that is designed and constructed to restrict the movement of smoke.

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

Special Amusement Building. Any building that is temporary, permanent, or mobile and that 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.

Special-Purpose Industrial Occupancy. Ordinary- and low-hazard industrial operations 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.

Story. That portion of a building included between the upper surface of a floor and the upper surface of the floor or roof next above.

Street Floor. Any story or floor level accessible from the street or from outside the building at ground level with floor level at the main entrance not more than three risers above or below ground level at these points, and arranged and used to qualify as the main floor. If, due to differences in street levels, there are two or more stories accessible from the street, then each is a street floor. If there is no floor level within the specified limits for a street floor above or below ground level, then the building is considered as having no street floor.

Structure. That which is built or constructed. The term *structure* is construed as if followed by the words "or portion thereof."

Thermal Barrier. A material that limits the average temperature rise of the unexposed surface to not more than 250°F (120°C) for a specified fire exposure complying with the standard time-temperature curve.

Tower. An enclosed independent structure or portion of a building with elevated levels for support of equipment or that is occupied for observation, control, operation, signaling, or similar limited use under the following conditions:

(a) The elevated levels are provided to allow adequate observation or line-of-sight for personnel or equipment.

(b) Levels within the tower below the observation level and equipment room for that level are not occupied.

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

Use Condition I — Free Egress — Detention and Correctional Occupancy. Free movement is allowed from sleeping areas and other spaces where access or occupancy is permitted to the exterior via means of egress that meet the necessary requirements.

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.

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.

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.

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.

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

Windowless Structure. A structure or portions of a structure that lack access openings detailed as follows:

(a) A one-story structure or portion thereof is not considered a windowless structure if the story is provided with grade level doors or access openings on two sides of the building spaced not more than 125 ft (38 m) apart in the exterior walls.

(b) A structure or portion thereof that is more than one story in height is not considered a windowless structure under the following conditions:

1. Access openings are provided on the first story as required by (a).
2. Every story above the first floor is provided with access openings on two sides of the building, spaced not more than 30 ft (9.1 m) apart.

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 3 New Construction

NOTICE: A dagger (†) following the number or letter designating a paragraph indicates that an exemption to that new construction requirement can be found in Chapter 5 for application to alterations, repairs, or change of occupancy in existing structures.

3-1* General.

3-1.1 Separation of Means of Egress.

3-1.1.1* Exit Access Corridors.

3-1.1.1.1 Corridors used as exit access and that serve an area having an occupant load of more than 30 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.

Exception No. 1: In assembly occupancies, 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.

Exception No. 2: In assembly occupancies, corridor and lobby protection shall not be required in buildings protected throughout by an approved, supervised automatic sprinkler system.

Exception No. 3: In assembly occupancies, 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 3-5.1.7.)

Exception No. 4: In educational occupancies, corridor protection shall not be required if 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.

Exception No. 5: In educational occupancies, 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 openings therein and ceilings at which they terminate, resist the passage of smoke.

Exception No. 6: In educational occupancies, 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.

Exception No. 7: In health care occupancies as specified in 3-1.1.1.2.

Exception No. 8: In detention and correctional occupancies as specified in 3-5.1.28.

Exception No. 9: In hotels, dormitories, or apartment buildings, in buildings protected throughout by an approved, supervised automatic sprinkler system, corridor walls shall have a minimum $^1/_2$-hour fire resistance rating.

Exception No. 10: In hotels, dormitories, or apartment buildings, spaces shall be permitted to be unlimited in area and open to the corridor under the following conditions:

(a) The spaces are not used for guest rooms or guest suites, dwelling units, or hazardous areas.

(b) The building is protected throughout by an approved, supervised automatic sprinkler system.

(c) The space does not obstruct access to required exits.

Exception No. 11: 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 air 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 buildings, doors shall be self-closing or automatic-closing upon detection of smoke.

Exception No. 12: In large residential board and care occupancies as specified in 3-1.1.1.3.

Exception No. 13: In mercantile and business occupancies where exits are available from an open floor area.

Exception No. 14: In mercantile and business occupancies, corridors shall not be required to have a fire resistance rating within a space occupied by a single tenant.

Exception No. 15: In mercantile and business occupancies, corridors shall not be required to have a fire resistance rating within buildings protected throughout by an approved, automatic sprinkler system.

Exception No. 16: In industrial and storage occupancies, the provisions of 3-1.1.1.1 shall not apply.

Exception No. 17: In 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 20 in.^{2} (135 cm^2) 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 80 in. (520 cm^2).

3-1.1.1.2 Health Care Occupancy Exit Access Corridors.

3-1.1.1.2.1 Health care occupancy corridors shall be separated from all other areas by partitions complying with 3-1.1.1.2.2 through 3-1.1.1.2.5.

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

(a) The spaces are not used for patient sleeping rooms, treatment rooms, or hazardous areas.

(b) 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.

(c) 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.

(d) 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:

(a) The aggregate waiting area in each smoke compartment does not exceed 600 ft^2 (55.7 m^2).

(b) 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.

(c) 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 multipurpose therapeutic spaces shall be permitted to open to the corridor under the following conditions:

(a) The space is not a hazardous area.

(b) 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.

(c) The area does not obstruct access to required exits.

3-1.1.1.2.2* 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.

3-1.1.1.2.3* Health Care Occupancy Corridor Doors.

3-1.1.1.2.3.1* Doors protecting corridor openings shall be constructed to resist the passage of smoke.

Exception: Doors to toilet rooms, bathrooms, shower rooms, sink closets, and similar auxiliary spaces that do not contain flammable or combustible materials.

3-1.1.1.2.3.2 Doors shall be provided with positive latching hardware. Roller latches shall be prohibited.

Exception: Doors to toilet rooms, bathrooms, shower rooms, sink closets, and similar auxiliary spaces that do not contain flammable or combustible materials.

3-1.1.1.2.3.3 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.

3-1.1.1.2.3.4 Nonrated, factory- or field-applied protective plates extending not more than 48 in. (122 cm) above the bottom of the door shall be permitted.

3-1.1.1.2.3.5 Dutch doors shall be permitted where they conform to 3-1.1.1.2.3, and both upper leaf and lower leaf are equipped with a latching device, and the meeting edges of the upper and lower leaves are equipped with an astragal, rabbet, or bevel.

3-1.1.1.2.4 Health Care Occupancy Corridor Transfer Grilles. Transfer grilles, whether or not 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.

3-1.1.1.2.5 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 80 in.^{2} (520 cm^2) and the openings are installed at or below half the distance from the floor to the room ceiling.

3-1.1.1.3 Large Residential Board and Care Occupancy Means of Egress Corridors.

3-1.1.1.3.1 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 3-1.1.1.3.3 through 3-1.1.1.3.6.

3-1.1.1.3.2 Sleeping rooms shall be separated from corridors, living areas, and kitchens by walls complying with 3-1.1.1.3.3 through 3-1.1.1.3.6.

3-1.1.1.3.3 Walls required by 3-1.1.1.3.1 or 3-1.1.1.3.2 shall have a fire resistance rating of not less than $^1/_2$ hour.

Exception: In conversions no fire resistance rating shall be required, but the wall shall resist the passage of smoke. (See definition of Conversion in Section 2-2.)

3-1.1.1.3.4† Doors in walls required by 3-1.1.1.3.1 or 3-1.1.1.3.2 shall have a fire protection rating of not less than 20 minutes.

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

3-1.1.1.3.5 Walls and doors required by 3-1.1.1.3.1 and 3-1.1.1.3.2 shall be constructed to resist the passage of smoke. There shall be no louvers, transfer grilles, operable transoms, or other air passages penetrating such walls or doors.

Exception: Properly installed heating and utility installations.

3-1.1.1.3.6 Doors in walls required by 3-1.1.1.3.1 and 3-1.1.1.3.2 shall be self-closing or automatic-closing in accordance with 3-2.1.8. Doors in walls separating sleeping rooms from corridors shall be automatic-closing in accordance with 3-2.1.8.

Exception No. 1: Doors to sleeping rooms that have occupant control locks such that access is normally restricted to the occupants or staff personnel shall be permitted to be self-closing.

Exception No. 2: In buildings protected throughout by an approved, automatic sprinkler system, doors, other than doors to hazardous areas, vertical openings, and exit enclosures shall not be required to be self-closing or automatic-closing.

3-1.1.2 Exits.

3-1.1.2.1 Where an exit is required in this *Code* to be separated from other parts of the building, the separating construction shall meet the following requirements:

(a) The separation shall have at least a 1-hour fire resistance rating where the exit connects three stories or less. Opening protectives shall have a minimum 1-hour fire protection rating.

(b) The separation shall have at least a 2-hour fire resistance rating where the exit connects four or more stories. It shall be supported by construction having at least a 2-hour fire resistance rating. Opening protectives shall have a minimum $1^1/_2$-hour fire protection rating.

Exception to (b): 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 3-2.1.8.

(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 to (d): 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 3-1.1.2.*
2. *Such rooms or areas shall be protected by an approved, 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 3-2.1.5.3 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 to (e): 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.

3-1.1.2.2 An exit enclosure shall provide a continuous protected path of travel to an exit discharge.

3-1.1.2.3* 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 3-2.2.5.3.)*

3-1.1.3† Exit Passageways. An exit passageway that serves as a discharge from a stair enclosure shall have at least the same fire resistance rating and opening protective fire protection rating as that required for the stair enclosure, and shall be separated from other parts of the building in accordance with 3-1.1.2.

3-1.2 Headroom. Means of egress shall be designed and maintained to provide headroom as provided in other sections of this *Code* and shall be at least 7 ft 6 in. (2.3 m) with projections from the ceiling at least 6 ft 8 in. (2 m) nominal height above the finished floor. Headroom on stairs shall be a minimum of 6 ft 8 in. (2 m) 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 minimum headroom of 6 ft 8 in. (2 m).

3-1.3 Changes in Level in Means of Egress.

3-1.3.1 Changes in level in means of egress shall be either by a ramp or a stair if the elevation difference is more than 12 in. (30.5 cm).

3-1.3.2* Changes in level in means of egress not more than 12 in. (30.5 cm) shall be either by a ramp or by a stair that complies with the requirements of 3-2.2. The presence and location of ramped portions of walkways shall be readily apparent. The minimum tread depth of such stair shall be 13 in. (33 cm), and the presence and location of each step shall be readily apparent.

3-1.4 Guards. Guards in accordance with 3-2.2.4 shall be provided at the open sides of means of egress that are more than 30 in. (76 cm) above the floor or grade below.

3-1.5 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 3-2.1.6.

Exception No. 2: As provided for health care occupancies and detention and correctional occupancies in 3-2.1.

3-2 Means of Egress Components.

3-2.1 Doors.

3-2.1.1 General.

3-2.1.1.1 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 3-1 and to the special requirements of 3-2.1. Such an assembly shall be designated as a *door.*

3-2.1.1.2 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.

3-2.1.1.3* For the purposes of Section 3-2, 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.

3-2.1.2 Egress Width.

3-2.1.2.1* In determining the egress width for a doorway 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 shall be the net, unobstructed width of the door opening without projections into such width.

3-2.1.2.2 Door openings in means of egress shall be at least 32 in. (81 cm) in clear width. Where a pair of doors is provided, at least one of the doors shall provide at least a 32 in. (81 cm) clear width opening.

Exception No. 1: Exit access doors serving a room not larger than 70 ft^2 (6.5 m^2) and not required to be accessible to persons in wheelchairs shall be at least 24 in. (61 cm) in door width.

Exception No. 2: In detention and correctional occupancies, door openings to resident sleeping rooms shall be a minimum of 28 in. (71 cm) in clear width.

Exception No. 3: Doors within dwelling units shall be a minimum 28 in. (71 cm) wide, except bathroom doors shall be a minimum 24 in. (61 cm) wide.

Exception No. 4: A power-operated door leaf located within a two-leaf opening shall be exempt from the minimum 32-in. (81-cm) single-leaf requirement in accordance with Exception No. 2 to 3-2.1.9.

3-2.1.2.3 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 follows:

(a) Hospitals and nursing homes — 41.5 in. (105 cm)

(b) Psychiatric hospitals and limited care facilities — 32 in. (81 cm)

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 32 in. (81 cm) in clear width.

Exception No. 2: Doors in exit stair enclosures shall be not less than 32 in. (81 cm) in clear width.

Exception No. 3: Doors serving newborn nurseries shall be not less than 32 in. (81 cm) in clear width.

Exception No. 4: Where a pair of doors is provided, at least one of the doors shall provide a minimum 32 in. (81 cm) 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.

3-2.1.3† Floor Level. The elevation of the floor surfaces on both sides of a door shall not vary by more than $^1/_2$ in. (13 mm). The elevation shall be maintained on both sides of the doorway for a distance at least equal to the width of the widest leaf. Thresholds at doorways shall not be more than $^1/_2$ in. (13 mm) in height. Raised thresholds and floor level changes more than $^1/_4$ in. (6.4 mm) at doorways shall be beveled with a slope not steeper than 1 in 2.

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 not more than 7 in. (17.8 cm) 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 if the door does not swing over the stair and the door serves an area with an occupant load of fewer than 50 persons.

3-2.1.4 Swing and Force to Open.

3-2.1.4.1* 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 50 lbf (222 N) with a perpendicular force against the door of 50 lbf (222 N).

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

Exception No. 3: Security grilles as specified in 3-2.1.4.2.

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 3-2.1.14.

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.

Exception No. 7: Revolving doors that comply with 3-2.1.10.

3-2.1.4.2 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 3-2.1.4.2 under the following conditions:

(a) They remain secured in the full open position during the period of occupancy by the general public.

(b) On or adjacent to the door, there is a readily visible, durable sign in letters at least 1 in. (2.5 cm) high on a contrasting background that reads as follows:

THIS DOOR TO REMAIN OPEN WHEN
THE BUILDING IS OCCUPIED.

(c) Doors or grilles are not brought to the closed position when the space is occupied.

(d) Doors or grilles are operable from within the space without the use of any special knowledge or effort.

(e) Where two or more means of egress are required, not more than half of the means of egress are equipped with horizontal sliding or vertical rolling grilles or doors.

Table 3-2.1.4.2 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

3-2.1.4.3 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.

3-2.1.4.4 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.

3-2.1.4.5* During its swing, any door in a means of egress shall not obstruct more than one-half of the required width of an aisle, corridor, passageway, or landing nor project more than 7 in. (17.8 cm) into the required width of an aisle, corridor, passageway, or landing when fully open.

3-2.1.4.6 In educational occupancies, doors that swing into an exit access corridor shall be recessed to prevent interference with corridor traffic; any doors that are not recessed shall open 180 degrees to stop against the wall. Doors in any position shall not reduce the required corridor width by more than one-half.

3-2.1.4.7 The forces required to fully open any door manually in a means of egress shall not be more than 15 lbf (67 N) to release the latch, 30 lbf (133 N) to set the door in motion, and 15 lbf (67 N) 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 5 lbf (22 N). 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 3-2.1.4.1.

Exception No. 2: Power-operated doors as specified in 3-2.1.9.

3-2.1.5 Locks, Latches, and Alarm Devices.

3-2.1.5.1 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 3-2.1.5.2.

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 2-2; see also 3-2.1.6.3.)

3-2.1.5.2 Exterior doors for the occupancies shown in Table 3-2.1.5.2 shall be permitted to have key-operated locks from the egress side under the following conditions:

(a) On or adjacent to the door, there is a readily visible, durable sign in letters at least 1 in. (2.5 cm) high on a contrasting background that reads as follows:

THIS DOOR TO REMAIN OPEN WHEN
THE BUILDING IS OCCUPIED.

(b) The locking device is of a type that is readily distinguishable as locked.

(c) 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.

Table 3-2.1.5.2 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

3-2.1.5.3* 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:

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

(b) There are not more than four stories intervening between stories where it is possible to leave the stair enclosure.

(c) Reentry is possible on the top or next to top story permitting access to another exit.

(d) Doors permitting reentry are identified as such on the stair side of the door.

(e) 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.

3-2.1.5.4* A latch or other fastening device on a door shall be provided with a releasing device that is readily operable and has an obvious method of operation under required lighting conditions. The releasing mechanism for any latch shall be located at least 34 in. (86 cm) and not more than 48 in. (122 cm) above the finished floor. Doors shall be openable 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 more than 48 in. (122 cm) above the finished floor. Automatic latching devices shall not be located more than 48 in. (122 cm) above the finished floor.*

3-2.1.5.5 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.

3-2.1.5.6* 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 3-2.1.6.

3-2.1.6 Special Locking Arrangements.

3-2.1.6.1 Delayed Egress Locks. In occupancies shown in Table 3-2.1.6.1, 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 under the following conditions:

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

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

(c) The doors unlock upon disablement of the automatic fire detection system, sprinkler system, or the means of sprinkler system supervision protecting the building area served by the door(s).

(d)* An irreversible process releases the lock within 15 seconds when a force is applied to the release device required in 3-2.1.5.4. 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 15 lbf (67 N). 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 to (d): Where approved by the authority having jurisdiction, a delay of not more than 30 seconds shall be permitted.

(e)* On the door adjacent to the release device, there is a readily visible, durable sign in letters at least 1 in. (2.5 cm) high and at least $^1/_8$ in. (0.3 cm) in stroke width on a contrasting background that reads as follows:

PUSH UNTIL ALARM SOUNDS. DOOR
CAN BE OPENED IN 15 SECONDS.

Table 3-2.1.6.1 Occupancies Permitting Delayed Egress Locks

Occupancy	Condition
Assembly	Doors other than main entrance/exit
Educational	—
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	—
Day care	—

3-2.1.6.2 Access-Controlled Egress Doors. In occupancies shown in Table 3-2.1.6.2, doors in the means of egress shall be permitted to be equipped with an approved entrance and egress access control system under the following conditions:

(a) A sensor is provided on the egress side arranged to detect an occupant approaching the doors and the doors are arranged to unlock upon detection of an approaching occupant or loss of power to the sensor.

(b) Loss of power to that part of the access control system that locks the doors automatically unlocks the doors.

(c) The doors are arranged to unlock from a manual release device located 40 in. (102 cm) to 48 in. (122 cm) vertically above the floor and within 5 ft (1.5 m) 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.

(d) Activation of the building fire-protective signaling system, if provided, automatically unlocks the doors, and the doors remain unlocked until the fire-protective signaling system has been manually reset.

(e) Activation of the building automatic sprinkler or fire detection system, if provided, automatically unlocks the doors, and the doors remain unlocked until the fire-protective signaling system has been manually reset.

Table 3-2.1.6.2 Occupancies Permitting Access-Controlled Egress Doors

Occupancy	Condition
Assembly	Doors not locked from egress side when assembly occupancy is occupied
Educational	—
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	—
Day care	—

3-2.1.6.3 Locking Provisions for Detention and Correctional Occupancies.

3-2.1.6.3.1 Doors from areas of refuge to the exterior shall be permitted to be locked with key locks in lieu of locking methods described in 3-2.1.6.3.2. 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.

3-2.1.6.3.2* 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 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 3-13.3 for requirements for smoke barrier doors.)

3-2.1.6.3.3 All remote-controlled release-operated doors shall be provided with a redundant means of operation as follows:

(a) 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 3-9.2.2 is provided for the power operation or a remote-controlled manual mechanical release is provided.

(b) 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.

3-2.1.6.3.4 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.

3-2.1.6.3.5 Emergency power shall be provided for all electrically power-operated sliding doors and power-operated 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 $1^1/_2$ hours.

Exception: This provision shall not be applicable for facilities with 10 or fewer locks that comply with the Exception to 3-2.1.6.3.2.

3-2.1.7 Panic Hardware and Fire Exit Hardware.

3-2.1.7.1 In the occupancies shown in Table 3-2.1.7.1, doors shall be equipped with panic or fire exit hardware. Such a releasing device shall meet the following criteria:

(a)† Consist of bars or panels, the actuating portion of which extends across at least one-half of the width of the door leaf, at least 34 in. (86 cm) and not more than 48 in. (122 cm) above the floor

(b) Cause the door latch to release when a force that shall not be required to exceed 15 lbf (67 N) is applied

Table 3-2.1.7.1 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

3-2.1.7.2 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.

3-2.1.7.3 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 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.

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

3-2.1.8 Self-Closing Devices.

3-2.1.8.1* A door that is designed to normally be kept closed in a means of egress shall be self-closing and shall not be secured in the open position by any means.

Exception: Automatic-closing doors in accordance with 3-2.1.8.2 shall be permitted.

3-2.1.8.2 In any building of low- or ordinary-hazard contents, as defined in Section 1-7, or where approved by the authority having jurisdiction, doors shall be permitted to be automatic-closing under the following conditions:

(a) Upon release of the hold-open mechanism, the door becomes self-closing.

(b) The release device is designed so that the door instantly releases manually and upon release becomes self-closing, or the door readily closes.

(c) The automatic releasing mechanism or medium is activated by (1) the operation of an approved, automatic smoke detection system installed to protect the entire building, designed and installed to provide for actuation of the system promptly so as to preclude the generation of heat or smoke sufficient to interfere with egress before the system operates, or (2) the operation of approved smoke detectors installed in such a way as to detect smoke on either side of the door opening. The above systems shall be permitted to be zoned where approved by the authority having jurisdiction.

(d) Upon loss of power to the hold-open device, the hold-open mechanism is released and the door becomes self-closing.

(e) The release by means of smoke detection of one door in a stair enclosure results in the closing of all doors serving that stair.

(f) In health care occupancies, the automatic sprinkler system, the fire alarm system, and the systems listed in (c) shall be arranged to initiate the closing action of all such doors by zone or throughout the entire facility.

(g) In ambulatory health care facilities, the systems listed in (c) shall be arranged to initiate the closing action of all such doors by zone or throughout the entire facility.

3-2.1.9* Power-Operated Doors. Where means of egress doors are operated by power upon the approach of a person or doors with power-assisted manual operation, the design shall be such that in the event of power failure, the door opens manually to permit egress travel or closes where necessary to safeguard the means of egress. The forces required to open these doors manually shall not be more than required in 3-2.1.4.7 except that the force required to set the door in motion shall not be more than 50 lbf (222 N). 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 required width of the opening in which it is installed. *(See 3-2.1.4.)* 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 1 in. (2.5 cm) high on a contrasting background.

Exception No. 1: Sliding, power-operated doors in an exit access that serves an occupant load of fewer than 50 and that manually opens in the direction of door travel with forces not more than required in 3-2.1.4.7 shall not be required to have a swing-out feature. The required sign shall state "In Emergency, Slide 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 32-in. (81-cm) single-leaf requirement of 3-2.1.2.2 if the clear width of the single leaf is at least 30 in. (76 cm).*

Exception No. 3: For a biparting sliding door in the emergency break-out mode, a door leaf located within a multiple-leaf opening shall be exempt from the minimum 32-in. (81-cm) single-leaf requirement of 3-2.1.2.2 if a minimum of 32 in. (81 cm) clear opening is provided by all leafs broken out.

Exception No. 4: Horizontal sliding doors that comply with 3-2.1.14.

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

3-2.1.10 Revolving Doors.

3-2.1.10.1 Revolving doors shall comply with the following:

(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 36 in. (91 cm).

(c) Revolving doors shall not be used within 10 ft (3 m) 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 3-2.1.10.1.

Table 3-2.1.10.1 Revolving Door Revolution Speed Limitations

Inside Diameter	Power Driven-Type Speed Control (rpm)	Manual-Type Speed Control (rpm)
6 ft 6 in. (2.0 m)	11	12
7 ft 0 in. (2.1 m)	10	11
7 ft 6 in. (2.3 m)	9	11
8 ft 0 in. (2.4 m)	9	10
8 ft 6 in. (2.6 m)	8	9
9 ft 0 in. (2.7 m)	8	9
9 ft 6 in. (2.9 m)	7	8
10 ft 0 in. (3.0 m)	7	8

(e) Each revolving door shall have a conforming side-hinged swinging door in the same wall as the revolving door and within 10 ft (3 m) of the revolving door.

Exception to (e): 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 the lobby has no occupancy other than as a means of travel between elevators and street.

3-2.1.10.2 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:

(a) Revolving doors are not given credit for more than 50 percent of the required egress capacity.

(b) Each revolving door is credited with not more than a 50-person capacity.

Exception to (b): Revolving doors with at least a 9-ft (2.7-m) diameter shall be permitted egress capacity based on the clear opening width created when the door is collapsed into a book-fold position.

(c) Revolving doors are capable of being collapsed into a book-fold position when a force of not more than 130 lbf (578 N) is applied to wings within 3 in. (7.6 cm) of the outer edge.

3-2.1.10.3 Revolving doors that are not used as a component of a means of egress shall have a collapsing force of not more than 180 lbf (800 N).

Exception: Revolving doors, provided that the collapsing force is reduced to not more than 130 lbf (578 N) under the following conditions:

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

(b) There is actuation of the automatic sprinkler system where such a system is provided.

(c) There is actuation of a smoke detection system that is installed to provide coverage in all areas within the building that are within 75 ft (23 m) of the revolving doors.

(d) There is actuation of a clearly identified manual control switch in an approved location that reduces the holding force to not more than 130 lbf (578 N).

3-2.1.11 Turnstiles.

3-2.1.11.1 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 more than 39 in. (99 cm) high that turn freely in the direction of egress travel shall be permitted where revolving doors are permitted in 3-2.1.10.2.

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:

(a) Freewheel in the egress direction when primary power is lost and freewheel in the direction of egress travel upon the manual release by an employee assigned in the area

(b) Are not given credit for more than 50 percent of the required egress width

(c) Are not more than 39 in. (99 cm) high and have a clear width of at least $16^1/_2$ in. (41.9 cm)

3-2.1.11.2 Turnstiles more than 39 in. (99 cm) high shall meet the requirements for revolving doors.

3-2.1.11.3 Turnstiles in or furnishing access to required exits shall provide at least $16^1/_2$ in. (41.9 cm) clear width at and below a height of 39 in. (99 cm) and at least 22 in. (55.9 cm) clear width at heights above 39 in. (99 cm).

3-2.1.12 Doors in Folding Partitions. If permanently mounted folding or movable partitions divide a room into smaller spaces, then 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:

(a) The subdivided space is not used by more than 20 persons at any time.

(b) The use of the space is under adult supervision.

(c) 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.

(d) The partitions conform to the interior finish and other requirements of this Code.

(e) 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: If a subdivided space is provided with at least two means of egress, then 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 3-2.1.14.

3-2.1.13 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 3-2.1.7.1(a).]*

3-2.1.14 Horizontal Sliding Doors.

3-2.1.14.1 Horizontal sliding doors shall be permitted in means of egress under the following conditions:

(a) The door is readily operable from either side without special knowledge or effort.

(b) The force, applied to the operating device in the direction of egress, required to operate the door is not more than 15 lbf (67 N).

(c) The force required to operate the door in the direction of door travel is not more than 30 lbf (133 N) to set the door in motion and not more than 15 lbf (67 N) to close the door or open it to the minimum required width.

(d) The door is operable with a force not more than 50 lbf (222 N) when a force of 250 lbf (1110 N) is applied perpendicularly to the door adjacent to the operating device.

(e) The door assembly complies with the fire protection rating and, where rated, is self-closing or automatic-closing by smoke detection in accordance with 3-2.1.8.

(f) In apartment buildings, hotels, and dormitories, horizontal sliding doors shall not be used across corridors.

3-2.1.14.2 In health care occupancies, horizontal sliding doors, as permitted by 3-2.1.14.1, that are not automatic-closing shall be limited to a single leaf and shall have a latch or other mechanism that will ensure that doors will not rebound into a partially open position when closed.

3-2.2 Stairs.

3-2.2.1 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 3-1 and to the special requirements of 3-2.2.

Exception: Aisle steps in assembly occupancies as specified in 3-14.4.

3-2.2.2 Dimensional Criteria.

3-2.2.2.1† Standard Stairs. Stairs shall be in accordance with Table 3-2.2.2.1.

Table 3-2.2.2.1 Stair Criteria

Element	Dimension
Minimum width clear of all obstructions, except projections not more than $3^1/_2$ in. (8.9 cm) at or below handrail height on each side	44 in. (112 cm); 36 in. (91 cm) if total occupant load of all stories served by stairways is fewer than 50
Maximum height of risers	7 in. (17.8 cm)
Minimum height of risers	4 in. (10.2 cm)
Minimum tread depth	11 in. (27.9 cm)
Minimum headroom	6 ft 8 in. (203 cm)
Maximum height between landings	12 ft (3.7 m)
Landing	*(See 3-2.1.3 and 3-2.2.3.2.)*

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 minimum clear width of 22 in. (55.9 cm), minimum tread depth of 10 in. (25.4 cm), maximum riser height of 9 in. (22.9 cm), minimum headroom of 6 ft 8 in. (203 cm), and a maximum height between landings of 12 ft (3.7 m).

Exception No. 2: Maximum riser height of $7^3/_4$ in. (19.7 cm) and minimum tread depth of 10 in. (25.4 cm) shall be permitted for one- and two-family dwellings and within dwelling units.

3-2.2.2.2 Curved Stairs. Curved stairs shall be permitted as a component in a means of egress if the minimum depth of tread is 11 in. (27.9 cm) at a point 12 in. (30.5 cm) from the narrower end of the tread, and the smallest radius is at least twice the stair width.

3-2.2.2.3 Spiral Stairs. In the occupancies shown in Table 3-2.2.2.3, spiral stairs shall be permitted as a component in a means of egress under the following conditions:

(a) The occupant load served is not more than five persons.

(b) The clear width of the stairs is at least 26 in. (66 cm).

(c) The height of risers is not more than $9^1/_2$ in. (24.1 cm).

(d) Headroom is at least 6 ft 6 in. (198 cm).

(e) Treads have a minimum depth of $7^1/_2$ in. (19.1 cm) at a point 12 in. (30.5 cm) from the narrower edge.

(f) All treads are identical.

Table 3-2.2.2.3 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	—

3-2.2.2.4* Winders. In the occupancies shown in Table 3-2.2.2.4, winders shall be permitted in stairs. Winders shall have a minimum tread depth of 6 in. (15.2 cm) and a minimum depth of tread of 11 in. (27.9 cm) at a point 12 in. (30.5 cm) from the narrowest edge.

Table 3-2.2.2.4 Occupancies Permitting Winders

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

3-2.2.3 Stair Details.

3-2.2.3.1 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.

3-2.2.3.2 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 3-2.1.3.)* 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 4 ft (122 cm) 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.

3-2.2.3.3* Tread and Landing Surfaces. Stair treads and landings shall be solid, uniformly slip resistant, 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 be more than $1^1/_2$ in. (3.8 cm).

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

(a) Detentional and correctional occupancies

(b) Industrial occupancies

(c) Assembly occupancies in means of egress from lighting and access catwalks, galleries, and gridirons

3-2.2.3.4* Tread Slope. Tread slope shall not be more than $^1/_4$ in./ft (2 cm/m) (a slope of 1 in 48).

3-2.2.3.5* 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 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 be more than $^1/_2$ in. (1.3 cm) in horizontal dimension.

3-2.2.3.6 Dimensional Uniformity. There shall be no variation more than $^3/_{16}$ in. (0.5 cm) 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 be more than $^3/_8$ in. (1 cm) 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 of not more than 3 in. (7.6 cm) in every 3 ft (91 cm) of stairway width shall be permitted.

3-2.2.4 Guards and Handrails.

3-2.2.4.1* Guards. Means of egress that are more than 30 in. (76 cm) above the floor or grade below shall be provided with guards to prevent falls over the open side. *(See also 3-2.2.4.6.)*

3-2.2.4.2*† Handrails. Stairs and ramps shall have handrails on both sides. In addition, handrails shall be provided within 30 in. (76 cm) of all portions of the required egress width of stairs. The required egress width shall be along the natural path of travel. *(See also 3-2.2.4.5.)*

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.

3-2.2.4.3† 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.

3-2.2.4.4 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.

3-2.2.4.5* Handrail Details.

3-2.2.4.5.1† Handrails on stairs shall be at least 34 in. (86 cm) and not more than 38 in. (96 cm) above the surface of the tread, measured vertically to the top of the rail from the leading edge of the tread.

Exception No. 1: The height of required handrails that form part of a guard shall be permitted to be not more than 42 in. (107 cm) 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.*

3-2.2.4.5.2*† Handrails shall provide a clearance of at least $1^1/_2$ in. (3.8 cm) between the handrail and the wall to which it is fastened.

3-2.2.4.5.3*† Handrails shall have a circular cross section with an outside diameter of at least $1^1/_4$ in. (3.2 cm) and not more than 2 in. (5 cm). Handrails shall be continuously graspable along the entire length.

Exception No. 1: Any other shape with a perimeter dimension of at least 4 in. (10.2 cm), but not more than $6^1/_4$ in. (15.9 cm), and with the largest cross-sectional dimension not more than $2^1/_4$ in. (5.7 cm) shall be permitted provided that edges are rounded so as to provide a minimum radius of $^1/_8$ in. (0.3 cm).

Exception No. 2: Handrail brackets or balusters attached to the bottom surface of the handrail shall not be considered obstructions to graspability provided they do not project horizontally beyond the sides of the handrail within $2^1/_2$ in. (6.4 cm) of the bottom of the handrail, obstruct not more than 20 percent of the handrail length, and have edges with a $^1/_8$-in. (0.3-cm) minimum radius.

3-2.2.4.5.4† Handrail ends shall be returned to the wall or floor or shall terminate at newel posts.

3-2.2.4.5.5† Handrails that are not continuous between flights shall extend horizontally, at the required height, at least 12 in. (30.5 cm) beyond the top riser and continue to slope for a depth of one tread beyond the bottom riser.

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

3-2.2.4.6 Guard Details.

3-2.2.4.6.1 The height of guards required in 3-2.2.4.1 shall be measured vertically to the top of the guard from the surface adjacent thereto.

3-2.2.4.6.2† Guards shall be at least 42 in. (107 cm) high.

Exception: As specified in the assembly seating provisions of Section 3-14.

3-2.2.4.6.3*† Open guards shall have intermediate rails or an ornamental pattern such that a sphere 4 in. (10.1 cm) in diameter shall not pass through any opening up to a height of 34 in. (86 cm).

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 6 in. (15.2 cm) 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 be more than 21 in. (53.3 cm).

3-2.2.5 Enclosure and Protection of Stairs.

3-2.2.5.1 Enclosures. All inside stairs serving as an exit or exit component shall be enclosed in accordance with 3-1.1.2.

3-2.2.5.2*† Exposures. Where nonrated walls or unprotected openings enclose the exterior of a stairway and the

openings are exposed by other parts of the building at an angle of not more than 180 degrees, the building enclosure walls within 10 ft (3 m) 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 10 ft (3 m) above the topmost landing of the stairs or to the roofline, whichever is lower.

Exception: The fire resistance rating of the separation extending 10 ft (3 m) from the stairs shall not be required to be more than 1 hour with openings having a $^3/_4$-hour fire resistance rating.

3-2.2.5.3* 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 3-1.1.2.3.)

3-2.2.5.4* 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 located approximately 5 ft (1.5 m) above the floor landing in a position that is readily visible when the door is in the open or closed position.

3-2.2.5.5 Egress Direction Signs. If an enclosed stair requires travel in an upward direction to reach the level of exit discharge, then 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 3-2.2.5.4 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.

3-2.2.6 Special Provisions for Outside Stairs.

3-2.2.6.1 Access. If approved by the authority having jurisdiction, then 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 3-7.6.)*

3-2.2.6.2 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 at least 4 ft (1.2 m) in height.

3-2.2.6.3 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 10 ft (3 m) above the topmost landing of the stairs or to the roofline, whichever is lower, and at least 10 ft (3 m) horizontally.

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

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 10 ft (3 m) from the stairs shall not be required to be more than 1 hour with openings having a $^3/_4$-hour fire protection rating.

3-2.2.6.4 Protection of Openings. All openings below an outside stair shall be protected with an assembly having a $^3/_4$-hour fire protection rating under one of the following conditions:

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

3-2.2.6.5* Water Accumulation. Outside stairs and landings shall be designed to minimize water accumulation on their surfaces.

3-2.2.6.6 Openness. Outside stairs shall be at least 50 percent open on one side and shall be arranged to restrict the accumulation of smoke.

3-2.3 Smokeproof Enclosures.

3-2.3.1† 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 3-1, the special requirements of 3-2.3, and the building code.

3-2.3.2 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.

3-2.3.3 Vestibule. Where a vestibule is provided, the doorway into the vestibule shall be protected with an approved fire door assembly that has a $1^1/_2$-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 10 ft (3 m) of the vestibule door.

3-2.3.4 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.

3-2.4 Horizontal Exits.

3-2.4.1* 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 3-1 and the special requirements of 3-2.4. 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.

3-2.4.2 Health Care Occupancy Horizontal Exits.

3-2.4.2.1 Health care occupancy horizontal exits shall comply with the requirements of 3-2.4.1 and 3-2.4.3 through 3-2.4.5 except as modified by 3-2.4.2.

3-2.4.2.2 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 3-2.1.14. The door shall be a minimum of 41.5 in. (105 cm) in clear width.

3-2.4.2.3 A horizontal exit involving a corridor of 8 ft (2.4 m) or more 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 of at least 41.5 in. (105 cm), or a horizontal sliding door that complies with 3-2.1.14 and provides a clear width of at least 83 in. (211 cm).

3-2.4.2.4 A horizontal exit involving a corridor 6 ft (1.8 m) or more 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 of at least 32 in. (81 cm), or a horizontal sliding door that complies with 3-2.1.14 and provides a clear width of at least 64 in. (163 cm).

3-2.4.2.5 An approved vision panel shall be required in each horizontal exit. Center mullions shall be prohibited.

3-2.4.3 Fire Compartments.

3-2.4.3.1 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 Nos. 1 and 2 to 3-2.4.1.

3-2.4.3.2 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.

3-2.4.3.3 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 3-2.1.5.

3-2.4.3.4 The floor area on either side of a horizontal exit shall be sufficient to hold the occupants of both floor areas, providing at least the clear floor area per person shown in Table 3-2.4.3.4.

Table 3-2.4.3.4 Minimum Floor Area on Each Side of Horizontal Exit

	Clear Floor Area	
Occupancy/Use	**net ft²**	**net m²**
Health care — hospital, nursing home	30/patient	2.8/patient
Health care — limited care facility	15/patient	1.4/patient
Health care — stories not housing bed or litter patients	6/occupant	0.56/occupant
Detention and correctional	6/occupant	0.56/occupant
All others	3/occupant	0.28/occupant

3-2.4.4 Fire Barriers.

3-2.4.4.1 Fire barriers separating building areas between which there are horizontal exits shall have a 2-hour fire resistance rating with $1^1/_2$-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:

(a) 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 at least equal to that of the horizontal exit fire barrier.

(b) Vertical openings between the story with the horizontal exit and the open fire area story are enclosed with construction having a fire resistance rating at least equal to that of the horizontal exit fire barrier.

(c) All required exits, other than horizontal exits, discharge directly to the outside.

3-2.4.4.2† If fire barriers that serve horizontal exits terminate at outside walls and the outside walls, for a distance of 10 ft (3 m) on each side of the horizontal exit, are at an angle of not more than 180 degrees, then the outside walls shall have a 1-hour fire resistance rating with $^3/_4$-hour fire protection–rated opening protectives for a distance of 10 ft (3 m) on each side of the horizontal exit.

3-2.4.4.3† Fire barriers forming horizontal exits shall not be penetrated by ducts.

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.

3-2.4.4.4 Any opening in such fire barriers shall be protected.

3-2.4.4.5 Doors in horizontal exits shall comply with 3-2.1.4.

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

shall be permitted to be an automatic sliding fire door that shall be kept open whenever the building is occupied.

3-2.4.4.6† Swinging fire doors shall be permitted in horizontal exits, provided the following conditions are met:

(a) They swing in the direction of egress travel.

(b) 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

Exception to (b): Sleeping room areas in detention and correctional occupancies shall be exempt from the sign requirement.

(c) They are of any other approved arrangement provided that the doors always swing with any possible egress travel.

3-2.4.4.7* Doors in horizontal exits shall be designed and installed to minimize air leakage.

3-2.4.4.8*† All fire doors in horizontal exits shall be self-closing or automatic-closing in accordance with 3-2.1.8. Horizontal exit doors located across a corridor shall be automatic-closing in accordance with 3-2.1.8.

3-2.4.5 Bridges and Balconies.

3-2.4.5.1 Each bridge or balcony utilized in conjunction with horizontal exits shall have guards and handrails that comply with the requirements of 3-2.2.4.

3-2.4.5.2† Every bridge or balcony shall be at least as wide as the door leading to it and at least 44 in. (112 cm) wide.

3-2.4.5.3 If the bridge or balcony serves as a horizontal exit in one direction, then the door shall be required to swing only in the direction of egress travel.

3-2.4.5.4† If the bridge or balcony serves as a horizontal exit in both directions, then doors shall be provided in pairs, swinging in opposite directions. Only the door swinging in the direction of egress travel shall be counted in determination of egress capacity.

3-2.4.5.5 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.

3-2.4.5.6† All wall openings, in both of the connected buildings or fire areas, any part of which is within 10 ft (3 m) of any bridge or balcony as measured horizontally or below, shall be protected with fire doors or fixed fire window assemblies that have a $^3/_4$-hour fire protection rating.

3-2.5 Ramps.

3-2.5.1 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 3-1 and to the special requirements of 3-2.5.

3-2.5.2*† **Dimensional Criteria.** Ramps shall be in accordance with Table 3-2.5.2.

Table 3-2.5.2 Ramps

Element	Dimension
Minimum width clear of all obstructions, except projections not more than $3^1/_2$ in. (8.9 cm) at or below handrail height on each side	44 in. (112 cm)
Maximum slope	1 in 12
Maximum cross slope	1 in 48
Maximum rise for a single ramp run	30 in. (76 cm)

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 22 in. (55.9 cm) and a maximum height between landings of 12 ft (3.7 m).

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.

3-2.5.3 Ramp Details.

3-2.5.3.1 Construction.

3-2.5.3.1.1 All ramps that serve as required means of egress shall be of permanent fixed construction.

3-2.5.3.1.2 The ramp floor and landings shall be solid and without perforations.

3-2.5.3.2† **Landings**.

3-2.5.3.2.1 Ramps shall have landings at the top, 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 at least 60 in. (152 cm) long in the direction of travel.

3-2.5.3.2.2 Any changes in travel direction shall be made only at landings. Such landings shall have minimum 60 in. × 60 in. (152 cm × 152 cm) dimensions.

3-2.5.3.3 Slip Resistance. Ramps and landings shall have slip-resistant surfaces.

3-2.5.3.4 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 at least 4 in. (10.1 cm) in height.

3-2.5.4 Guards and Handrails. Guards that comply with 3-2.2.4 shall be provided for ramps. Handrails that comply with 3-2.2.4 shall be provided along both sides of a ramp run with a rise greater than 6 in. (15.2 cm). 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 3-14.

3-2.5.5 Enclosure and Protection of Ramps. Ramps in a required means of egress shall be enclosed or protected as a stair in accordance with 3-2.2.5. The use of Exception No. 2 to 3-2.2.6.3 shall be prohibited.

3-2.5.6 Special Provisions for Outside Ramps.

3-2.5.6.1* 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 at least 4 ft (122 cm) in height.

3-2.5.6.2 Water Accumulation. Outside ramps and landings shall be designed to minimize water accumulation on their surfaces.

3-2.6* Exit Passageways.

3-2.6.1* 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 3-1 and to the special requirements of 3-2.6.

3-2.6.2 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:

(a) Its assigned occupant load from only the covered mall/pedestrian way

(b) The largest occupant load assigned to it from a single tenant space/store

3-2.6.3 Floor. The floor shall be solid and without perforations.

3-2.7 Escalators and Moving Walks. Escalators and moving walks shall not constitute a part of the required means of egress.

3-2.8† Fire Escape Stairs. Fire escape stairs shall not constitute any of the required means of egress.

3-2.9 Fire Escape Ladders.

3-2.9.1 General. Fire escape ladders shall be permitted in the means of egress to provide any of the following:

(a) Access to unoccupied roof spaces
(b) A second means of egress from storage elevators
(c) A means of egress from towers and elevated platforms around machinery or similar spaces subject to occupancy by no more than three persons
(d) A secondary means of egress from boiler rooms or similar spaces subject to occupancy by no more than three persons

3-2.9.2 Construction and Installation.

3-2.9.2.1† Fire escape ladders shall comply with ANSI A14.3, *Safety Code for Fixed Ladders.*

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.

3-2.9.2.2 Ladders shall be installed with a pitch of more than 75 degrees.

3-2.9.3 Access. The lowest rung of any ladder shall not be more than 12 in. (30.5 cm) above the level of the surface beneath it.

3-2.10 Slide Escapes.

3-2.10.1 General.

3-2.10.1.1 Slide escapes that comply with the general requirements of Section 3-1 and the special requirements of 3-2.10 shall be permitted in the means of egress in the following occupancies:

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

3-2.10.1.2 Each slide escape shall be of an approved type.

3-2.10.2 Capacity.

3-2.10.2.1 Slide escapes, where permitted as required means of egress, shall be rated at a capacity of 60 persons.

3-2.10.2.2 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.

3-2.11* Alternating Tread Devices.

3-2.11.1 Alternating tread devices shall be permitted in the means of egress to provide any of the following:

(a) Access to unoccupied roof spaces
(b) A second means of egress from storage elevators
(c) A means of egress from towers and elevated platforms around machinery or similar spaces subject to occupancy by no more than three persons
(d) A secondary means of egress from boiler rooms or similar spaces subject to occupancy by no more than three persons

3-2.11.2 Alternating tread devices shall comply with the following:

(a) Handrails are provided on both sides of alternating tread devices in accordance with 3-2.2.4.5.
(b) The clear width between handrails is at least 17 in. (43.2 cm) and not more than 24 in. (61 cm).
(c) Headroom is at least 6 ft 8 in. (2 m).
(d) The angle of the device is between 50 and 68 degrees to horizontal.
(e) The height of the riser is not more than 9.5 in. (24.1 cm).
(f) Treads have a minimum projected tread depth of 5.8 in. (14.7 cm) measured in accordance with 3-2.2 with each tread providing a minimum 9.5 in. (24.1 cm) of depth including tread overlap.
(g) A minimum distance of 6 in. (15.2 cm) is provided between the stair handrail and any other object.
(h) The initial tread of the stair begins at the same elevation as the platform, landing, or floor surface.

(i) The alternating treads are not laterally separated by more than 2 in. (5.0 cm).

(j) The occupant load served is not more than three persons.

3-2.12 Areas of Refuge.

3-2.12.1 General. An area of refuge used as part of a required accessible means of egress in accordance with 3-5.4, or used as a part of any required means of egress, shall conform to the following:

(a) The general requirements of Section 3-1

(b) The special requirements of 3-2.12.2 and 3-2.12.3

Exception to (b): Areas of refuge consisting of stories of buildings that are protected throughout by an approved, supervised automatic sprinkler system.

(c) The detailed definition of *Area of Refuge* in Section 2-2

Exception to (c): 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 the Section 2-2 definition of Area of Refuge shall not be required in hotels and dormitories, apartment buildings, mercantile occupancies, and business occupancies.

3-2.12.2 Accessibility.

3-2.12.2.1 Required portions of an area of refuge shall be accessible from the space they serve by an accessible means of egress.

3-2.12.2.2 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.

3-2.12.2.3*† Where the exit providing egress from an area of refuge to a public way, in accordance with 3-2.12.2.2, includes stairs, the minimum clear width of landings and stair flights, measured between handrails and at all points below handrail height, shall be 48 in. (122 cm).

Exception No. 1: The minimum 48 in. (122 cm) 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 3-2.4. (See also 3-2.12.3.4.)

Exception No. 2: For stairs where egress is in the descending direction, a minimum 37 in. (94 cm) 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.

3-2.12.2.4* If an elevator provides access from an area of refuge to a public way, in accordance with 3-2.12.2.2, 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 3-2.3 for smokeproof enclosures.

Exception No. 1: The smokeproof enclosure shall not be required for areas of refuge that are more than 1000 ft^2 (93 m^2) in size and are created by a horizontal exit that meets the requirements of 3-2.4.

Exception No. 2: Elevators that comply with 3-2.13.

3-2.12.2.5 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 3-2.12.3.5.)*

3-2.12.2.6* 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.

3-2.12.3 Details.

3-2.12.3.1* Each area of refuge shall be sized to accommodate one wheelchair space of 30 in. × 48 in. (76 cm × 122 cm) 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 at least that required for the occupant load served and at least 36 in. (91 cm).

3-2.12.3.2* For any area of refuge no greater than 1000 ft^2 (93 m^2) 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.

3-2.12.3.3 Access to any designated wheelchair space in an area of refuge shall not be through more than one adjoining wheelchair space.

3-2.12.3.4*† Each area of refuge shall be separated from the remainder of the story by a barrier with at least a 1-hour fire resistance rating, 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 at least 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 3-2.1.8.2. 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.

3-2.12.3.5 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.

3-2.12.3.6 Visual signs shall be installed at all exits not providing an accessible means of egress, as defined in Section 2-2, and where necessary to indicate clearly the direction to an area of refuge.

3-2.12.3.7 Signs required by 3-2.12.3.5 and 3-2.12.3.6 shall be illuminated as required for exit signs where exit sign illumination is required.

3-2.13 Elevators.

3-2.13.1* General. An elevator that complies with the requirements of 3-2.13 shall be permitted to be used as a second means of egress from towers as defined in Section 2-2 under the following conditions:

(a) The tower and any attached structure is protected throughout by an approved, supervised automatic sprinkler system.

(b) The tower is subject to occupancy by not more than 90 persons.

(c) Primary egress discharges directly to the outside.

(d) There are no high-hazard content areas in the tower or attached structure.

(e) 100 percent of the egress capacity is provided independent of the elevators.

(f) 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.

3-2.13.2 Elevator Evacuation System Capacity.

3-2.13.2.1 The elevator car shall have a capacity of at least eight persons.

3-2.13.2.2 The elevator lobby shall have a capacity of at least 50 percent of the occupant load of the area served by the lobby. The capacity shall be calculated by using 3 ft^2 (0.28 m^2) per person and shall also include one wheelchair space of 30 in. × 48 in. (76 cm × 122 cm) for each 50 persons, or fraction thereof of the total occupant load served by that lobby.

3-2.13.3 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 at least 1 hour and shall be arranged as a smoke barrier.

3-2.13.4 Elevator Lobby Doors. Elevator lobby doors shall have a fire protection rating of at least 1 hour and shall be self-closing doors or automatic-closing doors in accordance with 3-2.1.8.

3-2.13.5 Door Activation. The elevator lobby doors shall close in response to a signal from a smoke detector located directly outside the elevator lobby 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.

3-2.13.6* Water Protection. Building elements shall be used to restrict water exposure of elevator equipment.

3-2.13.7* 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 at least 1 hour of operation in the event of a fire.

3-2.13.8* 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 at least 1 hour of operation in the event of a fire.

3-2.13.9* Elevator Operation. Elevators shall be provided with fire fighter service in accordance with ASME/ANSI A17.1, *Safety Code for Elevators and Escalators.*

3-2.13.10 Maintenance. If an elevator lobby is served by only one elevator car, then 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.

3-2.13.11 Earthquake Protection. Elevators shall have the capability 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.*

3-2.13.12 Signage. See 3-10.4.3.

3-3 Capacity of Means of Egress.

3-3.1 Occupant Load.

3-3.1.1 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 only for use 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.

3-3.1.2* 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 3-3.1.2. If both gross and net area figures are given for the same occupancy, the following calculations shall be made:

(a) 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

(b) 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.

3-3.1.3 Occupant Load Increases.

3-3.1.3.1 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 3-3.1.2, where all other requirements of this *Code* are also met, based on such increased number.

Table 3-3.1.2 Occupant Load Factors

Use	Occupant Load Factor[a]	
	ft^2/person	m^2/person
Assembly Use		
Concentrated use, without fixed seating	7 net	0.65 net
Less concentrated use, without fixed seating	15 net	1.4 net
Bench-type seating — 1 person/18 linear in. (1 person/45.7 linear cm)		
Fixed seating — number of fixed seats		
Kitchens	100	9.3
Library stack areas	100	9.3
Library reading rooms	50 net	4.6 net
Swimming pools (water surface)	50	4.6
Swimming pool decks	30	2.8
Stages	15 net	1.4 net
Lighting and access catwalks, galleries, gridirons	100 net	9.3 net
Educational Use		
Classrooms	20 net	1.9 net
Shops, laboratories, vocational rooms	50 net	4.6 net
Day-Care Use	35 net	3.3 net
Health Care Use		
Inpatient treatment departments	240	22.3
Sleeping departments	120	11.1
Detention and Correctional Use	120	11.1
Residential Use		
Hotels and dormitories	200	18.6
Apartment buildings	200	18.6
Residential board and care, large	200	18.6
Industrial Use	100	9.3
Business Use	100	9.3
Storage Use (other than mercantile storerooms)	N.A.[b]	
Mercantile Use		
Street floor	30	2.8
Two or more street floors due to grade differences	40	3.7
Sales floor below street floor	30	2.8
Upper floor used for sales	60	5.6
Floors or portions of floors used only for offices — see business use		
Floors or portions of floors used only for storage, receiving, and shipping and not open to general public	300	27.9
Covered mall buildings (per factors above[c])		

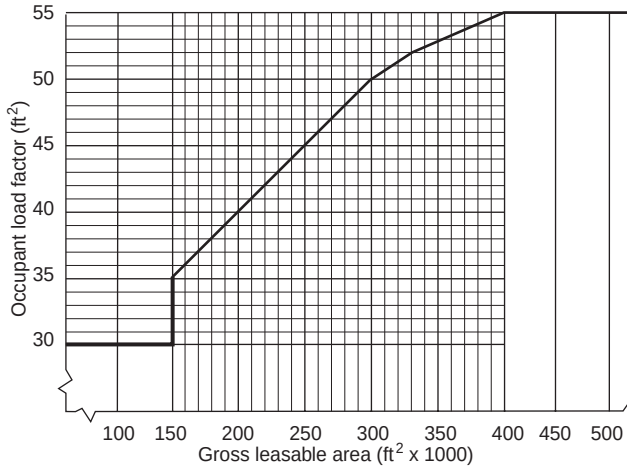
[a]All factors expressed in gross area unless marked "net."

[b]Not applicable. The occupant load of a storage occupancy shall be not less than the maximum probable number of occupants present at any time.

[c]*Exception: The portions of the covered mall, where considered a pedestrian way and not used as gross leasable area, shall not be assessed an occupant load. However, means of egress from a covered mall pedestrian way shall be provided for an occupant load determined by dividing the gross leasable area (not including anchor stores) by the appropriate lowest whole number occupant load factor from Figure 3-3.1.2.*

Each individual tenant space shall have means of egress to the outside or to the covered mall based on occupant loads figured by using the appropriate occupant load factor from Table 3-3.1.2.

Each individual anchor store shall have means of egress independent of the covered mall.



Note: For SI units, 1 ft^2 = 0.0929 m^2.

Figure 3-3.1.2 Covered mall occupant load factors.

3-3.1.3.2 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.

3-3.1.3.3 In assembly occupancy areas not larger than 10,000 ft^2 (930 m^2), the occupant load shall not exceed one person in 5 ft^2 (0.46 m^2); in areas larger than 10,000 ft^2 (930 m^2), the occupant load shall not exceed one person in 7 ft^2 (0.65 m^2).

Exception: Waiting spaces as permitted by 3-3.1.3.4.

3-3.1.3.4 In assembly occupancies where persons are admitted to the building at times when seats are not available to them, or when the permitted occupant load has been reached based on Table 3-3.1.2 and persons are allowed to wait in a lobby or similar space until seats or space is available, such use of lobby or similar space shall not encroach upon the required clear width of exits. Such waiting shall be restricted to areas other than the required means of egress. Exits shall be provided for such waiting spaces on the basis of one person for each 3 ft^2 (0.28 m^2) of waiting space area. Such exits shall be in addition to the exits specified for the main auditorium area and shall conform in construction and arrangement to the general rules for exits given in this chapter.

3-3.1.3.5 If the occupant load of an assembly occupancy is greater than 6000, then a life safety evaluation shall be performed in accordance with 3-14.9.

Exception: Where approved by the authority having jurisdiction, the number of usually seated occupants provided with a minimum of 15 ft^2 (1.4 m^2) of lawn surface in outdoor facilities shall be permitted to be excluded in determining the need for a life safety evaluation.

3-3.1.4 Where exits serve more than one story, the occupant load of each story considered individually shall be permitted to be used in computing the capacity of the exits at that story, provided that the required egress capacity of the exit is not decreased in the direction of egress travel.

3-3.1.5 Where means of egress from stories above and below converge at an intermediate story, the capacity of the means of egress from the point of convergence shall be at least the sum of the two.

3-3.1.6 Where any required egress capacity from a balcony or mezzanine passes through the room below, that required capacity shall be added to the required egress capacity of the room in which it is located.

3-3.1.7 In assembly occupancies, the occupant load of a stage area that is part of an assembly area shall be included in determining the occupant load for the assembly area.

3-3.2* Measurement of Means of Egress. Width of means of egress shall be measured in the clear at the narrowest point of the exit component under consideration within 80 in. (203 cm) maximum above the floor.

Exception: For egress components, projections not more than $3^1/_2$ in. (8.9 cm) on each side shall be permitted at and below a height of 38 in. (96 cm).

3-3.3 Egress Capacity.

3-3.3.1 Egress capacity for approved components of means of egress shall be based on the capacity factors shown in Table 3-3.3.1.

Table 3-3.3.1 Egress Capacity Factors

	Capacity Factor			
	Stairways		Level Components and Ramps	
Occupancy	in./ person	cm/ person	in./ person	cm/ person
Residential board and care	0.4	1.0	0.2	0.5
Health care, sprinklered	0.3	0.8	0.2	0.5
Health care, nonsprinklered	0.6	1.5	0.5	1.3
High-hazard contents	0.7	1.8	0.4	1.0
All others	0.3	0.8	0.2	0.5

Exception No. 1: Assembly seating means of egress capacity sized in accordance with Section 3-14.

Exception No. 2: Open structures shall be exempt from the requirements for capacity of means of egress.

3-3.3.2 The required capacity of a corridor is the occupant load utilizing the corridor for exit access divided by the required number of exits to which the corridor connects, but shall be at least the required capacity of the exit to which the corridor leads.

3-3.3.3 In apartments, hotels and dormitories, business occupancies, mercantile occupancies, and large residential board and care facilities, street floor exits shall be sufficient for the occupant load of the street floor plus the required capacity of means of egress stairs and ramps discharging through the street floor.

3-3.4 Minimum Width.

3-3.4.1 The minimum width of any means of egress shall be that required by this chapter for a given egress component and shall be at least 36 in. (91 cm).

Exception No. 1:† The minimum width of an exit access formed by furniture and movable partitions, serving not more than six people, and not more than 50 ft (15 m) in length, shall be at least 18 in. (45.7 cm) at and below a height of 38 in. (96 cm) or 28 in. (71 cm) above a height of 38 in. (96 cm) if the minimum 36 in. (91 cm) width can be provided without moving permanent walls.*

Exception No. 2: Doors as specified for in 3-2.1.2.

Exception No. 3: In assembly occupancies, aisles, and aisle accessways as specified in Section 3-14.

Exception No. 4: 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 to have a minimum 22 in. (55.9 cm) clear width.

3-3.4.2* Business Occupancy Corridor Width. In business occupancies, the minimum width of any corridor or passageway shall be 44 in. (112 cm) in the clear.

3-3.4.3 Assembly Occupancy Corridor Width. In assembly occupancies, the minimum width of any exit access corridor serving 50 or more persons shall be 44 in. (112 cm).

3-3.4.4 Hotel and Dormitory Corridor Width. In hotels and dormitories, the minimum corridor width shall be not less than 44 in. (112 cm).

Exception: Corridors within individual guest rooms or individual guest suites.

3-3.4.5 Apartment Building Corridor Width. In apartment buildings, the minimum corridor width shall be not less than 44 in. (112 cm).

Exception: Corridors with a required capacity of not more than 50 persons shall be not less than 36 in. (91 cm) in width.

3-3.4.6 Large Residential Board and Care Occupancy Corridor Width. In large residential board and care occupancies, the width of corridors shall be sufficient for the occupant load served, but shall be not less than 44 in. (112 cm).

Exception: Corridors serving an occupant load of fewer than 50 shall be not less than 36 in. (91 cm) wide.

3-3.4.7 Educational Occupancy Corridor Width. In educational occupancies, exit access corridors shall be not less than 72 in. (183 cm) clear width.

3-3.4.8 Educational Occupancy Aisle Width. In educational occupancies where there are more than 60 seats, every aisle shall be not less than 36 in. (91 cm) wide if serving seats on one side only and not less than 42 in. (107 cm) wide if serving seats on both sides. Where serving 60 seats or fewer, aisles shall be not less than 30 in. (76 cm) wide. The space between parallel rows of seats shall not constitute an aisle. No more than six seats shall intervene between any seat and an aisle.

3-3.4.9 Health Care Occupancy Corridor Width.

3-3.4.9.1 Aisles, corridors, and ramps that are required for exit access in a hospital or nursing home shall be at least 8 ft (2.4 m) in clear and unobstructed width.

Exception No. 1: Aisles, corridors, and ramps in adjunct areas not intended for the housing, treatment, or use of inpatients shall be a minimum of 44 in. (112 cm) in clear and unobstructed width.*

Exception No. 2: Exit access within a room or suite of rooms that complies with the requirements of 3-5.1.23.*

3-3.4.9.2 Aisles, corridors, and ramps that are required for exit access in a limited care facility or hospital for psychiatric care shall be at least 72 in. (183 cm) in clear and unobstructed width.

Exception No. 1: Aisles, corridors, and ramps in adjunct areas not intended for the housing, treatment, or use of inpatients shall be a minimum of 44 in. (112 cm) in clear and unobstructed width.*

Exception No. 2: Exit access within a room or suite of rooms that complies with the requirements of 3-5.1.23.*

3-3.4.10 Ambulatory Health Care Facility Corridor Width. In ambulatory health care facilities, the minimum width of any corridor or passageway that is required for exit access shall be 44 in. (112 cm) in clear width.

3-3.4.11 Detention and Correctional Occupancy Corridor Width. In detention and correctional occupancies, corridors and ramps that are required for egress shall be a minimum of 48 in. (122 cm) in width.

3-3.4.12 Mercantile Occupancy Aisle Width.

3-3.4.12.1 In mercantile occupancies, any required aisle shall be not less than 36 in. (91 cm) in clear width.

3-3.4.12.2 In Class A stores, at least one aisle of 5 ft (1.5 m) minimum width shall lead directly to an exit.

3-3.4.13 Where a single exit access leads to an exit, its capacity, in terms of width, shall be at least equal to the required capacity of the exit to which it leads. Where more than one exit access leads to an exit, each shall have a minimum width sized in accordance with 3-3.3 for the number of persons it accommodates but not less than required by 3-3.4.12.1.

3-4 Number of Means of Egress.

3-4.1 The minimum number of means of egress from any balcony, mezzanine, story, or portion thereof shall be two.

Exception No. 1: A mezzanine or balcony shall be permitted to have a single means of egress if the common path of travel limitations of 3-5.1.8 are met.

Exception No. 2: In assembly occupancies, balconies or mezzanines that have an occupant load not greater than 50 shall be permitted to be served by a single means of egress and such means of egress shall be permitted to lead to the floor below.

Exception No. 3: In assembly occupancies, balconies or mezzanines that have an occupant load greater than 50 but not greater than 100 shall have at least two remote means of egress, but both such means of egress shall be permitted to lead to the floor below.

Exception No. 4: In assembly occupancies, a second means of egress shall not be required from lighting and access catwalks, galleries, and gridirons if a means of escape to a floor or a roof is provided. Ladders, alternating tread devices, or spiral stairs shall be permitted in such means of escape.

Exception No. 5: Hotels, dormitories, or apartment buildings that are protected throughout by an approved, supervised automatic sprinkler system and have four stories or less with not more than four guest rooms or guest suites or apartments per floor shall be permitted to have a single exit under the following conditions:

(a) The stairway is completely enclosed or separated by barriers that have a fire resistance rating of at least 1 hour with self-closing 1-hour fire protection–rated doors protecting all openings between the stairway enclosure and the building.

(b) The stairway does not serve more than one-half story below the level of exit discharge.

(c) All corridors serving as access to exits have at least a 1-hour fire resistance rating.

(d) There is not more than 35 ft (10.7 m) of travel distance from the entrance door of any guest room or guest suite or apartment to an exit.

(e) One-half-hour fire rated horizontal and vertical separation between guest rooms or guest suites or apartments is provided.

Exception No. 6: In apartment buildings, any dwelling unit shall be permitted to have a single exit provided that one of the following conditions is met:

(a) The dwelling unit has an exit door opening directly to the street or yard at ground level.

(b) The dwelling unit has direct access to an outside stair complying with 3-2.2 that serves a maximum of two units, both of which are located on the same floor.

(c) The dwelling unit has direct access to an interior stair serving only that unit and separated from all other portions of the building by fire barriers having a minimum 1-hour fire resistance rating with no opening therein.

Exception No. 7: A single means of egress shall be permitted in a Class C mercantile occupancy provided that one of the following conditions is met:

(a) The travel distance does not exceed 75 ft (23 m) to the exit or to a covered mall (if it is considered a pedestrian way).

(b) The travel distance does not exceed 100 ft (30 m) to the exit or to a covered mall (if it is considered a pedestrian way), and the story on which the occupancy is located and all communicating levels that must be traversed to reach the exit or covered mall are protected throughout by an approved, automatic sprinkler system.

Exception No. 8: A single means of egress to an exit or to a covered mall (if it is considered a pedestrian way) shall be permitted from a mezzanine within any mercantile occupancy if the common path of travel does not exceed 75 ft (23 m) or 100 ft (30 m) if protected throughout by an approved, automatic sprinkler system.

Exception No. 9: In business occupancies, for a room or area with a total occupant load of fewer than 100 persons having an exit that discharges directly to the outside at the level of exit discharge for the building, with a total distance of travel, including travel within the exit, from any point not over 100 ft (30 m), a single exit shall be permitted. Such travel shall be on the same floor level or, if traversing of stairs is required, such stairs shall be not more than 15 ft (4.5 m) in height, and the stairs shall be provided with complete enclosures to separate them from any other part of the building with no door openings therein. A single outside stair, in accordance with 3-2.2, shall be permitted to serve all floors allowed within the 15-ft (4.5-m) vertical travel limitation.

Exception No. 10: Any business occupancy not over three stories and not exceeding an occupant load of 30 people per floor shall be permitted a single separate exit for each floor if the total travel distance to the outside of the building does not exceed 100 ft (30 m) and if such exit is enclosed in accordance with 3-1.1.2, serves no other levels, and discharges directly to the outside. A single outside stair in accordance with 3-2.2 shall be permitted to serve all floors.

Exception No. 11: In business occupancies, a single means of egress shall be permitted from a mezzanine if the common path of travel does not exceed 75 ft (23 m) or 100 ft (30 m) if protected throughout by an approved, automatic sprinkler system.

Exception No. 12: In business occupancies, a single exit shall be permitted for a maximum two-story single tenant space/building protected throughout by an approved, automatic sprinkler system if the total travel to the outside does not exceed 100 ft (30 m).

Exception No. 13: In storage occupancies and low- and ordinary-hazard industrial occupancies, a single means of egress shall be permitted from any story or section if the exit can be reached within 50 ft (15 m) or 100 ft (30 m) in buildings protected throughout by an approved, supervised automatic sprinkler system.

Exception No. 14: In low-hazard storage occupancies, a single means of egress shall be permitted from any story or section.

Exception No. 15: In bulk storage elevators, there shall be at least two means of egress from all working levels of the head house. One of these means of egress shall be a stair to the level of exit discharge that is enclosed by a dust-resistant 1-hour fire resistance–rated enclosure in accordance with 3-1.1.2. The second means of egress shall be either (a) or (b):

(a) An exterior stair or basket ladder-type fire escape accessible from all working levels of the head house that provides a passage to ground level

(b) An exterior stair or basket ladder-type fire escape accessible from all working levels of the head house that provides access to the top of adjoining structures and that provides a continuous path to the ground level

Exception No. 16: In underground spaces of bulk storage elevators, one means of egress and one means of escape shall be permitted in lieu of two means of egress.

Exception No. 17: In parking structures, an opening for the passage of automobiles shall be permitted to serve as an exit from a street floor, provided no door or shutter is installed therein.

Exception No. 18: In a ramp-type open-air parking structure with open vehicle ramps not subject to closure, the ramp shall be permitted to serve in lieu of the second means of egress from floors above the level of exit discharge, provided the ramp discharges directly outside at the street level.

Exception No. 19: For parking structures extending only one floor level below the level of exit discharge, a vehicle ramp leading directly to the outside shall be permitted to serve in lieu of the second means of egress, provided no door or shutter is installed therein.

Exception No. 20: In group day-care homes, every story occupied by clients shall have not fewer than two remotely located means of escape.

Exception No. 21: In group day-care homes, every room used for sleeping, living, or dining purposes shall have at least two means of escape, at least one of which shall be a door or stairway that provides a means of unobstructed travel to the outside of the building at street or ground level. The second means of escape shall be permitted to be a window in accordance with 3-5.1.15. No room or space that is accessible only by a ladder or folding stairs or through a trap door shall be occupied for living or sleeping purposes.

Exception No. 22: In group day-care homes where spaces on the story above the story of exit discharge are used by clients, at least one means of escape shall be an exit discharging directly to the outside. The second means of escape shall be permitted to be a window in accordance with 3-5.1.15.

Exception No. 23: In group day-care homes where clients occupy a story below the level of exit discharge (basement), at least one means of escape shall be an exit discharging directly to the outside, and the vertical travel to ground level shall not exceed 8 ft (2.4 m). The second means of escape shall be permitted to be a window in accordance with 3-5.1.15. No facility shall be located more than one story below the

ground. In group day-care homes, any stairway to the story above shall be cut off by a fire barrier containing a door that has at least a 20-minute fire protection rating and is equipped with a self-closing device.

Exception No. 24: The grade level of open structures is exempt from the requirements for the number of means of egress.

Exception No. 25: Open structures occupied by not more than three persons, with a travel distance of not more than 200 ft (60 m), shall be permitted to have a single exit.

Exception No. 26: Towers shall be permitted to have a single exit if the following conditions are met:

(a) The tower is subject to occupancy by fewer than 25 persons.

(b) The tower is not used for living or sleeping purposes.

(c) The tower is of noncombustible, limited-combustible, or heavy timber construction.

(d) The tower has no combustible materials in, under, or in the immediate vicinity, except necessary furniture.

(e) There are no high-hazard occupancies in the tower or in the immediate vicinity.

(f) Where the tower is located above a building, the single exit from the tower shall be provided by one of the following:

1. *An exit enclosure separated from the building with no door openings to or from the building*
2. *An exit enclosure leading directly to an exit enclosure serving the building with walls and doors separating these exit enclosures from each other, and another door allowing access to the top floor of the building, which provides access to a second exit serving that floor*

Exception No. 27: Towers with 360 degree line-of-sight requirements shall be permitted to have a single means of egress for a distance of travel not exceeding 75 ft (23 m) or 100 ft (30 m) if the tower is sprinklered throughout by an approved, supervised automatic sprinkler system.

Exception No. 28: Piers used exclusively to moor cargo vessels and to store material shall be exempt from the requirements for the number of means of egress where provided with proper means of egress from structures thereon to the pier and a single means of access to the mainland, as appropriate with the pier's arrangement.

3-4.2 The minimum number of means of egress from any story or portion thereof shall be as follows:

(a) Occupant load more than 500 but not more than 1000 — 3
(b) Occupant load more than 1000 — 4

Exception: A fenced outdoor assembly occupancy shall have at least two widely separated means of egress from the enclosure. If more than 6000 persons are to be served by such means of egress, there shall be at least three means of egress; if more than 9000 persons are to be served, there shall be at least four means of egress.

3-4.3 In mercantile occupancies and business occupancies, where a minimum of two means of egress are required, a minimum of two exits shall be as follows:

(a) Provided on every story
(b) Accessible from every part of every story and mezzanine

Exception to (b): Exit access travel shall be permitted to be common for the distances allowed as common paths of travel by 3-5.1.8.

3-4.4 In industrial occupancies, where a minimum of two means of egress are required, a minimum of one exit shall be reached without traversing another story.

3-4.5 In detention and correctional occupancies, a minimum of two separate exits shall be as follows:

(a) Provided on every story
(b) Accessible from every part of every story, fire compartment, or smoke compartment

Exception to (b): Exit access travel shall be permitted to be common for the distances allowed as common paths of travel by 3-5.1.8.

3-4.6* In detention and correctional occupancies, a minimum of one approved exit shall be accessible from each fire compartment and each required smoke compartment into which residents are potentially moved in a fire emergency with the exits arranged so that egress shall not require return through the zone of fire origin.

3-4.7 Accessible means of egress, in accordance with 3-5.4, not utilizing elevators shall be permitted to serve as any or all of the required minimum number of means of egress.

3-4.8 Only the occupant load of each story considered individually shall be required to be used in computing the number of means of egress at that story, provided that the required number of means of egress is not decreased in the direction of egress travel.

3-4.9 Doors other than the hoistway door and the elevator car door shall be prohibited at the point of access to an elevator car.

Exception: Doors that are readily openable from the car side without a key, tool, special knowledge, or special effort.

3-4.10 Elevator lobbies shall have access to at least one exit. Such exit access shall not require the use of a key, tool, special knowledge, or special effort.

3-4.11 Assembly Occupancy Exits.

3-4.11.1 Main Entrance/Exit. Every assembly occupancy shall be provided with a main entrance/exit. The main entrance/exit shall have minimum width sufficient to accommodate one-half of the total occupant load and shall be at the level of exit discharge or shall connect to a stairway or ramp leading to a street. Each level of an assembly occupancy shall have access to the main entrance/exit, and such access shall have sufficient capacity to accommodate 50 percent of the occupant load of such levels. Where the main entrance/exit from an assembly occupancy is through a lobby or foyer, the aggregate capacity of all exits from the lobby or foyer shall be permitted to provide the required capacity of the main entrance/exit regardless of whether all such exits serve as entrances to the building.

Exception No. 1: A bowling establishment shall have a main entrance/exit capacity sufficient to accommodate 50 percent of the total occupant load regardless of the number of aisles that it serves.

Exception No. 2: In assembly occupancies where there is no well-defined main entrance/exit, exits shall be permitted to be distributed around the perimeter of the building, provided the total exit width furnishes a minimum of 100 percent of the width needed to accommodate the permitted occupant load.*

3-4.11.2 Other Exits. Each level of an assembly occupancy shall have access to the main entrance/exit and shall be provided with additional exits of sufficient width to accommodate a minimum of one-half of the total occupant load served by that level. Such exits shall discharge in accordance with Section 3-7. Such exits shall be located as far apart as practicable and as far from the main entrance/exit as practicable. Such exits shall be accessible from a cross aisle or a side aisle.

Exception: In assembly occupancies where there is no well-defined main entrance/exit, exits shall be permitted to be distributed around the perimeter of the building, provided the total exit width furnishes a minimum of 100 percent of the width needed to accommodate the permitted occupant load.

3-4.12 In assembly occupancies, the upper deck of multilevel exhibits that are greater than 300 ft^2 (27.9 m^2) shall have at least two remote means of egress.

3-4.13 In health care occupancies, at least one exit from each floor or fire section shall be one of the following:

(a) A door leading directly outside the building
(b) A stair
(c) A smokeproof enclosure
(d) A ramp
(e) An exit passageway

Any fire section not meeting these requirements shall be considered part of an adjoining zone. Egress shall not require return through the zone of fire origin.

3-4.14* In health care occupancies, at least two exits shall be accessible from each smoke compartment. Egress shall be permitted through an adjacent compartment(s) but shall not require return through the compartment of fire origin.

3-5 Arrangement of Means of Egress.

3-5.1 General.

3-5.1.1 Exits shall be located and exit access shall be arranged so that exits are readily accessible at all times.

3-5.1.2* Where exits are not immediately accessible from an open floor area, continuous passageways, aisles, or corridors leading directly to every exit shall be provided and shall be arranged to provide access for each occupant to at least two exits by separate paths of travel. Exit access corridors shall provide access to at least two approved exits without passing through any intervening rooms other than corridors, lobbies, and other spaces permitted to be open to the corridor.

Exception No. 1: Where a single exit is permitted by Section 3-4.

Exception No. 2: Common paths of travel as permitted by 3-5.1.8.

Exception No. 3: Existing corridors that require passage through a room to access an exit shall be permitted to continue to be used under the following conditions:

(a) Such arrangement is approved by the authority having jurisdiction.
(b) The path of travel is marked in accordance with Section 3-10.
(c) Doors to such rooms comply with 3-2.1.
(d) Such arrangement is not prohibited by the occupancy chapter.

Exception No. 4: Corridors that are not required to be fire resistance rated shall be permitted to discharge into open floor plan areas.

3-5.1.3 Where more than one exit is required from a building or portion thereof, such exits shall be remotely located from each other and shall be arranged and constructed to minimize the possibility that more than one has the potential to be blocked by any one fire or other emergency condition.

3-5.1.4*† Where two exits or exit access doors are required, they shall be placed at a distance from one another that is equal to and at least one-half the length of the maximum overall diagonal dimension of the building or area to be served, measured in a straight line between the nearest edge of the exit doors or exit access doors. Where exit enclosures are provided as the required exits and are interconnected by a minimum 1-hour fire resistance–rated corridor, exit separation shall be permitted to be measured along the line of travel within the corridor.

Where more than two exits or exit access doors are required, at least two of the required exits or exit access doors shall be arranged to comply with the above. The other exits or exit access doors shall be located so that if one becomes blocked, the others shall be available.

Exception No. 1: In buildings protected throughout by an approved, supervised automatic sprinkler system, the minimum separation distance between two exits or exit access doors, measured in accordance with 3-5.1.4, shall be at least one-third the length of the maximum overall diagonal dimension of the building or area to be served.

Exception No. 2: In apartment buildings and hotels and dormitories, the distance between exits addressed by 3-5.1.4 shall not be applicable to common nonlooped exit access corridors in buildings that have corridor doors from the guest room or guest suite or apartments that are arranged such that the exits are located in opposite directions from such doors.

3-5.1.5* Interlocking or scissor stairs shall be permitted to be considered separate exits if enclosed in accordance with 3-1.1.2 and separated from each other by 2-hour fire resistance–rated construction. There shall be no penetrations or communicating openings, whether protected or not, between the stair enclosures.

3-5.1.6* Exit access shall be arranged so that there are no dead ends in corridors.

Exception: Dead ends as permitted by 3-5.1.8.

3-5.1.7 Exit access from rooms or spaces shall be permitted to be through adjoining or intervening rooms or areas, provided such adjoining rooms are accessory to the area served and are not hazardous areas. Foyers, lobbies, and reception rooms constructed as required for corridors shall not be construed as intervening rooms. *(See also 3-5.2.)*

3-5.1.8 Common paths of travel and dead-end corridors shall be limited to the distances shown in Table 3-5.1.8.

3-5.1.9 Underground Structures.

3-5.1.9.1 A structure or portions of a structure shall not be considered an underground structure if the story is provided on at least two sides with at least 20 ft^2 (1.9 m^2) of access opening entirely above the adjoining grade level in each 50 lineal ft (15 lineal m) of exterior enclosing wall area.

3-5.1.9.2 Exits from underground structures that have an occupant load of more than 100 persons in the underground portions of the structure and have a floor used for human occupancy that is more than 30 ft (9.1 m), or more than one level, below the lowest level of exit discharge shall be as follows:

(a) Cut off from the level of exit discharge per Section 3-1
(b) Provided with outside smoke-venting facilities or other means to prevent the exits from becoming charged with smoke from any fire in the areas served by the exits

Table 3-5.1.8 Common Path and Dead-End Corridor Limits by Occupancy

Type of Occupancy	Common Path Limit		Dead-End Corridor Limit	
	Unsprinklered ft (m)	Sprinklered ft (m)	Unsprinklered ft (m)	Sprinklered ft (m)
Assembly	20/75[a,b] (6.1/23)	20/75[a,b] (6.1/23)	20[b] (6.1)	20[b] (6.1)
Educational	75 (23)	75 (23)	20 (6.1)	20 (6.1)
Day care				
Day-care center	N.R.[c,d]	N.R.[c,d]	20 (6.1)	20 (6.1)
Health care				
Hospital, nursing home, limited care	N.R.[c]	N.R.[c]	30 (9.1)	30 (9.1)
Ambulatory care	N.R.[c]	N.R.[c]	30 (9.1)	30 (9.1)
Detention and Correctional				
Use Conditions II, III, IV	50 (15)	100 (30)	50 (15)	50 (15)
Use Condition V	50 (15)	100 (30)	20 (6.1)	20 (6.1)
Residential				
Hotels and dormitories	35[e] (10.7)	50[e] (15)	35 (10.7)	50 (15)
Apartments	35[e] (10.7)	50[e] (15)	35 (10.7)	50 (15)
Residential board and care				
Small	N.R.[c]	N.R.[c]	50 (15)	50 (15)
Large	35[f] (10)	35[f] (10)	50 (15)	50 (15)
Lodging and rooming houses	N.R.[c]	N.R.[c]	N.R.[c]	N.R.[c]
One- and two-family dwellings	N.R.[c]	N.R.[c]	N.R.[c]	N.R.[c]
Mercantile				
Stores	75 (23)	100 (30)	20 (6.1)	50 (15)
Open air	N.R.[c]	N.R.[c]	0 (0)	0 (0)
Covered mall	75 (23)	100 (30)	20 (6.1)	50 (15)
Business	75[g] (23)	100[g] (30)	20 (6.1)	50 (15)
Industrial				
General	50 (15)	100 (30)	50 (15)	50 (15)
Special purpose	50 (15)	100 (30)	50 (15)	50 (15)
High hazard	0 (0)	0 (0)	0 (0)	0 (0)
Aircraft servicing hangars, ground floor	50[h] (15)	50[h] (15)	50[h] (15)	50[h] (15)
Aircraft servicing hangars, mezzanine floor	50[h] (15)	50[h] (15)	50[h] (15)	50[h] (15)
Storage				
Low hazard	N.R.[c]	N.R.[c]	N.R.[c]	N.R.[c]
Ordinary hazard	50 (15)	100 (30)	50 (15)	100 (30)
High hazard	0 (0)	0 (0)	0 (0)	0 (0)
Parking garages, open	50 (15)	50 (15)	50 (15)	50 (15)
Parking garages, enclosed	50 (15)	50 (15)	50 (15)	50 (15)
Aircraft storage hangars, ground floor	50[h] (15)	100[h] (30)	50[h] (15)	50[h] (15)
Aircraft servicing hangars, mezzanine floor	50[h] (15)	75[h] (23)	50[h] (15)	50[h] (15)
Underground spaces in grain elevators	50[h](15)	50[h] (15)	N.R.[c,h]	N.R.[c,h]

[a]20 ft (6.1 m) for common path serving >50 persons; 75 ft (23 m) for common path serving ≤50 persons.
[b]See Section 3-14 for special considerations for assembly seating aisle accessways, aisles, and mezzanines.
[c]No requirement.
[d]See Section 3-5 for requirement for second exit access based on room capacity or area.
[e]This dimension is from the room/corridor or suite/corridor exit access door to the exit; thus it applies to corridor common path.
[f]See Section 3-5 for requirement for second exit access based on room area.
[g]For single tenant spaces with an occupant load of not more than 30 persons, 100 ft (30 m) permitted if common path occurs wholly within the single tenant space.
[h]0 ft (0 m) if high hazard except as permitted by Exception to 3-11.3.

3-5.1.9.3 Underground Assembly and Educational Occupancies.

3-5.1.9.3.1 In assembly occupancies and educational occupancies, underground buildings or portions of buildings that have a floor level more than 30 ft (9.1 m) below the level of exit discharge shall comply with the requirements of 3-5.1.9.3.2 through 3-5.1.9.3.4.

Exception No. 1: Areas within buildings used only for service to the building, such as boiler/heater rooms, cable vaults, and dead storage.

Exception No. 2: Auditoriums without intervening occupiable levels that comply with the requirements of this chapter.

3-5.1.9.3.2 Each level more than 30 ft (9.1 m) below the level of exit discharge shall be divided into not less than two smoke compartments by a smoke barrier having a 1-hour fire resistance rating.

3-5.1.9.3.2.1 Each smoke compartment shall have access to at least one exit without passing through the other required compartment. Any doors connecting required compartments shall be tight-fitting, minimum 1-hour rated fire doors designed and installed to minimize smoke leakage and to close and latch automatically upon detection of smoke.

3-5.1.9.3.2.2 Each smoke compartment shall be provided with a mechanical means of moving people vertically, such as an elevator or escalator.

3-5.1.9.3.2.3 Each smoke compartment shall have an independent air supply and exhaust system capable of smoke control or smoke exhaust functions that provides a minimum smoke exhaust rate of six air changes per hour.

3-5.1.9.3.2.4 Each smoke compartment shall be provided throughout with an automatic smoke detection system. The system shall be designed such that the activation of any two detectors shall cause the smoke control system to operate and the building voice alarm to sound.

3-5.1.9.3.3 Any required smoke control or exhaust system shall be provided with a standby power system that complies with Article 701 of NFPA 70, *National Electrical Code®*.

3-5.1.9.3.4 The building shall be provided with an approved, supervised voice alarm system. A prerecorded evacuation message shall be provided.

3-5.1.10 Industrial Occupancy Ancillary Facilities.

3-5.1.10.1* Means of egress from industrial occupancy ancillary facilities shall be arranged to permit travel in independent directions such that both means of egress paths are not compromised by the same fire or similar emergency.

3-5.1.10.2* Ancillary facilities in special-purpose industrial occupancies where delayed evacuation is anticipated shall have minimum 2-hour fire resistance–rated separation from the predominant industrial occupancy and shall have one means of egress that is separated from the predominant industrial occupancy by 2-hour fire resistance–rated construction.

3-5.1.11 Parking Structures with Fuel Dispensing. If fuel dispensing devices are located within a parking structure, travel away from the fuel dispensing device in any direction shall lead to an exit with no dead end in which occupants might be trapped by fire. Within closed parking structures, exits shall be arranged and located to meet the following additional requirements:

(a) Exits shall lead to the outside of the building on the same level or to stairs; no upward travel shall be permitted unless direct outside exits are available from that floor.
(b) Any story below that story at which fuel is being dispensed shall have exits leading directly to the outside via outside stairs or doors at ground level.

3-5.1.12* Closet Doors. In day-care occupancies and dwellings, every closet door latch shall be such that clients can open the door from inside the closet.

3-5.1.13 Bathroom Doors. In day-care occupancies and dwellings, every bathroom door lock shall be designed to permit opening of the locked door from the outside in an emergency.

3-5.1.14 In day-care occupancies, every room or space with an occupant load of more than 50 persons or an area of more than 1000 ft^2 (93 m^2) shall have at least two exit access doorways as remotely located from each other as practicable. Such doorways shall provide access to separate exits, but where egress is through corridors, the doorways shall be permitted to open onto a common corridor leading to separate exits located in opposite directions.

3-5.1.15 Educational and Day-Care Occupancies Windows for Rescue and Ventilation. In day-care occupancies, every room or space normally subject to client occupancy, other than bathrooms, shall have at least one outside window for emergency rescue and ventilation. Such window shall be openable from the inside without the use of tools and shall provide a clear opening of not less than 20 in. (51 cm) in width, 24 in. (61 cm) in height, and 5.7 ft^2 (0.53 m^2) in area. The bottom of the opening shall be not more than 44 in. (112 cm) above the floor. The clear opening shall permit a rectangular solid, with a minimum width and height that provides the required 5.7-ft^2 (0.53-m^2) opening and a minimum depth of 20 in. (51 cm), to pass fully through the opening.

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

Exception No. 2: Where the room or space has a door leading directly to the outside of the building.

Exception No. 3: In educational occupancies, in rooms located higher than three stories above grade, the openable clear height, width, and area of the window shall be permitted to be modified to the dimensions necessary for ventilation.

3-5.1.16 Day-Care Occupancies in Apartment Buildings. If the two exit accesses from a day-care occupancy or group day-care occupancy enter the same corridor as the apartment occupancy, the exit accesses shall be separated in the corridor by a smoke barrier having not less than a 1-hour fire resistance rating. The smoke barrier shall be located so that it has an exit on each side.

3-5.1.17 Educational and Day-Care Occupancies Flexible Plan and Open Plan Buildings. In educational and day-care occupancies, each room occupied by more than 300 persons shall have two or more means of egress entering into separate atmospheres. If three or more means of egress are required, not more than two of them shall enter into a common atmosphere.

3-5.1.18 Arena Floor Egress. Where the floor area of auditoriums and arenas is used for activities and events, at least 50 percent of the occupant load of the floor area shall have means of egress provided without passing through adjacent fixed seating areas.

3-5.1.19 Educational Occupancy Floor Location. In educational occupancies, rooms normally occupied by preschool, kindergarten, or first-grade pupils shall not be located above or below the level of exit discharge. Rooms normally occupied by second-grade pupils shall not be located more than one story above the level of exit discharge.

3-5.1.20 Educational Occupancy Corridor Obstructions. In educational occupancies, drinking fountains or other equipment, fixed or movable, shall not be placed so as to obstruct the required minimum 6-ft (1.8-m) corridor width.

3-5.1.21 Educational Occupancy Corridor Access. In educational occupancies, every room that is normally occupied shall have an exit access door that leads directly to an exit access corridor or exit.

Exception No. 1: If there is an exit door opening directly to the outside or to an exterior balcony or corridor.

Exception No. 2: One room shall be permitted to intervene between a normally occupied student room and an exit access corridor provided the following:

(a) The total travel from a room served by an intervening room to the corridor door or exit shall not exceed 75 ft (23 m); and

(b) Clothing, personal effects, or other materials deemed hazardous by the authority having jurisdiction shall be stored in metal lockers provided they do not obstruct the exit access, or the intervening room shall be sprinklered; and either

(c) The intervening room shall have installed approved fire detection that will activate the building alarm, or

(d) The building shall be protected by an approved, automatic sprinkler system.

3-5.1.22 Educational Occupancy Exit Accesses. In educational occupancies, every room or space with a capacity of more than 50 persons or an area of more than 1000 ft^2 (93 m^2) shall have at least two exit access doorways as remotely located from each other as practicable. Such doorways shall provide access to separate exits but, where egress is through corridors, they shall be permitted to open onto a common corridor leading to separate exits located in opposite directions.

3-5.1.23 Special Provisions for Health Care Occupancy Arrangement of Means of Egress.

3-5.1.23.1 Every habitable room shall have an exit access door that leads directly to an exit access corridor.

Exception No. 1: If there is an exit door opening directly to the outside from the room at the ground level.

Exception No. 2: Patient sleeping rooms shall be permitted to have one intervening room if the intervening room is not used as an exit access for more than eight patient sleeping beds.

Exception No. 3: Special nursing suites shall be permitted to have one intervening room provided that the arrangement allows for direct and constant visual supervision by nursing personnel.

Exception No. 4: For rooms other than patient sleeping rooms, one or more adjacent rooms shall be permitted to intervene in accordance with 3-5.1.23.8.

3-5.1.23.2 Any patient sleeping room, or any suite that includes patient sleeping rooms, of more than 1000 ft^2 (93 m^2) shall have at least two exit access doors remotely located from each other.

3-5.1.23.3 Any room or any suite of rooms, other than patient sleeping rooms, of more than 2500 ft^2 (230 m^2) shall have at least two exit access doors remotely located from each other.

3-5.1.23.4 Any suite of rooms that complies with the requirements of 3-5.1.23 shall be permitted to be subdivided with non-fire-rated, noncombustible or limited-combustible partitions.

3-5.1.23.5 Intervening rooms shall not be hazardous areas.

3-5.1.23.6 Suites of sleeping rooms shall not exceed 5000 ft^2 (460 m^2).

3-5.1.23.7 Suites of rooms, other than patient sleeping rooms, shall not exceed 10,000 ft^2 (930 m^2).

3-5.1.23.8 Suites of rooms, other than patient sleeping rooms, shall be permitted to have one intervening room if the travel distance within the suite to the exit access door is not greater than 100 ft (30 m) and shall be permitted to have two intervening rooms if the travel distance within the suite to the exit access door is not greater than 50 ft (15 m).

3-5.1.23.9 Every corridor shall provide access to at least two approved exits without occupants having to pass through any intervening rooms or spaces other than corridors or lobbies.

3-5.1.23.10 Windowless buildings or windowless portions of buildings shall not be used for patient sleeping rooms.

3-5.1.24 In ambulatory health care facilities, any room and any suite of rooms of more than 2500 ft^2 (232 m^2) shall have at least two exit access doors remotely located from each other.

3-5.1.25 In ambulatory health care facilities, at least two exits shall be accessible from each smoke compartment. Egress shall be permitted through adjacent compartments but shall not require return through the compartment of fire origin.

3-5.1.26 In detention and correctional occupancies, every sleeping room shall have a door that leads directly to an exit access corridor.

Exception No. 1: If there is an exit door opening directly to the outside from the room at the ground level.

Exception No. 2: One adjacent room, such as a day room, group activity space, or other common space, shall be permitted to intervene. Where sleeping rooms directly adjoin a day room or group activity space that is utilized for access to an exit, such sleeping rooms shall be permitted to open directly to the day room or space and shall be permitted to be separated in elevation by a one-half or full story height.

3-5.1.27 In detention and correctional occupancies, a sally port shall be permitted in a means of egress provided that there are provisions for continuous and unobstructed travel through the sally port during an emergency egress condition.

3-5.1.28 Subdivision of Detention and Correctional Occupancy Resident Housing Spaces. Subdivision of facility spaces shall comply with Table 3-5.1.28.

3-5.1.29 In hotels and dormitories, any guest room or any guest suite of rooms in excess of 2000 ft^2 (185 m^2) shall be provided with at least two exit access doors remotely located from each other.

Table 3-5.1.28 Subdivision of Resident Housing Spaces

	Use Condition									
	II		III				IV		V	
Feature	NS	AS	NS		AS		NS	AS	NS	AS
Room to room separation	NR	NR	NR		NR		SR	NR	FR($^1/_2$)	SR
Room face to corridor separation	SR	NR	SR		NR		SR	NR	FR	SR
Room face to common space separation	NR	NR	NR ≤50 ft* (15 m)	SR >50 ft* (15 m)	NR ≤50 ft* (15 m)	SR >50 ft* (15 m)	SR	NR ≤50 ft* (15 m)	SR >50 ft* (15 m)	FR	SR
Common space to corridor separation	FR	NR	FR		NR		FR	NR	FR	SR
Total openings in solid room face when room face is required to be smoketight or fire rated	120 in.^{2} (0.08 m^2)		120 in.^{2} (0.08 m^2)				120 in.^{2} (0.08 m^2)		120 in.^{2} (0.08 m^2) Closable from inside or 120 in.^{2} (0.08 m^2) with smoke control	

AS: Protected by automatic sprinklers
NS: Not protected by automatic sprinklers
NR: No requirement
SR: Smoke resistant
FR: Fire rated—1 hour
FR($^1/_2$): Fire rated — $^1/_2$ hour

Notes:

1. Doors in openings in partitions required to be fire resistive in accordance with this chart in other than required enclosures of exits or hazardous areas shall be substantial doors and of construction that resists fire for a minimum of 20 minutes. Wired glass or minimum 45-minute fire-rated glazing vision panels shall be permitted. Latches and door closers shall not be required on cell doors.
2. Doors in openings in partitions required to be smoke resistant in accordance with this chart shall be substantial doors and of construction that resists the passage of smoke. Latches and door closers shall not be required on cell doors.
3. "Total openings in solid room face" includes all openings (e.g., undercuts, food passes, grilles, and so on), the total of which shall not exceed 120 in.^{2} (0.08 m^2). All openings shall be 36 in. (91 cm) or less above the floor.
4. Under Use Condition II, III, or IV, a space subdivided by open construction (i.e., any combination of grating doors and grating walls or solid walls) shall be permitted to be considered one room if housing not more than 16 persons. The perimeter walls of such space shall be of smoke-resistant construction. Smoke detection shall be provided in such space. Under Use Condition IV, common walls between sleeping areas within the space shall be smoke resistant, and grating doors and fronts shall be permitted to be used. Under Use Conditions II and III, open dormitories shall be permitted to house more than 16 persons as permitted by other sections of this chapter.

*The travel distance through the common space to the exit access corridor.

3-5.1.30 In large board and care facilities, any room or any suite of rooms in excess of 2000 ft^2 (185 m^2) shall be provided with at least two exit access doors remotely located from each other.

3-5.1.31 Special Provisions for Mercantile Occupancy Arrangement of Means of Egress.

3-5.1.31.1 Open Stairs and Ramps. No inside open stairway or inside open ramp shall be permitted to serve as a component of the required means of egress system for more than one floor.

3-5.1.31.2 Floors Below Street Floor. If there are two or more floors below the street floor, then the same stair or other exit shall be permitted to serve all floors, but all required exits from such areas shall be independent of any open stairways between the street floor and the floor below it.

3-5.1.31.3 Outside Exits. If a level, outside exit from upper floors is possible owing to hills, then such outside exits shall be permitted to serve instead of horizontal exits. If, however, such outside exits from the upper floor also serve as an entrance from a principal street, then the upper floor shall be

classified as a street floor in accordance with the definition in Section 2-2 and shall be subject to the requirements of this chapter for street floors.

3-5.1.31.4 Doors at Stairs. All doors at the foot of stairs from upper floors or at the head of stairs leading to floors below the street floor shall swing in the direction of egress travel.

3-5.1.31.5 Aisles Leading to Exits. Aisles leading to each exit shall be required. The aggregate width of such aisles shall be equal to at least the required width of the exit.

3-5.1.31.6 Exterior Wall Entrance. If the only means of customer entrance is through one exterior wall of the building, two-thirds of the required egress width shall be located in this wall.

Exception: Bulk merchandising retail buildings.

3-5.1.31.7 Egress Through Checkout Stands. At least one-half of the required exits shall be located so as to be reached without passing through checkout stands. In no case shall checkout stands or associated railings or barriers obstruct exits, required aisles, or approaches thereto.

3-5.1.31.8* Use of Carts. If wheeled carts or buggies are used by customers, then adequate provision shall be made for the transit and parking of such carts to minimize the possibility that they might obstruct means of egress.

3-5.1.31.9 Exit Access Through Storerooms. Exit access in Class A and Class B stores that are protected throughout by an approved, automatic sprinkler system and exit access in all Class C stores shall be permitted to pass through storerooms, provided that the following conditions are met:

(a) Not more than 50 percent of exit access shall be provided through the storeroom.
(b) The storeroom shall not be subject to locking.
(c) The main aisle through the storeroom shall be not less than 44 in. (112 cm) wide.
(d) The path of travel, defined with fixed barriers, through the storeroom shall be direct and continuously maintained in an unobstructed condition.

3-5.1.32 Special Provisions for Covered Mall Buildings.

3-5.1.32.1 The covered mall building shall be treated as a single building for the purpose of calculation of means of egress and shall be subject to the requirements for appropriate occupancies. The covered mall shall be at least of sufficient clear width to accommodate egress requirements as set forth in other sections of this *Code*.

Exception: The covered mall shall be permitted to be considered a pedestrian way, in which case the distance of travel within a tenant space to an exit or to the covered mall shall be a maximum of 200 ft (60 m) [see 3-6.1] or shall be the maximum for the appropriate occupancy; plus, an additional 200 ft (60 m) shall be permitted for travel through the covered mall space if all of the following requirements are met:

(a) The covered mall shall be at least of sufficient clear width to accommodate egress requirements as set forth in other sections of this chapter, but in no case shall be less than 20 ft (6.1 m) wide in its narrowest dimension.

(b) On each side of the mall floor area, the covered mall shall be provided with an unobstructed exit access of not less than 10 ft (3 m) in clear width parallel to and adjacent to the mall tenant front. Such exit access shall lead to an exit having a minimum width of 66 in. (168 cm).*

(c) The covered mall and all buildings connected thereto shall be protected throughout by an approved, supervised automatic sprinkler system. The system shall be installed in such a manner that any portion of the system that serves tenant spaces can be taken out of service without affecting the operation of the portion of the system that serves the covered mall.

(d) Walls that divide stores from each other shall extend from the floor to the underside of the roof deck, floor deck above, or ceiling where the ceiling is constructed to limit the transfer of smoke. If the tenant areas are provided with an engineered smoke control system, then walls shall not be required to divide stores from each other. No separation shall be required between a tenant space and the covered mall.

(e) The covered mall shall be provided with a smoke control system.*

3-5.1.32.2 Covered Mall Egress Details.

3-5.1.32.2.1 Every floor of a covered mall shall be provided with a number of means of egress as specified by Section 3-4 with no less than two means of egress remotely located from each other.

3-5.1.32.2.2 Class A and Class B stores connected to a covered mall shall be provided with the number of means of egress required by Section 3-4 with no less than two means of egress remotely located from each other.

3-5.1.32.2.3* Each individual anchor store shall have means of egress independent of the covered mall.

3-5.1.32.2.4 Every covered mall shall be provided with unobstructed exit access parallel to and adjacent to the mall tenant fronts. This exit access shall extend to each mall exit.

3-5.1.33 Special Provisions for Bulk Merchandising Retail Buildings.

3-5.1.33.1 New bulk merchandising retail buildings that exceed 12,000 ft^2 (1100 m^2) in area shall comply with the requirements of this chapter as modified by 3-5.1.33.2.

3-5.1.33.2 Not less than 50 percent of the required egress capacity shall be located independent of the main entrance/exit doors.

3-5.1.34 Long Piers. Piers not meeting the conditions of Exception No. 28 to 3-4.1 and occupied for other than cargo handling and storage shall have means of egress arranged in accordance with this chapter. In addition, one of the following measures shall be provided on piers that extend over 150 ft (45 m) from shore to minimize the possibility that fire under or on the pier might block escape of occupants to the shore:

(a) The pier shall be arranged to provide two separate paths to travel to shore, such as by two well-separated walkways or independent structures.
(b) The pier deck shall be open and fire resistive, and set on noncombustible supports.
(c) The pier shall be open and unobstructed and shall be 50 ft (15 m) or more in width if less than 500 ft (150 m) long, or its width shall be not less than 10 percent of its length if over 500 ft (150 m) long.
(d) The pier deck shall be provided with automatic sprinkler protection for combustible substructure and all superstructures.

3-5.2 Impediments to Egress. See 3-1.5.

3-5.2.1 In no case shall access to an exit be through kitchens, storerooms, restrooms, workrooms, closets, bedrooms or similar spaces, or other rooms subject to locking.

Exception No. 1: Exit access shall be permitted to pass through rooms or spaces in health care occupancies and detention and correctional occupancies subject to locking as permitted by 3-2.1.

Exception No. 2: Exit access shall be permitted to pass through storerooms in mercantile occupancies in accordance with 3-5.1.31.9.

3-5.2.2* Exit access and exit doors shall be designed and arranged to be clearly recognizable. Hangings or draperies shall not be placed over exit doors or be located such that they conceal or obscure any exit. Mirrors shall not be placed on exit doors. Mirrors shall not be placed in or adjacent to any exit in such a manner as to confuse the direction of exit.

Exception: Curtains shall be permitted across means of egress openings in tent walls under the following conditions:

(a) Curtains are distinctly marked in contrast to the tent wall so as to be recognizable as means of egress.

(b) Curtains are installed across an opening that is at least 6 ft (1.8 m) in width.

(c) Curtains are hung from slide rings or equivalent hardware so as to be readily moved to the side to create an unobstructed opening in the tent wall of the minimum width required of door openings.

3-5.3 Exterior Paths of Exit Access.

3-5.3.1 Exit access shall be permitted to be by means of any exterior balcony, porch, gallery, or roof that conforms to the requirements of this chapter.

3-5.3.2 The long side of the balcony, porch, gallery, or similar space shall be at least 50 percent open and shall be arranged to restrict the accumulation of smoke.

3-5.3.3 Exterior exit access balconies shall be separated from the interior of the building by walls and opening protectives as required for corridors.

Exception No. 1: Where the exterior exit access balcony is served by at least two remote stairs that are accessed without any occupant needing to travel past an unprotected opening to reach one of the stairs.

Exception No. 2: Where dead ends on the exterior exit access do not exceed 20 ft (6.1 m).

3-5.3.4 Exit access balconies shall not have dead ends in excess of those permitted for dead-end corridors by 3-5.1.8.

3-5.3.5 Educational Occupancy Exterior Exit Access.

3-5.3.5.1* In educational occupancies where exterior corridors or balconies are provided as means of egress, they shall open to the outside air except for railings or balustrades, with stairs or exits level to grade not over the allowable travel distance apart and located so that an exit will be available in either direction from the door to any individual room or space, with dead ends not to exceed 20 ft (6.1 m). If balconies are enclosed by glass or in any other manner, they shall be treated as interior corridors.

3-5.3.5.2 In educational occupancies, the floors of balconies (exterior corridors) and stairs shall be solid, without openings, and shall comply with requirements for outside stairs with respect to balustrades or railings, width and pitch of stairs, and other details. However, they shall not be required to be shielded from fire within the building by blank walls, wired glass windows, or the like where the stairs are located on the side of the balcony or corridor away from the building and are separated from the building by the full required width of the balcony or corridor.

3-5.4 Accessible Means of Egress.

3-5.4.1* Areas accessible to people with severe mobility impairment shall have at least two accessible means of egress. *(See definition of accessible means of egress in Section 2-2.)* Access shall be provided to a minimum of one area of refuge or one accessible exit that provides an accessible route to an exit discharge, within the allowable travel distance.

Exception No. 1: Exit access travel along the accessible means of egress shall be permitted to be common for the distances permitted as common paths of travel.

Exception No. 2: A single accessible means of egress shall be permitted from buildings or areas of buildings that are permitted to have a single exit.

Exception No. 3: Health care occupancies that are protected throughout by an approved, supervised automatic sprinkler system.

3-5.4.2 If two accessible means of egress are required, the exits serving these paths shall be placed at a distance from each other not less than one-half the length of the maximum overall diagonal dimension of the building or area to be served, measured in a straight line between the nearest edge of the exit doors or exit access doors. If exit enclosures are provided as the required exits and are interconnected by a minimum 1-hour fire resistance–rated corridor conforming to the requirements of 3-1.1.1, then exit separation shall be permitted to be measured along the line of travel within the corridor.

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

Exception No. 2: Where the physical arrangement of means of egress prevents the possibility that access to both accessible means of egress will be blocked by any one fire or other emergency condition as approved by the authority having jurisdiction.

3-5.4.3 Each required accessible means of egress shall be continuous from each accessible occupied area to a public way or area of refuge in accordance with 3-2.12.2.2.

3-5.4.4 If an exit stair is used in an accessible means of egress, then it shall comply with 3-2.12.2.3 and either shall incorporate an area of refuge within an enlarged story-level landing or shall be accessed from an area of refuge.

3-5.4.5 To be considered part of an accessible means of egress, an elevator shall be in accordance with 3-2.12.2.4.

3-5.4.6 A smoke barrier that additionally has a minimum 1-hour fire resistance rating, and a horizontal exit in accordance with 3-2.4, to be considered part of an accessible means of egress, shall discharge to an area of refuge in accordance with 3-2.12.

3-5.4.7 Accessible stories that are four or more stories above or below a story of exit discharge shall have at least one elevator that complies with 3-2.12.2.4.

3-6 Measurement of Travel Distance to Exits.

3-6.1* The travel distance in any occupied space to at least one exit, measured in accordance with the following requirements, shall not be more than the limits specified in Table 3-6.1.

Exception No. 1: Open structures shall be exempt from travel distance limitations.

Exception No. 2: Towers occupied by not more than three persons shall be exempt from travel distance limitations.

Table 3-6.1 Travel Distance Limits by Occupancy

Type of Occupancy	Travel Distance Limit	
	Unsprinklered ft (m)	Sprinklered ft (m)
Assembly	150[a] (45)	200[a] (60)
Within the exhibit booth or exhibit enclosure to an exit access aisle	50 (15)	50 (15)
Educational	150 (45)	200 (60)
Day care		
Day-care center		
From room door to exit	100 (30)	150 (45)
Total travel distance	150 (45)	200 (60)
Within sleeping room to exit access door	50 (15)	50 (15)
Health care		
Hospital, nursing home, and limited care		
Within room to exit access door	50 (15)	50 (15)
From room door to exit	100 (30)	150 (45)
Total travel distance	150 (45)	200 (60)
Ambulatory health care		
From room door to exit	100 (30)	150 (45)
Total travel distance	150 (45)	200 (60)
Detention and correctional		
Within sleeping room to exit access door	50 (15)	100 (30)
Within open dormitory, with smoketight construction and minimum two exit access doors, to exit access door	100 (30)	100 (30)
From room door to exit	100 (30)	150 (45)
Total travel distance	150 (45)	200 (60)
Residential		
Hotels and dormitories		
Within guest room or guest suite to corridor door	75 (23)	125 (38)
From corridor door to exit	100 (30)	200 (60)
From corridor door to exit via exterior exit access	200 (60)	200 (60)
Total travel distance if exterior exit access (addressed in above line) is used	275 (84)	325 (99)
Total travel distance without exterior exit access	175 (53)	325 (99)
Apartments		
Within living unit to corridor door	75 (23)	125 (38)
From corridor door to exit	100 (30)	200 (60)
From corridor door to exit via exterior exit access	200 (60)	200 (60)
From areas other than living units to exit	200 (60)	250 (76)
Total travel distance if exterior exit access (addressed in above line) is used	275 (84)	325 (99)
Total travel distance without exterior exit access	175 (53)	325 (99)
Board and care		
Small	N.R.[b]	N.R.[b]
Large		
Within room, suite, or living unit to corridor door	75 (23)	125 (38)
From corridor door to exit	100 (30)	200 (60)
From corridor door to exit via exterior exit access	200 (60)	200 (60)
Total travel distance if exterior exit access (addressed in above line) is used	275 (84)	325 (99)
Total travel distance without exterior exit access	175 (53)	325 (99)
Lodging and rooming houses	N.R.[b]	N.R.[b]
One- and two-family dwellings	N.R.[b]	N.R.[b]
Mercantile		
Stores	100 (30)	200 (60)
Open air	N.R.[b]	N.R.[b]
Covered mall	100 (30)	400[c] (120)

Table 3-6.1 Travel Distance Limits by Occupancy *(cont'd)*

Type of Occupancy	Travel Distance Limit	
	Unsprinklered ft (m)	Sprinklered ft (m)
Business	200 (60)	300 (91)
Industrial		
General	200 (60)	250[d] (75)
Special purpose, not high hazard	300 (91)	400 (122)
High hazard	75 (23)	75 (23)
Aircraft servicing hangars, ground floor	Note e	Note e
Aircraft servicing hangars, mezzanine floor	75 (23)	75 (23)
Storage		
Low hazard	N.R.[b]	N.R.[b]
Ordinary hazard	200 (60)	400 (122)
High hazard	75 (23)	100 (30)
Parking garages, open	200 (60)	300 (91)
Parking garages, enclosed	150 (45)	200 (60)
Aircraft storage hangars, ground floor	Note e	Note e
Aircraft servicing hangars, mezzanine floor	75 (23)	75 (23)
Underground spaces in grain elevators	200 (60)	400 (122)

[a]See 3-14.10 for special considerations for smoke-protected assembly seating in arenas and stadia.
[b]No requirement.
[c]See 3-5.1.32 for special travel distance considerations in covered malls that are considered pedestrian ways.
[d]400 ft (122 m) if single-story low or ordinary hazard with smoke and heat venting.
[e]Provide exits along exterior wall at ≤150-ft (45-m) intervals and in horizontal exits at ≤100-ft (30-m) intervals.

3-6.2* The travel distance to an exit shall be measured on the floor or other walking surface along the centerline of the natural path of travel starting from the most remote point subject to occupancy, curving around any corners or obstructions with a 1-ft (0.3-m) clearance therefrom, and ending at the center of the doorway or other point at which the exit begins. If measurement includes stairs, the measurement shall be taken in the plane of the tread nosing.

3-6.3* If open stairways or ramps are permitted as a path of travel to required exits, then the distance shall include the travel on the stairway or ramp and the travel from the end of the stairway or ramp to an outside door or other exit in addition to the distance traveled to reach the stairway or ramp.

3-6.4 Travel distance limitations shall be as specified in Table 3-6.1 and for high-hazard areas in accordance with Section 3-11.

3-6.5 If any part of an exterior exit is within 10 ft (3 m) horizontal distance of any unprotected building opening, as permitted in the Exceptions to 3-2.2.6.3 for outside stairs, then the travel distance to the exit shall include the length of travel to ground level.

3-7 Discharge from Exits.

3-7.1* All exits shall terminate at a public way or at an exterior exit discharge. Yards, courts, open spaces, or other portions of the exit discharge shall be of required width and size to provide all occupants with access to a public way.

Exception No. 1: Interior exit discharge as permitted in 3-7.2.

Exception No. 2: Rooftop exit discharge as permitted in 3-7.6.

Exception No. 3: In detention and correctional occupancies, exits shall be permitted to discharge into a fenced or walled courtyard, provided that not more than two walls of the courtyard are the building walls from which egress is being made. Enclosed yards or courts shall be of sufficient size to accommodate all occupants at a minimum distance of 50 ft (15 m) from the building with a net area of 15 ft^2 (1.4 m^2) per person.

3-7.2 Not more than 50 percent of the required number of exits, and not more than 50 percent of the required egress capacity, shall be permitted to discharge through areas on the level of exit discharge, provided that the conditions of (a), (b), and (c) are met.

Exception No. 1: In detention and correctional occupancies, all exits shall be permitted to discharge through the level of exit discharge. The requirements of 3-7.2 shall be waived if not more than 50 percent of the exits discharge into a single fire compartment separated from other compartments by construction having a minimum 1-hour fire resistance rating.

Exception No. 2: Open structures that are permitted to have a single exit per Exception No. 25 to 3-4.1 shall be permitted to have 100 percent of the exit discharge through areas on the level of exit discharge.

Exception No. 3: Towers that are permitted to have a single exit per Exception Nos. 26 or 27 of 3-4.1 shall be permitted to have 100 percent of the exit discharge through areas on the level of exit discharge.

(a) Such discharge leads to a free and unobstructed path to the exterior of the building, and such path is readily visible and identifiable from the point of discharge from the exit.

(b) The level of discharge is protected throughout by an approved, automatic sprinkler system, or the portion of the level of discharge used for this purpose is protected by an approved, automatic sprinkler system and is separated from the nonsprinklered portion of the floor by a fire resistance rating that meets the requirements for the enclosure of exits *(see 3-1.1.2.1)*.

Exception to (b): If the discharge area is a vestibule or foyer that meets all of the following criteria:

1. *The depth from the exterior of the building shall not be more than 10 ft (3 m) and the length shall not be more than 30 ft (9.1 m).*
2. *The foyer shall be separated from the remainder of the level of discharge by construction that provides protection at least the equivalent of wired glass in steel frames.*
3. *The foyer serves only as means of egress and includes an exit directly to the outside.*

(c) The entire area on the level of discharge shall be separated from areas below by construction that has a fire

resistance rating at least as great as that required for the exit enclosure.

Exception to (c): Levels below the level of discharge shall be permitted to be open to the level of discharge in an atrium.

3-7.3 The exit discharge shall be arranged and marked to make clear the direction of egress to a public way. Stairs shall be arranged so as to make clear the direction of egress to a public way. Stairs that continue more than one-half story beyond the level of exit discharge shall be interrupted at the level of exit discharge by partitions, doors, or other effective means.

3-7.4 Doors, stairs, ramps, corridors, exit passageways, bridges, balconies, escalators, moving walks, and other components of an exit discharge shall comply with the detailed requirements of this chapter for such components.

3-7.5 Signs. See 3-2.2.5.4 and 3-2.2.5.5.

3-7.6 Where approved by the authority having jurisdiction, exits shall be permitted to discharge to roofs of other sections of the building or an adjoining building where the roof construction has a fire resistance rating at least the equivalent of that required for the exit enclosure, and there is a continuous means of egress from the roof.

3-7.7 In assembly occupancies where the principal entrance to an assembly occupancy is via a terrace, either raised or depressed, such terrace shall be permitted to be considered to be the level of exit discharge under the following conditions:

(a) The terrace is at least as long (measured parallel to the building) as the total width of the exit(s) it serves but not less than 5 ft (1.5 m) long.
(b) The terrace is at least as wide (measured perpendicularly to the building) as the exit(s) it serves but not less than 10 ft (3 m) wide.
(c) Required stairs leading from the terrace to grade are protected in accordance with 3-2.2.6.4 or are a minimum of 10 ft (3 m) from the building.

3-7.8 In educational occupancies, every classroom or room used for educational purposes or student occupancy below the floor of exit discharge shall have access to at least one exit that leads directly to the exterior at level of discharge without entering the floor above.

3-7.9 In hotels and dormitories, the distance of travel from the termination of the exit enclosure to an exterior door that leads to a public way shall not exceed 100 ft (30 m).

3-7.10* In mercantile occupancies, fifty percent of the exits shall be permitted to discharge through the level of exit discharge in accordance with 3-7.2 only where the building is protected throughout by an approved, automatic sprinkler system, and the distance of travel from the termination of the exit enclosure to an outside street door shall not exceed 50 ft (15 m).

3-8 Illumination of Means of Egress.

3-8.1 General.

3-8.1.1* Illumination of means of egress shall be provided in accordance with this section for every building and structure. For the purposes of this requirement, exit access shall include only designated stairs, aisles, corridors, ramps, escalators, and passageways leading to an exit. For the purposes of this requirement, exit discharge shall include only designated stairs, aisles, corridors, ramps, escalators, walkways, and exit passageways leading to a public way.

Exception No. 1: With permission of the authority having jurisdiction, illumination of means of egress shall not be required in industrial and storage occupancy structures that are occupied only during daylight hours, with skylights or windows arranged to provide the required level of illumination on all portions of the means of egress during these hours.

Exception No. 2: Assembly occupancy private party tents that are not larger than 1200 ft^2 (111.5 m^2) shall be exempt from illumination of means of egress requirements.

Exception No. 3: Open structures shall be exempt from illumination of means of egress requirements.

Exception No. 4: Towers occupied by not more than three persons shall be exempt from illumination of means of egress requirements.

3-8.1.2 Illumination of means of egress shall be continuous during the time that the conditions of occupancy require that the means of egress be available for use. Artificial lighting shall be employed at such places and for such periods of time as required to maintain the illumination to the minimum criteria values herein specified.

Exception: Automatic, motion sensor–type lighting switches shall be permitted within the means of egress, provided that switch controllers are equipped for fail-safe operation, illumination timers are set for a minimum 15-minute duration, and the motion sensor is activated by any occupant movement in the area served by the lighting units.

3-8.1.3* The floors and other walking surfaces within an exit and within the portions of the exit access and exit discharge designated in 3-8.1.1 shall be illuminated to values of at least 1 ft-candle (10 lux) measured at the floor.

Exception: In assembly occupancies, the illumination of the floors of exit access shall be at least 0.2 ft-candle (2 lux) during periods of performances or projections involving directed light.

3-8.1.4* Required illumination shall be arranged so that the failure of any single lighting unit will not result in an illumination level in any designated area of less than 0.2 ft-candle (2 lux).

3-8.1.5 The equipment or units installed to meet the requirements of Section 3-10 shall be permitted also to serve the function of illumination of means of egress, provided that all requirements of Section 3-8 for such illumination are met.

3-8.2 Sources of Illumination.

3-8.2.1* Illumination of means of egress shall be from a source considered reliable by the authority having jurisdiction.

3-8.2.2 Battery-operated electric lights and other types of portable lamps or lanterns shall not be used for primary illumination of means of egress. Battery-operated electric lights shall be permitted to be used as an emergency source to the extent permitted by Section 3-9.

3-9 Emergency Lighting and Standby Power.

3-9.1 General.

3-9.1.1* Emergency lighting facilities for means of egress shall be provided in accordance with this section for the following:

(a) Every building or structure where required in Table 3-9.1.1

(b) Windowless and underground structures as defined in Section 2-2

Exception to (b): One- and two-family dwellings.

(c) High-rise buildings as defined in Section 2-2

(d) At doors equipped with delayed egress locks

(e) The stair shaft and vestibule of smokeproof enclosures. A standby generator that is installed for the smokeproof enclosure mechanical ventilation equipment shall be permitted to be used for such stair shaft and vestibule power supply.

For the purposes of this requirement, exit access shall include only designated stairs, aisles, corridors, ramps, escalators, and passageways that lead to an exit. For the purposes of this requirement, exit discharge shall include only designated stairs, ramps, aisles, walkways, and escalators that lead to a public way.

Exception No. 1: Towers shall be exempt from emergency lighting requirements under the following conditions:

(a) Where occupied by not more than three persons

(b) In locations not routinely inhabited by humans

(c) In structures occupied only during daylight hours, with windows arranged to provide the required level of illumination of all portions of the means of egress during these hours, upon approval of the authority having jurisdiction

Exception No. 2: Water-surrounded structures shall be exempt from emergency lighting in the following:

(a) Locations not routinely inhabited by humans

(b) In structures occupied only during daylight hours, with windows arranged to provide the required level of illumination of all portions of the means of egress during these hours, upon approval of the authority having jurisdiction

Table 3-9.1.1 Emergency Lighting Requirements

Occupancy	Conditions	Exceptions
Assembly	—	Private party tents <1200 ft^2 (111.5 m^2)
Educational	For interior stairs and corridors, normally occupied spaces, flexible and open-plan area, interior or windowless portions, shops and labs	Exempted from administrative areas, general classrooms, mechanical rooms, and storage rooms
Health care		
Hospital, nursing home, limited care	And supply the required power from life safety branch of electricals *(see NFPA 99)* if using life-support systems	
Ambulatory health care centers	And supply from the required power essential electrical system *(see NFPA 99)* if using life-support systems for other than emergency purposes only	—
Detention and correctional	—	—
Residential		
Hotels and dormitories	>25 rooms	All rooms direct to grade
Apartment buildings	>12 units or >3 stories	All apartments direct to grade
Board and care, large	>25 rooms	All rooms direct to grade
Mercantile	>1 story or >3000 ft^2 (280 m^2) gross sales area, and malls	—
Business	≥2 stories above LED, or ≥50 people above or below LED, or ≥300 people total	—
Industrial	—	Special purpose without routine occupancy, or daylight operations with windows
Storage	—	Not normally occupied, or daylight operations with windows
Day-care centers	For interior stairs and corridors, normally occupied spaces, flexible, and open-plan area, interior or windowless portions, shops and labs	Exempted from administrative areas, general classrooms, mechanical rooms, and storage rooms

3-9.1.2 Where maintenance of illumination depends on changing from one energy source to another, a delay of not more than 10 seconds shall be permitted.

3-9.2 Performance of System.

3-9.2.1* Emergency illumination shall be provided for a period of $1\frac{1}{2}$ hours in the event of failure of normal lighting. Emergency lighting facilities shall be arranged to provide ini-

tial illumination that is at least an average of 1 ft-candle (10 lux) and a minimum at any point of 0.1 ft-candle (1 lux) measured along the path of egress at floor level. Illumination levels shall be permitted to decline to an average of 0.6 ft-candle (6 lux) and a minimum at any point of 0.06 ft-candle (0.6 lux) at the end of the emergency lighting time duration. A maximum-to-minimum illumination uniformity ratio of 40 to 1 shall not be exceeded.

3-9.2.2* The emergency lighting system shall be arranged to provide the required illumination automatically in the event of any interruption of normal lighting, such as any failure of public utility or other outside electrical power supply; the opening of a circuit breaker or fuse; or any manual act(s), including accidental opening of a switch controlling normal lighting facilities.

3-9.2.3 Emergency generators that provide power to emergency lighting systems shall be installed in accordance with NFPA 110, *Standard for Emergency and Standby Power Systems.* Stored electrical energy systems, where required in this *Code*, shall be installed in accordance with NFPA 111, *Standard on Stored Electrical Energy Emergency and Standby Power Systems.*

3-9.2.4* Battery-operated emergency lights shall use only reliable types of rechargeable batteries provided with suitable facilities for maintaining them in properly charged condition. Batteries used in such lights or units shall be approved for their intended use and shall comply with NFPA 70, *National Electrical Code.*

3-9.2.5 The emergency lighting system shall be either continuously in operation or shall be capable of repeated automatic operation without manual intervention.

3-9.3 Standby Power. High-rise buildings shall be provided with Class 1, Type 60 standby power in accordance with NFPA 70, *National Electrical Code*, and NFPA 110, *Standard for Emergency and Standby Power Systems.* The standby power system shall have a capacity and rating sufficient to supply all required equipment. Selective load pickup and load shedding shall be permitted in accordance with NFPA 70, *National Electrical Code.* The standby power system shall be connected to the following:

(a) Emergency lighting system
(b) At least one elevator serving all floors and transferable to any elevator
(c) Mechanical equipment for smokeproof enclosures

3-10 Marking of Means of Egress.

3-10.1 General.

3-10.1.1 Means of egress shall be marked in accordance with this section for every building and structure.

Exception No. 1: In educational occupancies, where locations of exits are otherwise obvious and familiar to occupants.

Exception No. 2: In detention and correctional occupancies, in residential housing areas.

Exception No. 3: In mercantile occupancies, where an exit is immediately apparent from all portions of the sales area.

Exception No. 4: In apartment buildings that require only one exit. (See 3-4.1 Exception No. 6.)

Exception No. 5: In assembly occupancies, exit markings shall not be required on the seating side of vomitories from seating areas where exit marking is provided in the concourse, and such marking is readily apparent from the vomitories.

Exception No. 6: Open structures shall be exempt from marking of means of egress requirements.

Exception No. 7: Towers shall be exempt from marking of means of egress requirements under the following conditions:

(a) Where occupied by not more than three persons
(b) In locations not routinely inhabited by humans

Exception No. 8: Water-surrounded structures not routinely inhabited by humans shall be exempt from emergency lighting requirements.

3-10.1.2* Exits shall be marked by an approved sign readily visible from any direction of exit access.

Exception: Main exterior exit doors that obviously and clearly are identifiable as exits.

3-10.1.3 At each door into an exit stair enclosure, tactile signage stating "EXIT" and complying with ICC/ANSI A117.1, *American National Standard for Accessible and Usable Buildings and Facilities*, shall be installed adjacent to the latch side of the door 60 in. (152 cm) above the finished floor to the centerline of the sign.

3-10.1.4* Access to exits shall be marked by approved, readily visible signs in all cases where the exit or path to reach it is not readily apparent to the occupants. Sign placement shall be such that no point in the exit access corridor is more than 100 ft (30 m) from the nearest sign.

3-10.1.5 Exit stair enclosures in underground structures that have a floor level used for human occupancy more than 30 ft (9.1 m), or more than one level, below the lowest level of exit discharge shall be provided with signage in accordance with 3-2.2.5.4 at each floor level landing traversed in traveling to the exit discharge. The signs shall include a chevron-shaped indicator to show direction to the exit discharge.

3-10.1.6* Where floor proximity exit signs are required elsewhere in this *Code,* exit signs shall be placed near the floor level in addition to those signs required for doors or corridors. These signs shall be sized and illuminated in accordance with 3-10.2 and 3-10.3. The bottom of the sign shall be at least 6 in. (15.2 cm) but not more than 8 in. (20.3 cm) above the floor. For exit doors, the sign shall be mounted on the door, or adjacent to the door, with the nearest edge of the sign within 4 in. (10.2 cm) of the door frame.

3-10.1.7* Every sign required in Section 3-10 shall be located and of such size, distinctive color, and design as to be readily visible, and shall provide contrast with decorations, interior finish, or other signs. No decorations, furnishings, or equipment that impairs visibility of an exit sign shall be permitted, nor shall there be any brightly illuminated sign (for other than exit purposes), display, or object in or near the line of vision of the required exit sign of such a character as to detract attention from the exit sign.

3-10.1.8* Where floor proximity egress path marking is required elsewhere in this chapter, a listed and approved floor proximity egress path marking system that is internally illuminated shall be installed within 8 in. (20.3 cm) of the floor. The system shall provide a visible delineation of the path of travel along the designated exit access and shall be essentially continuous, except as interrupted by doorways, hallways, corridors, or other such architectural features. The system shall operate continuously or at any time the building fire alarm system is activated. The activation, duration, and continuity of operation of the system shall be in accordance with 3-9.2.

3-10.1.9* Exit Marking in Special Amusement Buildings.

3-10.1.9.1 Special amusement buildings, regardless of occupant load, shall meet the requirements of 3-10.1.9.2 through 3-10.1.9.5.

Exception: A building in which the multilevel play structures are not more than 10 ft (3 m) in height and have aggregate horizontal projections not more than 160 ft² (14.9 m²).

3-10.1.9.2 Exit marking shall be in accordance with Section 3-10.

3-10.1.9.3 Exit marking in mobile special amusement buildings shall be internally illuminated and comply with 3-10.2.2 and 3-10.3.3.

3-10.1.9.4 Floor proximity exit signs shall be provided in accordance with 3-10.1.6.

3-10.1.9.5* In special amusement buildings, where mazes, mirrors, or other designs are used to confound the egress path, approved directional exit marking that will become apparent in an emergency shall be provided.

3-10.2* Size of Signs.

3-10.2.1† Externally illuminated signs required by 3-10.1 and 3-10.4.1.1 shall have the word "EXIT" or other appropriate wording in plainly legible letters not less than 6 in. (15.2 cm) high with the principal strokes of letters not less than $^3/_4$ in. (1.9 cm) wide. The word "EXIT" shall have letters of a width not less than 2 in. (5 cm), except the letter "I," and the minimum spacing between letters shall be not less than $^3/_8$ in. (1 cm). Signs larger than the minimum established in this paragraph shall have letter widths, strokes, and spacing in proportion to their height.

Exception: Marking required by 3-10.1.3 and 3-10.1.8.

3-10.2.2*† Internally illuminated signs required by 3-10.1 and 3-10.4.1.1 shall have the word "EXIT" or other appropriate wording in letters legible from a distance of at least 100 ft (30 m) under all normal and emergency lighting conditions [30 ft-candle (300 lux) and 1 ft-candle (10 lux), respectively]. Internally illuminated signs shall be listed in accordance with UL 924, *Standard for Safety Emergency Lighting and Power Equipment.*

Exception: Marking required by 3-10.1.3 and 3-10.1.8.

3-10.3* Illumination of Signs.

3-10.3.1* Every sign required by 3-10.1.2 or 3-10.1.4 shall be suitably illuminated by a reliable light source. Externally and internally illuminated signs shall be legible in both the normal and emergency lighting mode.

3-10.3.2* Externally illuminated signs shall be illuminated by not less than 5 ft-candles (54 lux) on the face of the sign and shall have a contrast ratio of not less than 0.5.

3-10.3.3*† The visibility of an internally illuminated sign shall be the equivalent of an externally illuminated sign that complies with 3-10.3.2.

Exception: Listed, self-luminous, or electroluminescent signs that provide evenly illuminated letters shall have a minimum luminance of 0.06 footlambert (0.21 cd/m²) as measured by a color-corrected photometer. Signs shall be located such that the viewing distance along the path of egress is not more than the sign's marked rating.*

3-10.3.4* Every sign required to be illuminated by 3-10.3 shall be continuously illuminated as required under the provisions of Section 3-8.

Exception: Illumination for signs shall be permitted to flash on and off upon activation of the fire alarm system.*

3-10.3.5 Where emergency lighting facilities are required by 3-9.1.1, the exit signs shall be illuminated by the emergency lighting facilities. The level of illumination of the exit sign shall be at the levels provided in accordance with 3-10.3.2 or 3-10.3.3 for the required emergency lighting time duration as specified in 3-9.2.1, but shall be permitted to decline to 60 percent of the illumination level at the end of the emergency lighting time duration.

Exception: Approved self-luminous signs.

3-10.4 Specific Requirements.

3-10.4.1 Directional Signs.

3-10.4.1.1* A sign that complies with 3-10.2 reading "EXIT," or a similar designation with a directional indicator showing the direction of travel, shall be placed in every location where the direction of travel to reach the nearest exit is not apparent. Directional signs shall be listed.

3-10.4.1.2*† Directional Indicator. The directional indicator shall be located outside of the EXIT legend, not less than $^3/_8$ in. (1 cm) from any letter, and shall be permitted to be integral to or separate from the sign body. The directional indicator shall be of a chevron type as shown in Figure 3-10.4.1.2 and shall be identifiable as a directional indicator at a minimum distance of 40 ft (12.2 m) at 30 ft-candle (300 lux) and 1 ft-candle (10 lux) average illumination on the floor representing normal and emergency lighting levels, respectively. The directional indicators shall be located at the end of the sign for the direction indicated.

Figure 3-10.4.1.2 Chevron-type indicator.

3-10.4.2*† Special Signs. Any door, passage, or stairway that is neither an exit nor a path of exit access and that is located or arranged so that it is likely to be mistaken for an exit shall be identified by a sign reading "NO EXIT." Such sign shall have the word "NO" in letters 2 in. (5 cm) high with a stroke width of $^3/_8$ in. (1 cm) and the word "EXIT" in letters 1 in. (2.5 cm) high with the word "EXIT" below the word "NO."

3-10.4.3 Elevator Signs. Elevators that are a part of a means of egress *(see 3-2.13.1)* shall have the following signs, with a minimum letter height of $^5/_8$ in. (1.6 cm), in every elevator lobby:

(a)* Signs that indicate that the elevator can be used for egress including any restrictions on use

(b)* Signs that indicate the operational status of elevators

3-11 Special Provisions for Occupancies with High-Hazard Contents. *(See Section 1-7.)*

3-11.1* Where the contents are classified as high hazard, exits of such types and numbers shall be provided and arranged to permit all occupants to escape from the building or structure or from the hazardous area thereof to the outside or to a place

of safety with a travel distance of not more than 75 ft (23 m), measured as required in 3-6.2.

3-11.2 Egress capacity for high-hazard contents areas shall be based on 0.7 in. per person (1.8 cm per person) for stairs or 0.4 in. per person (1.0 cm per person) for level components and ramps in accordance with 3-3.3.1.

3-11.3 At least two means of egress shall be provided from each building or hazardous area thereof.

Exception: Rooms or spaces not more than 200 ft² (18.6 m²) and having an occupant load of not more than three persons and a travel distance to the room door of not more than 25 ft (7.6 m).

3-11.4 Means of egress shall be arranged so that there are no dead ends in corridors.

Exception: Spaces meeting the requirements of the Exception to 3-11.3.

3-11.5 Doors that serve high-hazard contents areas with occupant loads of more than five shall be permitted to be provided with a latch or lock only if it is panic hardware or fire exit hardware that complies with 3-2.1.7.

3-12 Mechanical Equipment Rooms, Boiler Rooms, and Furnace Rooms.

3-12.1 Mechanical equipment rooms, boiler rooms, furnace rooms, and similar spaces shall be arranged to limit common path of travel to not more than 50 ft (15 m).

Exception: A common path of travel not more than 100 ft (30 m) shall be permitted in either of the following:

(a) In buildings protected throughout by an approved, supervised automatic sprinkler system

(b) In mechanical equipment rooms with no fuel-fired equipment

3-12.2 Stories used exclusively for mechanical equipment, furnaces, or boilers shall be permitted to have a single means of egress where the travel distance to an exit on that story is not more than the common path of travel limitations of 3-12.1.

3-13 Subdivision of Building Space via Smoke Barriers.

3-13.1 Health Care Occupancies.

3-13.1.1 Buildings containing health care facilities shall be subdivided by smoke barriers as follows:

(a) To divide every story used by inpatients for sleeping or treatment into at least two smoke compartments
(b) To divide every story having an occupant load of 50 or more persons, regardless of use, into at least two smoke compartments
(c) To limit the size of each smoke compartment required by (a) and (b) to an area not exceeding 22,500 ft² (2100 m²)

Exception to (c): The area of an atrium shall not be limited in size.

(d) To limit the travel distance from any point to reach a door in the required smoke barrier to 200 ft (60 m)

Exception No. 1: Stories that do not contain a health care occupancy, located totally above the health care occupancy.

Exception No. 2: Areas that do not contain a health care occupancy and that are separated from the health care occupancy by a fire barrier that complies with 3-2.4.2.

Exception No. 3: Stories that do not contain health care occupancies and that are more than one story below the health care occupancy.

Exception No. 4: Open-air parking structures protected throughout by an approved, supervised automatic sprinkler system.

3-13.1.2 Smoke barriers shall be provided on stories that are usable but unoccupied.

3-13.1.3 Any required smoke barrier shall have a fire resistance rating of at least 1 hour.

Exception No. 1: Where an atrium is used, smoke barriers shall be permitted to terminate at an atrium wall. A minimum of two separate smoke compartments shall be provided on each floor.

Exception No. 2: Dampers shall not be required in duct penetrations of smoke barriers in fully ducted heating, ventilating, and air-conditioning systems.*

3-13.1.4 At least 30 net ft² (2.8 net m²) per patient in a hospital or nursing home or 15 net ft² (1.4 net m²) per resident in a limited care facility shall be provided within the aggregate area of corridors, patient rooms, treatment rooms, lounge or dining areas, and other low-hazard areas on each side of the smoke barrier. On stories not housing bed or litter patients, at least 6 net ft² (0.56 net m²) per occupant shall be provided on each side of the smoke barrier for the total number of occupants in adjoining compartments.

3-13.1.5* Doors in smoke barriers shall be substantial doors, such as $1^3/_4$-in. (4.4-cm) thick, solid bonded wood core, or of construction that will resist fire for at least 20 minutes. Nonrated factory- or field-applied protective plates extending not more than 48 in. (122 cm) above the bottom of the door shall be permitted. Cross-corridor openings in smoke barriers shall be protected by a pair of swinging doors or a horizontal sliding door that complies with 3-2.1.14. Swinging doors shall be arranged so that each door will swing in a direction opposite from the other.

The minimum clear width for swinging doors shall be as follows:

(a) Hospitals and nursing homes — 41.5 in. (105 cm)
(b) Psychiatric hospitals and limited care facilities — 32 in. (81 cm)

The minimum clear width opening for horizontal sliding doors shall be as follows:

(a) Hospitals and nursing homes — 83 in. (211 cm)
(b) Psychiatric hospitals and limited care facilities — 64 in. (163 cm)

3-13.1.6* Doors in smoke barriers shall be self-closing or automatic-closing in accordance with 3-2.1.8.

3-13.1.7* Vision panels that consist of fire-rated glazing or wired glass panels in approved frames shall be provided in each cross-corridor swinging door and at each cross-corridor horizontal sliding door in a smoke barrier.

3-13.1.8 Rabbets, bevels, or astragals shall be required at the meeting edges, and stops shall be required at the head and sides of door frames in smoke barriers. Positive latching hardware shall not be required. Center mullions shall be prohibited.

3-13.2 Ambulatory Health Care Facilities.

3-13.2.1 The ambulatory health care facility shall be divided into at least two smoke compartments on patient treatment floors.

Exception: Facilities of less than 5000 ft² (465 m²) and protected by an approved, automatic smoke detection system.

3-13.2.2 Any required smoke barrier shall have a fire resistance rating of at least 1 hour.

Exception: Dampers shall not be required in duct penetrations of smoke barriers in fully ducted heating, ventilating, and air-conditioning systems for buildings protected throughout by an approved, supervised automatic sprinkler system.

3-13.2.3 Vision panels in the smoke barrier shall be of fixed fire window assemblies.

3-13.2.4 At least 15 net ft^2 (1.4 net m^2) per ambulatory health care facility occupant shall be provided within the aggregate area of corridors, patient rooms, treatment rooms, lounges, and other low-hazard areas on each side of the smoke compartment for the total number of occupants in adjoining compartments. Smoke barriers shall be provided to limit the size of each smoke compartment to an area not exceeding 22,500 ft^2 (2100 m^2) and to limit the travel distance from any point to reach a door in the required smoke barrier to 200 ft (60 m).

Exception: The area of an atrium shall not be limited in size.

3-13.2.5* Doors in smoke barriers shall be at least $1^3/_4$-in. (4.4-cm) thick, solid bonded wood core or the equivalent and shall be self-closing. A vision panel shall be required.

3-13.2.6 Doors in smoke barriers shall normally be kept closed, or, if held open, they shall be equipped with automatic devices that will release the doors upon activation of the following:

(a) The fire alarm system, and either
(b) A local smoke detector, or
(c) A complete automatic fire-extinguishing system or complete automatic fire detection system

3-13.3 Detention and Correctional Occupancies.

3-13.3.1 Smoke barriers shall be provided to divide every story used for sleeping by residents, or any other story having an occupant load of 50 or more persons, into a minimum of two compartments.

Exception No. 1: Protection shall be permitted to be accomplished with horizontal exits. (See 3-2.4.)

Exception No. 2: Smoke compartments having direct exit to a public way; a building separated from the resident housing area by a 2-hour fire resistance rating or 50 ft (15 m) of open space; or a secured open area having a holding space located 50 ft (15 m) from the housing area that provides 15 ft^2 (1.4 m^2) or more of refuge area for each person (resident, staff, visitors) potentially present at the time of a fire fulfills the requirements for subdivision of such spaces, provided the locking arrangement of the direct exit doors involved meets the requirements for doors at the smoke barrier for the applicable use condition.*

3-13.3.2 Where smoke barriers are required by 3-13.3.1, smoke barriers shall be provided to limit the following:

(a) The housing to a maximum of 200 residents in any smoke compartment
(b) The travel distance to a door in a smoke barrier
    1. From any room door required as exit access to a maximum of 100 ft (30 m)
    2. From any point in a room to a maximum of 150 ft (45 m)

Exception to (b): The maximum permitted travel distance shall be increased by 50 ft (15 m) in smoke compartments protected throughout by an approved, automatic sprinkler system or smoke control system.

3-13.3.3* Any required smoke barrier shall be of substantial construction and shall have structural fire resistance.

3-13.3.4 Openings in smoke barriers shall be protected.

Exception No. 1: There shall be no restriction on the total number of vision panels in any barrier.*

Exception No. 2: Sliding doors in smoke barriers that are designed to normally be kept closed and are remotely operated from a continuously attended location shall not be required to be self-closing.

3-13.3.5 At least 6 net ft^2 (0.56 net m^2) per occupant shall be provided on each side of the smoke barrier for the total number of occupants in adjoining compartments. This space shall be readily available wherever occupants are moved across the smoke barrier in a fire emergency.

3-13.3.6 Doors shall provide resistance to the passage of smoke. Swinging doors shall be self-latching, or the opening resistance of the door shall be a minimum of 5 lbf (22 N).

3-13.3.7 Doors in smoke barriers shall conform with the requirements for doors in means of egress and shall have locking and release arrangements according to the applicable use condition. The provisions of the Exception to 3-2.1.6.3.2 shall not be used for smoke barrier doors that serve a smoke compartment containing more than 20 persons.

3-13.3.8 Vision panels shall be provided in smoke barriers at points where the barrier crosses an exit access corridor.

3-13.3.9 Smoke dampers shall be provided.

Exception: Other arrangements and positioning of smoke detectors shall be permitted to prevent damage or tampering or to be used for other purposes, provided the function of detecting any fire is fulfilled, and the placement of detectors is such that the speed of detection shall be equivalent to that provided by the required spacing and arrangement.

3-13.3.10 Means shall be provided to evacuate smoke from the smoke compartment of fire origin. Any of the following means shall be acceptable:

(a) Operable windows on at least two sides of the building, spaced not more than 30 ft (9.1 m) apart, that provide openings with minimum dimensions of not less than 22 in. (56 cm) in width and 24 in. (61 cm) in height
(b)* Manual or automatic smoke vents
(c) Engineered smoke-control system
(d) Mechanical exhaust system providing at least six air changes per hour
(e) Another method acceptable to the authority having jurisdiction

Exception: Buildings protected throughout by an approved, automatic sprinkler system.

3-14 Special Provisions for Assembly Occupancy Seating.

3-14.1* Seating Arranged in Rows. Minimum clear widths of aisles and other means of egress serving theater-type seating, or similar seating arranged in rows, shall be in accordance with Table 3-14.1. The minimum clear widths shown shall be modified in accordance with all of the following:

(a) If risers exceed 7 in. (17.8 cm) in height, multiply the stair width in the table by factor A, where

$$A = 1 + \frac{\text{riser height} - 7}{5}$$

(b) Stairs not having a handrail within a 30-in. (76-cm) horizontal distance shall be 25 percent wider than otherwise calculated; that is, multiply by factor *B*, which equals 1.25.

(c) Ramps steeper than 1 in 10 slope where used in ascent shall have their width increased by 10 percent; that is, multiply by factor *C*, which equals 1.10.

Exception No. 1: Lighting and access catwalks.

Exception No. 2: Grandstands, bleachers, and folding and telescopic seating.

Table 3-14.1 Capacity Factors

No. of Seats	Nominal Flow Time (sec)	Inch of Clear Width Per Seat Served: Stairs	Inch of Clear Width Per Seat Served: Passageways, Ramps, and Doorways
Unlimited	200	0.300 *AB*	0.220 *C*

Note: For SI units, 1 in. = 2.54 cm.

3-14.2 General Requirements for Access and Egress Routes Within Assembly Areas.

3-14.2.1 Festival seating shall be prohibited within a building. *(See definition of Festival Seating in Section 2-2.)*

Exception No. 1: Festival seating shall be permitted in assembly occupancies that have occupant loads of 1000 or less.

Exception No. 2: Festival seating shall be permitted in assembly occupancies with occupant loads greater than 1000 with an approved life safety evaluation. (See 3-14.9.)

3-14.2.2* The width of aisle accessways and aisles shall provide sufficient egress capacity for the number of persons accommodated by the catchment area served by the aisle accessway or aisle. Where aisle accessways or aisles converge to form a single path of egress travel, the required egress capacity of that path shall not be less than the combined required capacity of the converging aisle accessways and aisles.

3-14.2.3 Those portions of aisle accessways and aisles where egress is possible in either of two directions shall be uniform in required width.

Exception: Those portions of aisle accessways where the required width, not including the seat space described by 3-14.5.2, does not exceed 12 in. (30.5 cm).

3-14.2.4 In the case of side boundaries, other than nonfixed seating at tables, for aisle accessways or aisles, the clear width shall be measured to boundary elements such as walls, guardrails, handrails, edges of seating, tables, and side edges of treads, with the measurement made horizontally to the vertical projection of the elements resulting in the smallest width measured perpendicularly to the line of travel.

3-14.3* Aisle Accessways Serving Seating Not at Tables.

3-14.3.1* To determine the required clear width of aisle accessways between rows of seating, horizontal measurements shall be made (between vertical planes) from the back of one seat to the front of the most forward projection of the seat immediately behind it. Where the entire row consists of automatic or self-rising seats that comply with ASTM F 851, *Standard Test Method for Self-Rising Seat Mechanisms*, the measurement shall be permitted to be made with the seats in the up position.

3-14.3.2 The aisle accessway between rows of seating shall have a clear width of not less than 12 in. (30.5 cm), and this minimum shall be increased as a function of row length in accordance with 3-14.3.3 and 3-14.3.4.

Exception No. 1: If used by not more than four persons, there shall be no minimum clear width requirement for the portion of the aisle accessway that has a length not exceeding 6 ft (1.8 m) measured from the center of the seat farthest from the aisle.

Exception No. 2: The maximum number of seats permitted between the farthest seat in an aisle in grandstands, bleachers, and folding and telescopic seating shall not exceed that shown in Table 3-14.3.2 Exception No. 2.

Table 3-14.3.2 Exception No. 2 Maximum Number of Seats Permitted Between Farthest Seat and an Aisle

Application	*Outdoors*	*Indoors*
Grandstands	*11*	*6*
Bleachers (see 3-14.4.1 Exception No. 1)	*20*	*9*

3-14.3.3* Rows of seating served by aisles or doorways at both ends shall have no more than 100 seats per row. The 12-in. (30.5-cm) minimum clear width of aisle accessway between such rows shall be increased by 0.3 in. (0.8 cm) for every seat over a total of 14 but shall not be required to exceed 22 in. (55.9 cm).

Exception: Smoke-protected assembly seating as permitted by 3-14.10.4.

3-14.3.4 Rows of seating served by an aisle or doorway at one end only shall have a path of travel not exceeding 30 ft (9.1 m) in length from any seat to an aisle. The 12 in. (30.5 cm) minimum clear width of aisle accessway between such rows shall be increased by 0.6 in. (1.6 cm) for every seat over a total of seven.

Exception: Smoke-protected assembly seating as permitted by 3-14.10.5 and 3-14.10.6.

3-14.3.5 Rows of seating utilizing tablet-arm chairs shall be permitted only if the clear width of aisle accessways complies with the requirements of 3-14.3 where the tablet is in the usable position.

Exception: Tablet arms shall be permitted to be measured in the stored position where the tablet arm automatically returns to the stored position when raised manually to a vertical position in one motion and falls to the stored position by force of gravity.

3-14.3.6 The depth of seat boards shall not be less than 9 in. (23 cm) where the same level is not used for both seat boards and footboards. Footboards, independent of seats, shall be provided such that there is no horizontal opening permitting the passage of a $^1/_2$-in. (1.3-cm) diameter sphere.

3-14.4 Aisles Serving Seating Not at Tables.

3-14.4.1 Aisles shall be provided so that the number of seats served by the nearest aisle is in accordance with 3-14.3.2 through 3-14.3.4.

Exception No. 1: Aisles shall not be required in bleachers if all of the following conditions are met:

(a) Egress from front row is not obstructed by rail, guard, or other obstruction.

(b) Row spacing is 28 in. (71.1 cm) or less.

(c) Rise per row, including first row, is 6 in. (15.2 cm) or less.

(d) Number of rows does not exceed 16.

(e) Seat spaces are not physically defined.

(f) Seat boards that are also used as stepping surfaces for descent shall provide a walking surface with a minimum width of 12 in. (30.5 cm), and, where there is a depressed footboard, the gap between seat boards of adjacent rows shall not exceed 12 in. (30.5 cm) measured horizontally. Leading edges of such surfaces shall be provided with a contrasting marking stripe so that the location of such leading edge is readily apparent, particularly where viewed in descent. Such stripe shall be at least 1 in. (2.5 cm) wide and shall not exceed 2 in. (5.1 cm) in width. The marking stripe shall not be required where bleacher surfaces and environmental conditions under all conditions of use are such that the location of each leading edge is readily apparent, particularly when viewed in descent.

Exception No. 2: In seating composed entirely of bleachers, in which the row-to-row dimension is 28 in. (71 cm) or less, and from which front egress is not limited, aisles shall not be required to be more than 66 in. (168 cm) in width. Such aisles shall not be considered as dead-end aisles.

3-14.4.2 Dead-end aisles shall not exceed 20 ft (6.1 m) in length.

Exception No. 1: A longer dead-end aisle shall be permitted where seats served by the dead-end aisle are not more than 24 seats from another aisle, measured along a row of seats having a minimum clear width of 12 in. (30.5 cm) plus 0.6 in. (1.5 cm) for each additional seat over a total of seven in the row.

Exception No. 2: A 16-row, dead-end aisle shall be permitted in folding and telescopic seating and grandstands.

3-14.4.3 The minimum clear width of aisles shall be sufficient to provide egress capacity in accordance with 3-14.1, but shall be not less than the following:

(a) 48 in. (122 cm) for stairs having seating on each side

Exception to (a): 36 in. (91 cm) where aisle does not serve more than 50 seats.

(b) 36 in. (91 cm) for stairs having seating on only one side

(c) 23 in. (58 cm) between a handrail and seating or a guardrail where the aisle is subdivided by a handrail

(d) 42 in. (107 cm) for level or ramped aisles having seating on both sides

Exception to (d): 36 in. (91 cm) where aisle does not serve more than 50 seats.

(e) 36 in. (91 cm) for level or ramped aisles having seating on only one side

(f) 23 in. (58 cm) between a handrail or guardrail and seating where the aisle does not serve more than five rows on one side

3-14.4.4* Aisle Stairs and Ramps. Aisles that have a gradient steeper than 1 in 20, but not steeper than 1 in 8, shall consist of a ramp. Aisles that have a gradient steeper than 1 in 8 shall consist of an aisle stair. The Exception to 3-14.4.8 shall not apply.

Exception: Aisles in folding and telescopic seating shall be permitted to be by stepped aisles.

3-14.4.5 Aisle Stair Treads.

3-14.4.5.1 There shall be no variation exceeding $^3/_{16}$ in. (0.5 cm) in the depth of adjacent treads.

3-14.4.5.2* Treads shall be a minimum of 11 in. (27.9 cm).

3-14.4.5.3 All treads shall extend the full width of the aisle.

3-14.4.6 Aisle Stair Risers.

3-14.4.6.1 Riser heights shall be a minimum of 4 in. (10.2 cm).

Exception: The riser height of aisle stairs in folding and telescopic seating shall be permitted to be a minimum of $3^1/_2$ in. (8.9 cm) and a maximum of 11 in. (27.9 cm).

3-14.4.6.2 Riser heights shall not exceed 8 in. (20.3 cm).

Exception No. 1: Where the gradient of an aisle is steeper than 8 in. (20.3 cm) in rise in 11 in. (27.9 cm) of run (to maintain necessary sight lines in the adjoining seating area), the riser height shall be permitted to exceed 8 in. (20.3 cm) but shall not exceed 9 in. (22.9 cm).

Exception No. 2: The riser height of aisle stairs in folding and telescopic seating shall be permitted to be a minimum of $3^1/_2$ in. (8.9 cm) and a maximum of 11 in. (27.9 cm).

3-14.4.6.3 Riser heights shall be designed to be uniform in each aisle, and the construction-caused nonuniformities shall not exceed $^3/_{16}$ in. (0.5 cm) between adjacent risers.

Exception: Riser height shall be permitted to be nonuniform only for the purpose of accommodating necessary changes in gradient to maintain necessary sight lines within a seating area and shall be permitted to exceed $^3/_{16}$ in. (0.5 cm) in any flight. Where nonuniformities exceed $^3/_{16}$ in. (0.5 cm) between adjacent risers, the exact location of such nonuniformities shall be indicated by a distinctive marking stripe on each tread at the nosing or leading edge adjacent to the nonuniform risers.

3-14.4.7* Aisle Handrails.

3-14.4.7.1 Ramped aisles that have a gradient exceeding 1 in 12 and aisle stairs shall be provided with handrails at one side or along the centerline.

3-14.4.7.2 Where there is seating on both sides of the aisle, the handrails required by 3-14.4.7.1 shall be discontinuous with gaps or breaks at intervals not exceeding five rows to facilitate access to seating and to permit crossing from one side of the aisle to the other. These gaps or breaks shall have a clear width of not less than 22 in. (55.9 cm) and not greater than 36 in. (91 cm) measured horizontally, and the handrail shall have rounded terminations or bends. Where handrails are provided in the middle of aisle stairs, there shall be an additional intermediate rail located approximately 12 in. (30 cm) below the main handrail.

Exception No. 1: Handrails shall not be required for ramped aisles that have a gradient not steeper than 1 in 8 and have seating on both sides.

Exception No. 2: The requirement for a handrail is satisfied by the use of a guard providing a rail that complies with the graspability requirements for handrails and is located at a consistent height between 34 in. (86 cm) and 42 in. (107 cm) measured vertically from the top of the rail to the leading edge (nosing) of stair treads or to the adjacent walking surface in the case of a ramp.

3-14.4.8* Aisle Marking. A contrasting marking stripe shall be provided on each tread at the nosing or leading edge such

that the location of such tread is readily apparent, particularly when viewed in descent. Such stripes shall be at least 1 in. (2.5 cm) wide and shall not exceed 2 in. (5 cm) in width.

Exception: The marking stripe shall not be required where tread surfaces and environmental conditions under all conditions of use are such that the location of each tread is readily apparent, particularly when viewed in descent.

3-14.5* Aisle Accessways Serving Seating at Tables.

3-14.5.1 The minimum required clear width of an aisle accessway shall be 12 in. (30.5 cm) where measured in accordance with 3-14.5.2 and increased as a function of length in accordance with 3-14.5.3.

Exception: If used by not more than four persons, there shall be no minimum clear width requirement for the portion of aisle accessway having a length not exceeding 6 ft (1.8 m) and located farthest from an aisle.*

3-14.5.2* Where nonfixed seating is located between a table and an aisle accessway, the measurement of required clear width of the aisle accessway shall be made to a line 19 in. (48.3 cm) away from the edge of the table. The 19-in. (48.3-cm) distance shall be measured perpendicularly to the edge of the table.

3-14.5.3* The minimum required clear width of an aisle accessway shall be increased beyond the 12-in. (30.5-cm) requirement by 0.5 in. (1.3 cm) for each additional 12 in. (30.5 cm) or fraction thereof beyond 12 ft (3.7 m) of aisle accessway length where measured from the center of the seat farthest from an aisle.

3-14.5.4 The path of travel along the aisle accessway shall not exceed 36 ft (10.9 m) from any seat to the closest aisle or egress doorway.

3-14.6 Aisles Serving Seating at Tables.

3-14.6.1* Aisles that contain steps or that are ramped, such as the aisles serving dinner theater–style configurations, shall comply with the requirements of 3-14.4.

3-14.6.2* The minimum width of aisles that serve seating at tables shall be 44 in. (112 cm) where serving an occupant load greater than 50 and 36 in. (91 cm) where serving an occupant load of 50 or fewer.

3-14.6.3* Where nonfixed seating is located between a table and an aisle, the measurement of required clear width of the aisle shall be made to a line 19 in. (48.3 cm) away from the edge of the table. The 19-in. (48.3-cm) distance shall be measured perpendicularly to the edge of the table.

3-14.7 Approval of Layouts. Where required by the authority having jurisdiction, plans drawn to scale showing the arrangement of furnishings or equipment shall be submitted to the authority by the building owner, manager, or authorized agent to substantiate conformance with the provisions of this section and shall constitute the only acceptable arrangement until revised or additional plans are submitted and approved.

Exception: Temporary deviations from the specifications of the approved plans shall be permitted, provided the occupant load is not increased and the intent of this section is maintained.

3-14.8 Guards and Railings.

3-14.8.1* Sightline-Constrained Rail Heights. Unless subject to the requirements of 3-14.8.2, a fascia or railing system that complies with the guard requirements of 3-2.2.4 and having a minimum height of 26 in. (66 cm) shall be provided where the floor or footboard elevation is more than 30 in. (76 cm) above the floor or grade below, and the fascia or railing system would otherwise interfere with sightlines of immediately adjacent seating.

3-14.8.2 At Foot of Aisles. A fascia or railing system that complies with the guard requirements of 3-2.2.4 shall be provided for the full width of the aisle where the foot of the aisle is more than 30 in. (76 cm) above the floor or grade below. The fascia or railing shall be a minimum of 36 in. (91 cm) high and shall provide a minimum 42 in. (107 cm) measured diagonally between the top of the rail and the nosing of the nearest tread.

3-14.8.3 At Cross Aisles.

3-14.8.3.1 Cross aisles located behind seating rows shall be provided with railings not less than 26 in. (66 cm) above the adjacent floor.

Exception: Where the backs of seats located at the front of the aisle project 24 in. (61 cm) or more above the adjacent floor of the aisle.

3-14.8.3.2 Where cross aisles are more than 30 in. (76 cm) above the floor or grade below, guards shall be provided in accordance with 3-2.2.4.

3-14.8.4 At Side and Back of Seating Areas. Guards that comply with the guard requirements of 3-2.2.4 shall be provided with a height not less than 42 in. (107 cm) above the aisle, aisle accessway, or footboard where the floor elevation is more than 30 in. (76 cm) above the floor or grade to the side or back of seating.

3-14.8.5 Below Seating. Openings between footboards and seat boards shall be provided with intermediate construction so that a 4-in. (10.2-cm) diameter sphere cannot pass through the opening.

3-14.8.6 Locations Not Requiring Guards.

3-14.8.6.1 Guards shall not be required on the audience side of stages, of raised platforms, and of other raised floor areas such as runways, ramps, and side stages used for entertainment or presentations.

3-14.8.6.2 Permanent guards shall not be required at vertical openings in the performance area of stages.

3-14.8.6.3 Guards shall not be required where the side of an elevated walking surface is required to be open for the normal functioning of special lighting or for access and use of other special equipment.

3-14.9 Life Safety Evaluation.

3-14.9.1 Where a life safety evaluation is required by other provisions of the *Code*, it shall be done by persons acceptable to the authority having jurisdiction. The life safety evaluation shall include a written assessment of safety measures for conditions listed in 3-14.9.2. The life safety evaluation shall be approved annually by the authority having jurisdiction and shall be updated for special or unusual conditions.

3-14.9.2 Life safety evaluations shall include an assessment of the following conditions and the related appropriate safety measures:

(a) Nature of the events and the participants and attendees
(b) Access and egress movement including crowd density problems

(c) Medical emergencies

(d) Fire hazards

(e) Permanent and temporary structural systems

(f) Severe weather conditions

(g) Earthquakes

(h) Civil or other disturbances

(i) Hazardous materials incidents within and near the facility

(j) Relationships among facility management, event participants, emergency response agencies, and others having a role in the events accommodated in the facility

3-14.9.3 Life safety evaluations shall include assessments of both building systems and management features upon which reliance is placed for the safety of facility occupants.

3-14.10* Smoke-Protected Assembly Seating.

3-14.10.1 Fire Protection Requirements. To be considered smoke protected, an assembly seating facility shall comply with the following:

(a) All enclosed areas with walls and ceilings in buildings or structures containing smoke-protected assembly seating shall be protected with an approved, automatic sprinkler system.

Exception No. 1 to (a): The floor area used for the contest, performance, or entertainment, provided the roof construction is more than 50 ft (15 m) above the floor level and use is restricted to low fire hazard uses.

Exception No. 2 to (a): Sprinklers shall be permitted to be omitted over the floor area used for contest, performance, or entertainment and over the seating areas, if an approved engineering analysis substantiates the ineffectiveness of the sprinkler protection due to building height and combustible loading.*

(b) All means of egress serving a smoke-protected assembly seating area shall be provided with smoke-actuated ventilation facilities or natural ventilation designed to maintain the level of smoke at least 6 ft (1.8 m) above the floor of the means of egress.

3-14.10.2 Life Safety Evaluation. For facilities to utilize the provisions of smoke-protected assembly seating, a life safety evaluation shall be done in accordance with 3-14.9.

3-14.10.3 For Table 3-14.10.3 the number of seats specified shall be within a single assembly space, and interpolation shall be permitted between the specific values shown. The minimum clear widths shown shall be modified in accordance with all of the following:

(a) If risers exceed 7 in. (17.8 cm) in height, multiply the stair width in the table by factor *A*, where

$$A = 1 + \frac{\text{riser height} - 7}{5}$$

(b) Stairs not having a handrail within a 30-in. (76-cm) horizontal distance shall be 25 percent wider than otherwise calculated; that is, multiply by factor *B*, which equals 1.25.

(c) Ramps steeper than 1 in 10 slope where used in ascent shall have their width increased by 10 percent; that is, multiply by factor *C*, which equals 1.10.

Table 3-14.10.3 Capacity Factors for Smoke-Protected Seating

		Inch of Clear Width per Seat Served	
Number of Seats	Nominal Flow Time (sec)	Stairs	Passageways, Ramps, and Doorways
2,000	200	0.300 *AB*	0.220 *C*
5,000	260	0.200 *AB*	0.150 *C*
10,000	360	0.130 *AB*	0.100 *C*
15,000	460	0.096 *AB*	0.070 *C*
20,000	560	0.076 *AB*	0.056 *C*
25,000 or more	600	0.060 *AB*	0.044 *C*

Note: For SI units, 1 in. = 2.54 cm.

3-14.10.4 With smoke-protected assembly seating for rows of seats served by aisles or doorways at both ends, there shall be not more than 100 seats per row and the minimum clear width of 12 in. (305 cm) for aisle accessways shall be increased by 0.3 in. (0.8 cm) for every additional seat beyond the number stipulated in Table 3-14.10.4, but the minimum clear width shall not be required to exceed 22 in. (55.9 cm).

Table 3-14.10.4 Smoke-Protected Assembly Seating

	Number of Seats per Row Permitted to Have a Minimum 12 in. (30.5 cm) Clear Width Aisle Accessway	
Total Number of Seats in the Space	Aisle or Doorway at Both Ends of Row	Aisle or Doorway at One End of Row
<4,000	14	7
4,000–6,999	15	7
7,000–9,999	16	8
10,000–12,999	17	8
13,000–15,999	18	9
16,000–18,999	19	9
19,000–21,999	20	10
≥22,000	21	11

3-14.10.5 With smoke-protected assembly seating for rows of seats served by an aisle or doorway at one end only, the aisle accessway minimum clear width of 12 in. (30.5 cm) shall be increased by 0.6 in. (1.6 cm) for every additional seat beyond the number stipulated in Table 3-14.10.4, but the minimum clear width shall not be required to exceed 22 in. (55.9 cm).

3-14.10.6 Smoke-protected assembly seating shall be permitted to have a common path of travel of 50 ft (15 m) from any seat to a point where a person has a choice of two directions of egress travel.

3-14.10.7 Aisle Termination. For smoke-protected assembly seating, the dead ends in aisle stairs shall not exceed a distance of 21 rows.

Exception: A longer dead-end aisle shall be permitted for smoke-protected assembly seating where seats served by the dead-end aisle are not more than 40 seats from another aisle, measured along a row of seats having an aisle accessway with a minimum clear width of 12 in. (30.5 cm) plus 0.3 in. (0.8 cm) for each additional seat above seven in the row.

3-14.10.8 For smoke-protected assembly seating, the travel distance from each seat to the nearest entrance to an egress vomitory portal or egress concourse shall not exceed 400 ft (122 m). The travel distance from the entrance to vomitory portal or from egress concourse to an approved egress stair, ramp, or walk at the building exterior shall not exceed 200 ft (60 m).

Exception: In outdoor assembly seating facilities of noncombustible or limited-combustible construction, where all portions of the means of egress are essentially open to the outside, the distance shall not be limited.

3-14.11 Grandstands, Bleachers, and Folding and Telescopic Seating.

3-14.11.1 Where bleacher or grandstand seating without backs is used indoors, rows of seats shall be spaced not less than 22 in. (55.9 cm) back to back.

3-14.11.2 Guards and Railings.

3-14.11.2.1 Railings or guards not less than 42 in. (107 cm) above the aisle surface or footrest or 36 in. (91 cm) vertically above the center of the seat or seat board surface, whichever is adjacent, shall be provided along those portions of the backs and ends of all grandstands and folding and telescopic seating where the seats are more than 4 ft (1.2 m) above the floor or ground.

Exception: Where an adjacent wall or fence affords equivalent safeguard.

3-14.11.2.2 If the front footrest of any grandstand or folding or telescopic seating is more than 2 ft (0.6 m) above the floor, then railings or guards not less than 33 in. (84 cm) above such footrests shall be provided.

Exception: In grandstands, or where the front row of seats includes backrests, the rails shall be not less than 26 in. (66 cm) high.

3-14.11.2.3 Cross aisles located within the seating area shall be provided with rails not less than 26 in. (66 cm) high along the front edge of the cross aisle.

Exception: Where the backs of the seats in front of the cross aisle project 24 in. (61 cm) or more above the surface of the cross aisle, the rail shall not be required.

3-14.11.2.4 Vertical openings between guardrails and footboards or seat boards shall be provided with intermediate construction so that a 4-in. (10.2-cm) diameter sphere cannot pass through the opening.

3-14.11.2.5 An opening between the seat board and footboard located more than 30 in. (76 cm) above grade shall be provided with intermediate construction so that a 4-in. (10.2-cm) diameter sphere cannot pass through the opening.

Chapter 4 Means of Escape

4-1* General.

4-1.1 The provisions of this chapter shall apply to the following:

(a) One- and two-family dwellings *(see Section 4-2)*
(b) Dwelling units in apartment buildings *(see Section 4-3)*
(c) Guest rooms or guest suites in hotels and dormitories *(see Section 4-4)*
(d) Lodging and rooming houses *(see Section 4-5)*
(e) Small board and care facilities *(see Section 4-6)*

4-1.2 The provisions of Chapter 3 shall not be applicable to means of escape unless specifically referenced in this chapter.

4-1.3 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 3.

4-2 One- and Two-Family Dwellings.

4-2.1 Number and Types of Means of Escape.

4-2.1.1 Number of Means of Escape. In any dwelling or dwelling unit of two rooms or more, every sleeping room and every living area shall have at least one primary means of escape and one secondary means of escape.

Exception: A secondary means of escape shall not be required under either of the following conditions:

(a) If the bedroom or living area has a door leading directly to the outside of the building at or to grade level

(b) If the dwelling unit is protected throughout by an approved, automatic sprinkler system

4-2.1.2 Primary Means of Escape. The primary means of escape shall be a door, stairway, or ramp that provides a means of unobstructed travel to the outside of the dwelling unit at street or ground level.

4-2.1.3* Secondary Means of Escape. The secondary means of escape shall be one of the following:

(a) A door, stairway, passage, or hall that provides a way of unobstructed travel to the outside of the dwelling at street or ground level that is independent of and remote from the primary means of escape

(b) A passage through an adjacent nonlockable space, independent of and remote from the primary means of escape, to any approved means of escape

(c)*An outside window or door operable from the inside without the use of tools, keys, or special effort and that provides a clear opening of not less than 5.7 ft^2 (0.53 m^2) with the width not less than 20 in. (51 cm) and the height not less than 24 in. (61 cm). The bottom of the opening shall be not more than 44 in. (112 cm) above the floor. Such means of escape shall be acceptable under any of the following conditions:

1. The window is within 20 ft (6.1 m) of grade.
2. The window is directly accessible to fire department rescue apparatus as approved by the authority having jurisdiction.
3. The window or door opens onto an exterior balcony.

4-2.1.4 Every story more than 2000 ft^2 (185 m^2) in area or with a travel distance to the primary means of escape of more than 75 ft (23 m) shall be provided with two primary means of escape that are remotely located from each other.

Exception: Buildings protected throughout by an approved, supervised automatic sprinkler system.

4-2.2 Arrangement of Means of Escape. No required path of travel in a means of escape from any room to the outside shall be through another room or apartment not under the immediate control of the occupant of the first room or through a bathroom or other space subject to locking.

4-2.3 Doors.

4-2.3.1 No door in the path of travel of a means of escape shall be less than 28 in. (71 cm) wide.

Exception: Bathroom doors shall be not less than 24 in. (61 cm) wide.

4-2.3.2 Doors shall be a minimum of 6 ft 6 in. (2 m) in nominal height.

4-2.3.3 Every closet door latch shall be such that children can open the door from inside the closet.

4-2.3.4 Every bathroom door shall be designed to allow opening from the outside during an emergency when locked.

4-2.3.5* No door in any means of escape shall be locked against egress when the building is occupied. All locking devices that impede or prohibit egress or that cannot be easily disengaged shall be prohibited.

4-2.4 Stairs, Landings, Ramps, Balconies, or Porches.

4-2.4.1 Stairs, ramps, guards, and handrails shall be in accordance with 3-2.2 for stairs and 3-2.5 for ramps.

Exception No. 1: The provisions of 3-2.2.5, 3-2.5.5, and 3-7.3 shall not apply.

Exception No. 2: If serving as a secondary means of escape, stairs that comply with the width, riser height, tread depth, and handrail requirements of Table 5-3.2.8(e), and ramps with slopes not steeper than 1 in 6 shall be permitted.

4-2.4.2 The minimum clear width of stairs, landings, ramps, balconies, and porches shall be 36 in. (91 cm) measured in accordance with 3-3.2.

4-2.4.3 Spiral stairs and winders in accordance with 3-2.2 shall be permitted within a single dwelling unit.

4-2.4.4 No sleeping rooms or living rooms shall be accessible by only a ladder, stair ladder, alternating tread device, folding stairs, or through a trap door.

4-2.5 Hallways. The minimum width of hallways shall be 36 in. (91 cm) measured in accordance with 3-3.2. The minimum height shall be not less than 7 ft (2.1 m) nominal height with projections from the ceiling providing not less than 6 ft 8 in. (203 cm) nominal height.

4-3 Dwelling Units in Apartment Buildings.

4-3.1 Means of escape within the apartment dwelling unit shall comply with the provisions of Section 4-2 for one- and two-family dwellings.

4-3.2 Within any individual apartment dwelling unit, stairs more than one story above or below the entrance floor level of the apartment dwelling unit shall not be permitted.

4-4 Guest Rooms or Guest Suites in Hotels and Dormitories. Means of escape within the guest room or guest suite shall comply with the provisions of Section 4-2 for one- and two-family dwellings. For the purpose of application of the requirements of Section 4-2, guest room and guest suite shall be synonymous with dwelling or living unit.

4-5 Lodging and Rooming Houses.

4-5.1 Number and Types of Means of Escape.

4-5.1.1 Every sleeping room and living area shall have access to a primary means of escape that complies with Section 4-2 for one- and two-family dwellings and is located to provide a safe path of travel to the outside. If the sleeping room is above or below the level of exit discharge, then the primary means of escape shall be an interior stair in accordance with 4-5.2, an exterior stair in accordance with 4-5.3, a horizontal exit in accordance with 3-2.4, or an existing fire escape stair in accordance with 5-3-2.8.

4-5.1.2 In addition to the primary route, each sleeping room and living area shall have a second means of escape in accordance with 4-2.1.3.

Exception: If the sleeping room or living area has a door leading directly outside the building with access to grade or to a stairway that meets the requirements for exterior stairs, that escape shall be considered as meeting all of the escape requirements for that sleeping room or living area.

4-5.1.3 Every story more than 2000 ft^2 (185 m^2) in area or with travel distance to the primary means of escape more than 75 ft (23 m) shall be provided with two primary means of escape that are remotely located from each other.

Exception: Buildings protected throughout by an approved, supervised automatic sprinkler system.

4-5.2 Interior stairways shall be enclosed by $^1/_2$-hour fire barriers with all openings protected with smoke-actuated automatic-closing or self-closing doors that have a fire protection rating comparable to that required for the enclosure. The stairway shall comply with 3-2.2.5.3.

Exception No. 1: Where an interior stair connects the street floor with the story next above or below only, but not both, the interior stair shall be required to be enclosed only on the street floor.

Exception No. 2: In buildings three or fewer stories in height that are protected throughout by an approved, automatic sprinkler system, stairways shall be permitted to be unprotected. However, in such cases, there shall still remain a primary means of escape from each sleeping area that does not require occupants to pass through a portion of a lower floor, unless that route is separated from all spaces on that floor by construction having a $^1/_2$-hour fire resistance rating.

4-5.3 Exterior stairs shall be protected against blockage caused by fire that would simultaneously expose both the interior and exterior means of escape. This shall be permitted to be accomplished through separation by physical distance, arrangement of the stairs, protection of the openings exposing the stairs, or other means acceptable to the authority having jurisdiction.

4-5.4 No door or path of travel in a means of escape shall be less than 28 in. (71 cm) wide.

Exception: Bathroom doors shall be not less than 24 in. (61 cm) wide.

4-5.5 Every closet door latch shall be such that it can be readily opened from the inside in case of emergency.

4-5.6 Every bathroom door shall be designed to allow it to be opened from the outside during an emergency when locked.

4-5.7 Winders in accordance with 3-2.2.2.4 shall be permitted.

4-5.8* No door in any means of escape shall be locked against egress when the building is occupied.

Exception: Delayed egress locks that comply with 3-2.1.6.1 shall be permitted, provided that not more than one such device is located in any one escape path.

4-5.9 Doors serving a single dwelling unit shall be permitted to be provided with a lock in accordance with 3-2.1.5.2.

4-5.10 Means of Escape Corridors. 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 air 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. Doors shall be self-closing or automatic-closing upon detection of smoke.

Exception: Door-closing devices shall not be required in buildings that are protected throughout by an approved, automatic sprinkler system.

4-6 Small Board and Care Facilities.

4-6.1 Number of Means of Escape. Each normally occupied story of the facility shall have at least two remotely located means of escape that do not involve using windows. At least one of these means of escape shall comply with 4-6.2.

Exception No. 1: In prompt evacuation capability facilities, one means of escape shall be permitted to involve windows that comply with 4-6.3(c).

Exception No. 2: A second means of escape from each story shall not be required if the entire building is protected throughout by an approved, automatic sprinkler system and the facility has two means of escape.

4-6.2 Primary Means of Escape. Every sleeping room and living area shall have access to a primary means of escape located to provide a safe path of travel to the outside. Where sleeping rooms or living areas are above or below the level of exit discharge, the primary means of escape shall be an interior stair in accordance with 4-6.4, an exterior stair, a horizontal exit, or an existing fire escape stair.

4-6.3 Secondary Means of Escape. In addition to the primary route, each sleeping room in small board and care homes that are not protected by an approved, automatic sprinkler system shall have a second means of escape that consists of one of the following:

(a) A door, stairway, passage, or hall providing a path of unobstructed travel to the outside of the dwelling at street or ground level that is independent of and remotely located from the primary means of escape

(b) A passage through an adjacent nonlockable space, independent of and remotely located from the primary means of escape, to any approved means of escape

(c)*An outside window or door operable from the inside without the use of tools, keys, or special effort, and that provides a clear opening of not less than 5.7 ft^2 (0.53 m^2) with the width not less than 20 in. (51 cm) and the height not less than 24 in. (61 cm). The bottom of the opening shall be not more than 44 in. (112 cm) above the floor. Such means of escape shall be acceptable under any of the following conditions:

1. The window is within 20 ft (6.1 m) of grade.
2. The window is directly accessible to fire department rescue apparatus, as approved by the authority having jurisdiction.
3. The window or door opens onto an exterior balcony.

Exception: If the sleeping room has a door leading directly to the outside of the building with access to grade or to a stairway that meets the requirements of exterior stairs, that means of escape shall be considered as meeting all the escape requirements for the sleeping room.

4-6.4 Interior Stairs Used for Primary Means of Escape. Interior stairs shall be enclosed with $^1/_2$-hour fire barriers with all openings equipped with smoke-actuated automatic-closing or self-closing doors that have a fire protection rating comparable to that required for the enclosure. Stairs shall comply with 3-2.2.5.3. The entire primary means of escape shall be arranged so that occupants are not required to pass through a portion of a lower story unless that route is separated from all spaces on that story by construction having a minimum $^1/_2$-hour fire resistance rating.

The supporting construction shall be protected to afford the required fire resistance rating of the wall supported in buildings of other than nonrated construction.

Exception No. 1: Stairs that connect a story at street level to only one other story shall be permitted to be open to the story that is not the street level.

Exception No. 2: For prompt and slow evacuation capability facilities in buildings three or fewer stories in height that have an approved, automatic sprinkler system using quick-response or residential sprinklers, stair enclosures shall not be required, provided there still remains a primary means of escape from each sleeping area that does not require occupants to pass through a portion of a lower floor, unless that route is separated from all spaces on that floor by construction having a $^1/_2$-hour fire resistance rating.

Exception No. 3: In buildings two or fewer stories in height that house prompt evacuation capability facilities with not more than eight residents, stair enclosures shall not be required.

4-6.5 Exterior stairs shall be reasonably protected against blockage caused by fire that would simultaneously expose both the interior and the exterior means of escape. This shall be accomplished through separation by physical distance, arrangement of the stairs, protection of the openings exposing the stairs, or other means acceptable to the authority having jurisdiction.

4-6.6 Doors.

4-6.6.1 No door or path of travel to a means of escape shall be less than 32 in. (81 cm) wide.

Exception No. 1: In conversions (see definition of Conversion in Section 2-2), 28-in. (71-cm) doors shall be permitted to continue to be used.

Exception No. 2: Bathroom doors shall be a minimum of 24 in. (61 cm) wide.

4-6.6.2 Every closet door latch shall be readily opened from the inside in case of an emergency.

4-6.6.3 Every bathroom door shall be designed to allow opening from the outside during an emergency when locked.

4-6.6.4 No door in any means of escape shall be locked against egress when the building is occupied.

Exception: Delayed egress locks that comply with 3-2.1.6.1 shall be permitted on exterior doors.

4-6.6.5 Door opening forces shall comply with 3-2.1.4.7.

4-6.6.6 Door latch releasing shall comply with 3-2.1.5.4.

4-6.7 Stairs.

4-6.7.1 Stairs shall comply with 3-2.2.

4-6.7.2 Winders that comply with 3-2.2.2.4 shall be permitted.

4-6.8 Means of Escape Corridors.

4-6.8.1 The separation walls of sleeping rooms shall be capable of resisting fire for at least $^1/_2$ hour, which is considered to be achieved if the partitioning is finished on both sides with lath and plaster or material that provides a 15-minute thermal barrier. Sleeping room doors shall be substantial doors, such as those of $1^3/_4$-in. (4.4-cm) thick, solid bonded wood core construction or of other construction of equal or greater stability and fire integrity. Any vision panels shall be fixed fire window assemblies or shall be wired glass not exceeding 1296 in.^{2} (84 cm^2) each in area and installed in approved frames.

Exception No. 1: In prompt evacuation capability facilities, all sleeping rooms shall be separated from the escape route by walls and doors that are at least smoke resistant.

Exception No. 2: Corridor walls and doors that are capable of resisting the passage of smoke and that are protected by approved, automatic sprinklers on both sides of the wall and door are exempted. In such instances, there shall be no limitation on the type or size of glass panels.

Exception No. 3: Sleeping arrangements that are not located in sleeping rooms shall be permitted for nonresident staff members, provided alarm audibility in the sleeping area is sufficient to awaken staff who might be sleeping.

4-6.8.2 There shall be no louvers or operable transoms or other air passages penetrating the wall except properly installed heating and utility installations other than transfer grilles. Transfer grilles shall be prohibited.

4-6.8.3 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.

4-6.8.4 Doors shall be self-closing or automatic-closing in accordance with 3-2.1.8.

Exception: Door-closing devices shall not be required in buildings that are protected throughout by an approved, automatic sprinkler system.

Chapter 5 Alterations, Repairs, or Change of Occupancy in Existing Structures

5-1 General.

5-1.1 Application. Means of egress in existing buildings undergoing alterations, repairs, or change of occupancy shall comply with Chapter 3 as modified by this chapter.

5-1.2 Chapter Format and Numbering. The provisions of this chapter serve as exemptions to the Chapter 3 new construction requirements for use in alterations, repairs, or change of occupancy in existing structures. The paragraph numbering of this chapter's exempting language repeats the numbering of the related paragraph in Chapter 3 but precedes the initial "3" with a "5-." For example, the exemption applicable to the requirements of 3-2.1.3 is numbered 5-3-2.1.3.

5-2 Exemptions from Chapter 3 Requirements.

5-3-1.1.1.3.4 Existing Corridor Doors in Large Board and Care Facilities. In large residential board and care facility buildings that are protected throughout by an approved, automatic sprinkler system, existing corridor doors in renovations and conversions that are nonrated doors that resist the passage of smoke shall be permitted to continue to be used. *(See definition of Conversion in Section 2-2.)*

5-3-1.1.3 Exit Passageway Enclosure Openings. Existing fixed wired glass panels in steel sash and fire windows shall be permitted to be continued in use in existing exit passageway separations in a building protected throughout by an approved, automatic sprinkler system.

5-3-2.1.3 Floor Level at Doors to the Exterior. If approved by the authority having jurisdiction, in existing buildings, 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 not more than 8 in. (20.3 cm) lower.

5-3-2.1.7.1(a) Panic Hardware and Fire Exit Hardware Mounting Height. The positioning of the actuating portion of the panic hardware or fire exit hardware shall be permitted to remain in the range of 30 in. (76 cm) to 48 in. (122 cm) above the floor.

5-3-2.2.2.1* Stair Dimensional Criteria. Existing stairs shall be permitted to remain in use, provided they meet the requirements for existing stairs shown in Table 5-3-2.2.2.1. Where approved by the authority having jurisdiction, existing stairs shall be permitted to be rebuilt in accordance with the table's dimensional criteria and in accordance with other *Code* requirements in 3-2.2 for stairs.

Table 5-3-2.2.2.1 Existing Stairs

Element	Dimension
Minimum width clear of all obstructions, except projections not more than $3^1/_2$ in. (8.9 cm) at or below handrail height on each side	44 in. (112 cm); 36 in. (91 cm) if total occupant load of all stories served by stairways is fewer than 50
Maximum height of risers	8 in. (20.3 cm)
Minimum tread depth	9 in. (22.9 cm)
Minimum headroom	6 ft 8 in. (203 cm)
Maximum height between landings	12 ft (3.7 m)
Landing	*(See 3-2.1.3 and 3-2.2.3.2.)*

5-3-2.2.4.2 Handrails at Sides of Stairs and Intermediate Handrails. Existing stairs and existing ramps shall have a handrail on at least one side. Existing handrails shall be provided within 44 in. (112 cm) of all portions of the required egress width of stairs.

5-3-2.2.4.3 Guard and Handrail Continuity. Existing handrails shall not be required to be continuous between flights of stairs at landings.

5-3-2.2.4.5.1 Handrail Minimum Height. Existing required handrails shall be at least 30 in. (76 cm) and not more than 38 in. (96 cm) above the upper surface of the tread, measured

vertically to the top of the rail from the leading edge of the tread.

5-3-2.2.4.5.2 Handrail Minimum Clearance to Wall. Existing handrails shall not be required to provide a minimum $1^1/_2$ in. (3.8 cm) clearance between the handrail and the wall to which it is fastened.

5-3-2.2.4.5.3 Handrail Grasp Continuity. Existing handrails shall not be required to be continuously graspable along the entire length.

5-3-2.2.4.5.4 Handrail Termination. Existing handrail ends shall not be required to be returned to the wall or floor or to terminate at newel posts.

5-3-2.2.4.5.5 Handrail Continuation Beyond Top and Bottom Riser. Where approved by the authority having jurisdiction because of space limitations, the horizontal extension of new handrails at the top of the flight shall not be required, provided that the handrail extends, at the required height, to a point directly above the top riser. Existing handrails shall not be required to extend beyond points above the top and bottom risers.

5-3-2.2.4.6.2* Guard Minimum Height. Existing guards on existing stairs shall be at least 30 in. (76 cm) high. Existing guards within dwelling units shall be at least 36 in. (91 cm) high.

5-3-2.2.4.6.3 Guard Openings Maximum Dimension. Subject to the approval of the authority having jurisdiction, existing guards shall not be required to meet the 4-in. (10.1-cm) diameter maximum opening requirement.

5-3-2.2.5.2 Stairway Exposure Protection. Existing stairways shall not be required to meet the fire resistance–rated wall 10-ft (3-m) extension provision.

5-3-2.3.1 Smokeproof Enclosures. Where approved by the authority having jurisdiction, existing smokeproof enclosures shall not be required to meet the provisions of 3-2.3.

5-3-2.4.4.2 Horizontal Exit Fire Compartment Exposure Protection. Existing horizontal exits shall not be required to meet the fire resistance–rated wall 10-ft (3-m) extension provision.

5-3-2.4.4.3 Duct Penetrations of Horizontal Exits. Existing duct penetrations protected by approved and listed fire dampers shall be permitted to remain.

5-3-2.4.4.6 Horizontal Exit Door Swing Direction. Horizontal exit doors in corridors no more than 6 ft (183 cm) wide in existing buildings shall not be required to be provided in pairs and shall be permitted to swing against the direction of egress travel. Existing horizontal exit doors in health care occupancies and detention and correctional occupancies shall be permitted to swing against the direction of egress travel.

5-3-2.4.4.8 Horizontal Exit Cross-Corridor Doors' Closers. Where approved by the authority having jurisdiction, existing doors in horizontal exits shall be permitted to be self-closing in lieu of automatic-closing.

5-3-2.4.5.2 Horizontal Exit Bridge and Balcony Width. Existing bridges or balconies shall be exempt from the minimum width provisions specified in 3-2.4.5.2.

5-3-2.4.5.4 Horizontal Exit Door Swing to Bridges and Balconies. Existing horizontal exit doors on both ends of the bridge or balcony shall be permitted to swing out from the building, where approved by the authority having jurisdiction.

5-3-2.4.5.6 Horizontal Exit Bridge and Balcony Exposure Protection. In existing buildings, where bridges have solid sides that are at least 6 ft (183 cm) in height, the exposure protection provisions of 3-2.4.5.6 shall not be required. Where approved by the authority having jurisdiction, existing bridges and balconies shall be exempt from the exposure protection provisions of 3-2.4.5.6.

5-3-2.5.2 Ramp Dimensional Criteria. New ramps built in existing buildings or facilities, where slopes necessitate a steepness greater than permitted for new construction, shall be permitted to have slopes not exceeding 1 in 10 for rises more than 3 in. (7.6 cm) but not more than 6 in. (15.2 cm); and shall be permitted to have slopes not exceeding 1 in 8 for rises not more than 3 in. (7.6 cm). Existing ramps shall be permitted to remain in use or be rebuilt if they meet the requirements shown in Table 5-3-2.5.2. Existing ramps with slopes not steeper than 1 in 6 shall be permitted to remain in use, where approved by the authority having jurisdiction.

Table 5-3-2.5.2 Existing and Rebuilt Ramps

Element	Dimension
Minimum width	30 in. (76 cm)
Maximum slope	1 in 8
Maximum height between landings	12 ft (3.7 m)

5-3-2.5.3.2 Ramp Landings. Existing ramps with slopes not steeper than 1 in 10 shall not be required to be provided with landings. Existing landings shall be permitted to be not more than 4 ft (122 cm) long in the direction of travel, provided the ramp has a straight run. Existing ramps shall be permitted to change direction without a landing.

5-3-2.8 Fire Escape Stairs. When approved by the authority having jurisdiction, fire escape stairs shall be permitted to constitute not more than 50 percent of the required means of egress in assembly, detention and correctional, hotel and dormitory, apartment building, mercantile, business, industrial, and storage occupancies. Such fire escape stairs shall comply with the following provisions:

(a)* *New Fire Escape Stairs.* New fire escape stairs shall be permitted to be erected on existing buildings only where approved by the authority having jurisdiction.

(b) *Arrangement.* Fire escape stairs shall be of the return platform–type with superimposed runs or the straight run–type with a platform that continues in the same direction. Fire escape stairs shall be permitted to be parallel to or at angles to buildings. Fire escape stairs shall be permitted to be attached to buildings or erected independently of buildings and connected by walkways.

(c)* *Protection of Openings.* Each opening shall be protected with approved fire door or fire window assemblies where the opening or any portion of the opening is located as follows.

1. *Horizontally.* If within 15 ft (4.5 m) of any balcony, platform, or stairway that constitutes a component of the fire escape stair.
2. *Below.* If within three stories or 35 ft (10 m) of any balcony, platform, walkway, or stairway that constitutes a component of the fire escape stair or within two stories or 20 ft (6 m) of a platform or walkway leading from any story to the fire escape stair.
3. *Above.* If within 10 ft (3 m) of any balcony, platform, or walkway as measured vertically or of any stair tread surface as measured vertically.
4. *Top Story.* Protection for wall openings shall not be required where stairs do not lead to the roof.
5. *Court.* Any wall facing a court served by a fire escape stair where the least dimension of the court is not greater than one-third of the height to the uppermost platform of the fire escape stair measured from the ground.
6. *Alcove.* Any wall facing an alcove served by a fire escape stair where the width of the alcove is not greater than one-third or the depth more than one-fourth of the height to the uppermost platform of the fire escape stair measured from the ground.

(d) *Access.*

1. Access to fire escape stairs shall be in accordance with 5-3-2.8(e) and 3-5.1.2. New fire escape stairs shall not incorporate ladders or access windows, regardless of occupancy classification or occupant load served.
2. Fire escape stairs shall extend to the roof in all cases where the roof is subject to occupancy or provides an area of refuge. If the roof has a pitch of 1 to 6 or less, fire escape ladders in accordance with 3-2.9 or alternating tread devices in accordance with 3-2.11 shall be provided for access to the roof.
3. Access to a fire escape stair shall be directly to a balcony, landing, or platform and shall be no higher than the floor or windowsill level and no lower than 8 in. (20.3 cm) below the floor level or 18 in. (45.7 cm) below the windowsill.

(e) *Stair Details.* Fire escape stairs shall comply with the requirements of Table 5-3-2.8(e).

Table 5-3-2.8(e) Fire Escape Stairs

Element	Serving More Than 10 Occupants	Serving 10 or Fewer Occupants
Minimum widths	22 in. (55.9 cm) clear between rails	Same
Minimum horizontal dimension of any landing or platform	22 in. (55.9 cm)	Same
Maximum riser height	9 in. (22.9 cm)	Same
Minimum tread, exclusive of nosing	10 in. (25.4 cm)	Same
Tread construction	Solid, $^1/_2$-in. (1.3-cm) diameter. Perforations permitted	Same
Winders	Not permitted	Permitted subject to 3-2.2.2.4
Spiral	Not permitted	Permitted subject to 3-2.2.2.3
Maximum height between landings	12 ft (3.7 m)	Same
Headroom, minimum	6 ft 8 in. (203 cm)	Same
Access to escape *[See 5-3-2.8(d)(1).]*	Door or casement windows 24 in. × 6 ft 6 in. (61 cm × 198 cm) or double-hung windows 30 in. × 36 in. (7 cm × 91 cm) clear opening	Windows providing a clear opening of at least 20 in. (50.8 cm) in width, 24 in. (61 cm) in height, and 5.7 ft^2 (0.53 m^2) in area
Level of access opening	Not over 12 in. (30.5 cm) above floor; steps if higher	Same
Discharge to ground	Swinging stair section permitted if approved by authority having jurisdiction	Same
Capacity, number of persons	0.5 in. (1.3 cm) per person, if access by door; 1 in. (2.5 cm) per person if access by climbing over windowsill	10

(f) *Guards, Handrails, and Visual Enclosures.* All fire escape stairs shall have walls or guards and handrails on both sides in accordance with 3-2.2.4. Existing handrails on existing fire escape stairs shall be permitted to serve as guards and handrails provided the height is not more than 42 in. (107 cm).

(g) *Materials.* Noncombustible materials shall be used for the construction of all components of fire escape stairs.

(h)* *Swinging Stairs.*

1. A single, swinging stair section shall be permitted to serve as the terminus for fire escape stairs over sidewalks, alleys, or driveways, where approved by the authority having jurisdiction.
2. Swinging stair sections shall not be located over doors, over the path of travel from any other exit, or in any locations where there are likely to be obstructions.
3. Width of swinging stair sections shall be at least that of the fire escape stairs above.
4. Pitch of swinging stair sections shall be no steeper than that of the fire escape stairs above.
5. Guards and handrails shall be provided in accordance with 5-3-2.8(f). Guards and handrails shall be designed to minimize the possibility of injury to persons where stairs swing downward. Minimum clearance between moving sections and any other portion of the stair system where hands have the potential to be caught shall be 4 in. (10.2 cm).
6. If the distance from the lowest platform to ground is at least 12 ft (3.7 m), an intermediate balcony not more than 12 ft (3.7 m) from the ground and at least 7 ft (2.1 m) in the clear underneath shall be provided, with width at least that of the stairs and length at least 4 ft (1.2 m).
7. Swinging stairs shall be counterbalanced about a pivot, and cables shall not be used. A weight of 150 lb (68 kg) located one step from the pivot shall not cause the stairs to swing downward, and a weight of 150 lb (68 kg) located one-quarter of the length of the swinging stairs from the pivot shall positively cause the stairs to swing down.
8. The pivot for swinging stairs shall be of a corrosion-resistant assembly or have clearances to prevent sticking due to corrosion.
9.* Devices shall not be installed to lock a swinging stair section in the up position.

(i) *Intervening Spaces.*

1. Where approved by the authority having jurisdiction, fire escape stairs shall be permitted to lead to an adjoining roof that is crossed before continuing downward travel. The direction of travel shall be clearly marked, and walkways with guards and handrails that comply with 3-2.2.4 shall be provided.
2. Where approved by the authority having jurisdiction, fire escape stairs shall be permitted to be used in combination with inside or outside stairs that comply with 3-2.2, provided a continuous path of travel is maintained.

5-3-2.9.2.1 Fire Escape Ladder Construction and Installation. Where approved by the authority having jurisdiction, existing ladders shall be exempt from the provisions of ANSI A14.3, *Safety Code for Fixed Ladders.*

5-3-2.12.2.3 Area of Refuge Minimum Stair Width. Existing exit stairs and landings that provide a minimum 37 in. (94 cm) clear width, measured at and below handrail height, shall be permitted to provide egress from an area of refuge to a public way.

5-3-2.12.3.4 Area of Refuge Minimum Separating Construction. Existing barriers with a minimum $^1/_2$-hour fire resistance rating shall be permitted to separate the area of refuge from the remainder of the story.

5-3-3.4.1 Exception No. 1 Minimum Width of Exit Access Abutted by Furniture and Movable Partitions. The minimum width of an exit access formed by furniture and movable partitions, serving not more than six people, and not more than 50 ft (15 m) in length, shall be at least 18 in. (45.7 cm) at and below a height of 38 in. (96 cm) or 28 in. (71 cm) above a height of 38 in. (96 cm) if the minimum 28-in. (71-cm) width can be provided without moving permanent walls.

5-3-5.1.4 Remoteness of Exit and Exit Access Doors. In existing buildings, exit and exit access doors shall be exempt from the minimum one-half diagonal measurement remoteness rule, provided that such exits or exit access doors are remotely located in accordance with 3-5.1.3.

5-3-10.2.1 Exit Sign Dimensional Criteria. Existing signs that have the required wording in legible letters not less than 4 in. (10.2 cm) high shall be exempt from the dimensional criteria of 3-10.2.1. Existing signs, subject to approval of the authority having jurisdiction, shall be exempt from the dimensional criteria of 3-10.2.1.

5-3-10.2.2 Exit Sign Legibility and Laboratory Listing. Existing signs that have the required wording in legible letters not less than 4 in. (10.2 cm) high shall be exempt from the legibility minimum distance and listing criteria of 3-10.2.2. Existing signs, subject to approval of the authority having jurisdiction, shall be exempt from the legibility minimum distance and listing criteria of 3-10.2.2.

5-3-10.3.3 Internally Illuminated Exit Sign Visibility. Existing signs, subject to the approval of the authority having jurisdiction, shall be exempt from the visibility equivalence criterion of 3-10.3.3.

5-3-10.4.1.2 Exit Sign Directional Indicator. Subject to the approval of the authority having jurisdiction, existing directional exit signs shall be exempt from the criteria of 3-10.4.1.2.

5-3-10.4.2 "NO EXIT" Signs. Existing signs, subject to the approval of the authority having jurisdiction, shall be exempt from the "NO EXIT" sign criteria of 3-10.4.2.

Chapter 6 Referenced Publications

6-1 The following documents or portions thereof are referenced within this code as mandatory requirements and shall be considered part of the requirements of this code. The edition indicated for each referenced mandatory document is the current edition as of the date of the NFPA issuance of this code. Some of these mandatory documents might also be referenced in this code for specific informational purposes and, therefore, are also listed in Appendix B.

6-1.1 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,* 1996 edition.

NFPA 70, *National Electrical Code®*, 1999 edition.

NFPA 99, *Standard for Health Care Facilities,* 1999 edition.

NFPA 110, *Standard for Emergency and Standby Power Systems,* 1999 edition.

NFPA 111, *Standard on Stored Electrical Energy Emergency and Standby Power Systems,* 1996 edition.

NFPA 251, *Standard Methods of Tests of Fire Endurance of Building Construction and Materials,* 1995 edition.

NFPA 252, *Standard Methods of Fire Tests of Door Assemblies,* 1995 edition.

NFPA 257, *Standard on Fire Test for Window and Glass Block Assemblies,* 1996 edition.

6-1.2 Other Publications.

6-1.2.1 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,* 1984.

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

ANSI A1264.1, *Safety Requirements for Workplace Floor and Wall Openings, Stairs and Railing Systems,* 1989.

6-1.2.2 ASME Publication. American Society of Mechanical Engineers, 345 East 47th Street, New York, NY 10017.

ASME/ANSI A17.1, *Safety Code for Elevators and Escalators,* 1996, including ASME A17.1a-1997 and ASME A17.1b-1998.

6-1.2.3 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,* 1983.

6-1.2.4 UL Publication. Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062.

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

Appendix A Explanatory Material

Appendix A is not a part of the requirements of this NFPA document but is included for informational purposes only. This appendix contains explanatory material, numbered to correspond with the applicable text paragraphs.

A-1-2 The purpose of this *Code* is to provide minimum requirements, with due regard to function, for the design and installation of means of egress in buildings and structures for safety to life from fire. Its provisions will also aid life safety in similar emergencies.

The *Code* endeavors to avoid requirements that might involve unreasonable hardships or unnecessary inconvenience or interference with the normal use and occupancy of a building, but provides minimum requirements for means of egress that are consistent with the public interest. The protection methods assume a single fire source.

A-1-2.1 The *Code* recognizes that panic in a burning building might be uncontrollable, but deals with the potential panic hazard through measures designed to prevent the development of panic. Experience indicates that panic seldom develops, even in the presence of potential danger, so long as occupants of buildings are moving toward exits that they can see within a reasonable distance with no obstructions or undue congestion in the path of travel. However, any uncertainty as to the location or adequacy of means of egress, the presence of smoke, or the stoppage of egress travel, such as might occur when one person stumbles and falls on the stairs, might be conducive to panic. Panic danger is greatest when there are large numbers of people in a confined area.

A-1-4.1 Before a particular mathematical fire model or evaluation system is used, its purpose and limitations need to be known. The technical documentation should clearly identify any assumptions included in the evaluation. Also, it is the intent of the Committee on Safety to Life to recognize that future editions of this *Code* are a further refinement of this edition and earlier editions. The changes in future editions will reflect the continuing input of the fire protection/life safety community in its attempt to meet the purpose stated in this *Code*.

A-1-4.2 An equivalent method of protection is one that provides an equal or greater level of safety. It is not a waiver or deletion of a *Code* requirement.

A-1-7.2.3 Ordinary-hazard classification represents the conditions found in most buildings and is the basis for the general requirements of this *Code*.

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

A-1-7.2.4 High-hazard contents might include occupancies where gasoline and other flammable liquids are handled or used or are stored under conditions involving possible release of flammable vapors; where grain dust, wood flour or plastic dust, aluminum or magnesium dust, or other explosive dusts might be produced; where hazardous chemicals or explosives are manufactured, stored, or handled; where cotton or other combustible fibers are processed or handled under conditions producing flammable flyings; and other situations of similar hazard.

A-2-2(d) Access Openings. It is not the intent that these openings be readily openable from the exterior by the public, but that they can easily be opened with normal fire department equipment.

A-2-2 Aisle Accessway. *Aisle accessway* is the name given to the previously unnamed means of egress component leading to an aisle or other means of egress. For example, circulation space between parallel rows of seats that have a width of 1 ft to 2 ft (0.3 m to 0.6 m) and a maximum length of 100 ft (30 m) is an aisle accessway. Some of the circulation space between tables or seats in restaurants might be considered aisle accessway.

A-2-2 Approved. The National Fire Protection Association does not approve, inspect, or certify any installations, procedures, equipment, or materials; nor does it approve or evaluate testing laboratories. In determining the acceptability of installations, procedures, equipment, or materials, the authority having jurisdiction may base acceptance on compliance with NFPA or other appropriate standards. In the absence of such standards, said authority may require evidence of proper installation, procedure, or use. The authority having jurisdiction may also refer to the listings or labeling practices of an organization that is concerned with product evaluations and is

thus in a position to determine compliance with appropriate standards for the current production of listed items.

A-2-2 Area of Refuge. An area of refuge has a temporary use during egress. It generally serves as a staging area that provides relative safety to its occupants while potential emergencies are assessed, decisions are made, and mitigating activities are begun. Taking refuge within such an area is thus a stage of the total egress process — a stage between egress from the immediately threatened area and egress to a public way.

An area of refuge might be another building connected by a bridge or balcony, a compartment of a subdivided story, an elevator lobby, or an enlarged story-level exit stair landing. An area of refuge is accessible by means of horizontal travel or, as a minimum, via an accessible route that meets the requirements of ICC/ANSI A117.1, *American National Standard for Accessible and Usable Buildings and Facilities.*

This *Code* recognizes any floor in a building protected throughout by an approved, supervised automatic sprinkler system as an area of refuge. This is in recognition of the ability of a properly designed and functioning automatic sprinkler system to control a fire at its point of origin and to limit the production of toxic products to a level that is not life threatening.

The requirement for separated rooms or spaces might be met on an otherwise undivided floor by enclosing the elevator lobby with ordinary glass or other simple enclosing partitions that are smoke resisting.

A-2-2 Authority Having Jurisdiction. The phrase "authority having jurisdiction" is used in NFPA documents in a broad manner, since jurisdictions and approval agencies vary, as do their responsibilities. Where public safety is primary, the authority having jurisdiction may be a federal, state, local, or other regional department or individual such as a fire chief; fire marshal; chief of a fire prevention bureau, labor department, or health department; building official; electrical inspector; or others having statutory authority. For insurance purposes, an insurance inspection department, rating bureau, or other insurance company representative may be the authority having jurisdiction. In many circumstances, the property owner or his or her designated agent assumes the role of the authority having jurisdiction; at government installations, the commanding officer or departmental official may be the authority having jurisdiction.

A-2-2 Birth Center. The birth center is a place that provides a low-volume service for healthy, childbearing women, and their families, who are capable of ambulation in the event of fire or fire-threatening events. Birth center mothers and babies have minimal analgesia, no general or regional anesthesia, and are capable of ambulation, even in second stage labor.

A-2-2 Class B Store. Mezzanines are permitted in Class B stores. If more than three floors, excluding mezzanines, are used, the store is Class A, regardless of area.

A-2-2 Common Path of Travel. Common path of travel is measured in the same manner as travel distance, but terminates at that point where two separate and distinct routes become available.

A-2-2 Evacuation Capability. The evacuation capability of the residents and staff is a function of both the ability of the residents to evacuate and the assistance provided by the staff. It is intended that the evacuation capability be determined by the procedure acceptable to the authority having jurisdiction. It is also intended that the timing of drills, the rating of residents, and similar actions related to determining the evacuation capability be performed by persons approved by or acceptable to the authority having jurisdiction. The evacuation capability can be determined by the use of the definitions in Section 2-2, the application of NFPA 101A, *Guide on Alternative Approaches to Life Safety,*Chapter 5, or a program of timed drills.

If drills are used in determining evacuation capability, it is suggested that the facility conduct and record fire drills six times per year on a bimonthly basis, with a minimum of two drills conducted during the night when residents are sleeping. It is also suggested that the facility conduct the drills in consultation with the authority having jurisdiction. Records should indicate the time taken to reach a point of safety, date and time of day, location of simulated fire origin, the escape paths used, and comments relating to residents who resisted or failed to participate in the drills.

Translation of drill times to evacuation capability can be determined as (1) 3 minutes or less, prompt; (2) over 3 minutes, but not in excess of 13 minutes, slow; and (3) more than 13 minutes, impractical.

Evacuation capability in all cases is based on the time of day or night when evacuation of the facility would be most difficult (for example, when residents are sleeping or fewer staff are present).

If the facility management does not furnish an evacuation capability determination that is acceptable to the authority having jurisdiction, the evacuation capability should be classified as impractical. However, an evacuation capability should be considered slow if the following conditions are met:

(a) All residents are able to travel to centralized dining facilities without continuous staff assistance.
(b) There is continuous staffing whenever there are residents in the facility.

A-2-2 Exit. Exits include exterior exit doors, exit passageways, horizontal exits, exit stairs, and exit ramps. In the case of a stairway, the exit includes the stair enclosure, the door to the stair enclosure, stairs and landings inside the enclosure, the door from the stair enclosure to the outside or to the level of exit discharge, and any exit passageway and its associated doors if such are provided so as to discharge the stair directly to the outside. In the case of a door leading directly from the street floor to the street or open air, the exit comprises only the door.

Doors of small individual rooms, as in hotels, while constituting exit access from the room, are not referred to as exits except where they lead directly to the outside of the building.

A-2-2 Floor Area, Gross. Where the term *area* is used, it is understood to be gross area unless otherwise specified.

A-2-2 General Industrial Occupancy. Included are multistory buildings in which floors are occupied by different tenants or buildings suitable for such occupancy and, therefore, are subject to possible use for types of industrial processes with a high density of employee population.

A-2-2 High-Rise Building. It is the intent of this definition that in determining the level from which the highest occupiable floor is to be measured, the enforcing agency should exercise reasonable judgment, including consideration of overall accessibility to the building by fire department personnel and vehicular equipment. If a building is situated on a sloping terrain and there is building access on more than one level, then

the enforcing agency can select the level that provides the most logical and adequate fire department access.

A-2-2 Horizontal Exit. Horizontal exits should not be confused with egress through doors in smoke barriers. Doors in smoke barriers are designed only for temporary protection against smoke, whereas horizontal exits provide protection against serious fire for a relatively long period of time in addition to providing immediate protection from smoke.

A-2-2 Listed. The means for identifying listed equipment may vary for each organization concerned with product evaluation; some organizations do not recognize equipment as listed unless it is also labeled. The authority having jurisdiction should utilize the system employed by the listing organization to identify a listed product.

A-2-2 Means of Egress. A means of egress comprises the vertical and horizontal travel and includes intervening room spaces, doorways, hallways, corridors, passageways, balconies, ramps, stairs, elevators, enclosures, lobbies, escalators, horizontal exits, courts, and yards.

A-2-2 Self-Preservation. Examples of clients who are incapable of self-preservation include infants, clients who are unable to use stairs because of confinement to a wheelchair or other physical disability, and clients who cannot follow directions or go with others to the outside of a facility due to mental or behavioral disorders. It is the intent of this *Code* to classify children under the age of 24 months as incapable of self-preservation. Examples of direct intervention by staff members include carrying a client, pushing a client out in a wheelchair, guiding a client by direct hand-holding or continued bodily contact. If the clients cannot exit the building by themselves with minimal intervention from staff members, such as verbal orders, classification as incapable of self-preservation should be considered.

A-2-2 Smoke Barrier. A smoke barrier might or might not have a fire resistance rating. Such barriers might have protected openings.

A-2-2 Smoke Compartment. In the provision of smoke compartments utilizing the outside walls or the roof of a building, it is not intended that outside walls or roofs, or any openings therein, be capable of resisting the passage of smoke.

A-3-1 Portable ladders, rope fire escapes, and similar emergency escape devices might have a useful function in facilitating escape from burning buildings that lack adequate exits of the stair or other standard type, but they are not the equivalent of standard exits, and their use is not in any way recognized by this *Code* as satisfying the requirements for means of egress. Furthermore, many such devices are of types quite unsuited to use by aged or infirm persons or by small children. Therefore, such devices might give a false sense of security and should not be used as an excuse for not providing standard exit facilities.

A-3-1.1.1 The purpose of a tight-fitting corridor door is to control the flow of smoke. The tight fit can be achieved by close attention to tolerances or by supplemental means. The "crack dimensions" should not exceed the maximum tolerances allowed in NFPA 80, *Standard for Fire Doors, Fire Windows, and Smoke-Control Door Assemblies. (See also NFPA 105, Recommended Practice for the Installation of Smoke-Control Door Assemblies.)*

A-3-1.1.1.2.1 Exception No. 3 A typical nurses' station would normally contain one or more of the following, with associated furniture and furnishings:

(a) Charting area
(b) Clerical area
(c) Nourishment station
(d) Storage of small amounts of medications, medical equipment and supplies, clerical supplies, and linens
(e) Patient monitoring and communication equipment

A-3-1.1.1.2.2 It is this *Code*'s intent that there be no required fire resistance nor area limitations for vision panels in corridor walls and doors.

A-3-1.1.1.2.3 While it is recognized that closed doors serve to maintain tenable conditions in a corridor and adjacent patient rooms, such doors, which under normal or fire conditions are self-closing, might create a special hazard for the personal safety of a room occupant. These closed doors might present a problem of delay in discovery of the fire, confining fire products beyond tenable conditions.

Since it is critical for responding staff members to be able to immediately identify the specific room involved, it is suggested that approved, automatic smoke detection that is interconnected with the building fire alarm be considered for rooms having doors that are equipped with closing devices. Such detection can be located at any approved point within the room. When activated, the detector needs to provide warning that indicates the specific room of involvement by activation of fire alarm annunciator, nurse call system, or any other device acceptable to the authority having jurisdiction.

A-3-1.1.1.2.3.1 Gasketing of doors should not be necessary to achieve resistance to the passage of smoke if the door is relatively tight fitting.

A-3-1.1.2.1(d) Exception Rooms opening onto the exit passageway are intended to include building service elevators, elevator machine rooms, electrical rooms, telephone rooms, janitor closets, restrooms, and other similar normally unoccupied spaces.

A-3-1.1.2.3 This provision prohibits the use of exit enclosures for storage or for installation of equipment not necessary for safety. Occupancy is prohibited other than for egress, refuge, and access. The intent is that the exit enclosure essentially be "sterile" with respect to fire safety hazards.

A-3-1.3.2 Aside from the problems created for persons who are mobility impaired, small changes of elevations in floors are best avoided because of the increased occurrence of missteps where the presence of single steps, a series of steps, or a ramp is not readily apparent. While small changes of elevation pose significant fall risks in the case of individual movement, they are even more undesirable where crowds traverse the area.

A contrasting marking stripe on each stepping surface might be helpful at the nosing or leading edge such that the location of each step is readily apparent, especially when viewed in descent. Such stripes should be at least 1 in. (2.5 cm) but not more than 2 in. (5.0 cm) in width. Other methods could include a relatively higher level of lighting, contrasting colors, contrasting textures, especially prominent handrails, warning signs, a combination thereof, or other similar means. The construction or application of marking stripes should be such that slip resistance is consistent over the walking surface and no tripping hazard is created. *(See also A-3-2.2.3.3.)* Depending on the distractions of the surroundings, the famil-

iarity of users with a particular small change of level, and especially the number of people that might be in a group traversing the change of level (thereby reducing visibility of the level changes), a strong argument can be made for the elimination of steps and ramps that might pose a risk of missteps.

A-3-2.1.1.3 Although 3-2.1.1.3 and 3-2.1.5.1 permit locking of means of egress doors if a building is not considered occupied, this *Code* does not intend to permit occupants to be locked in buildings or building spaces beyond their control except for detention and correctional occupancies and health care occupancies.

A-3-2.1.2.1 Figure A-3-2.1.2.1 illustrates the method of measuring the width of doorways.

In cases where a chapter requires a minimum door width, for example, 36 in. (91 cm), this requirement can be met by a door leaf of the minimum specified width if the term *clear width* does not appear as part of the minimum width requirement. A pair of cross-corridor doors subject to such a requirement would be judged under two sets of criteria:

1. Each door leaf needs to be a minimum of 36 in. (91 cm) in width.
2. The pair of doors needs to provide sufficient, clear, unobstructed width (which will be less than the door leaf width measurement) to handle their assigned occupant load based on a calculation using the appropriate egress capacity factor (as found in 3-3.3.1).

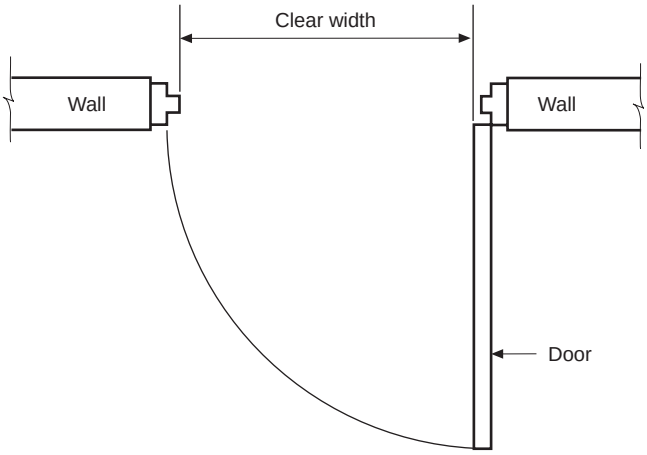


Figure A-3-2.1.2.1 Clear door width.

A-3-2.1.4.1 Where doors are subject to two-way traffic, or where their opening might interfere with pedestrian traffic, an appropriately located vision panel can reduce the chance of accidents.

Swinging doors in horizontal or vertical rolling partitions should be permitted in a means of egress where they comply with the following:

(a) The door or doors comply with 3-2.1.4.
(b) The partition in which the doors are mounted complies with the applicable fire protection rating and closes upon smoke detection or power failure at a speed of not more than 9 in. (23 cm) per second and not less than 6 in. (15 cm) per second.
(c) The doors mounted in the partition are self- or automatic-closing in accordance with 3-2.1.8.

A-3-2.1.4.5 This paragraph is not intended to apply to the swing of cross-corridor doors such as smoke barrier doors and horizontal exits.

A-3-2.1.5.3 It is intended that the reentry provisions apply only to enclosed exit stairs, not to outside stairs. This arrangement makes it possible to leave the stairway at such floor should the fire render the lower part of the stair unusable during egress or should the occupants seek refuge on another floor.

A-3-2.1.5.4 Examples of devices that might be arranged to release latches include knobs, levers, and panic bars. This requirement can be satisfied by the use of conventional types of hardware, whereby the door is released by turning a lever, knob, or handle or by pushing against a panic bar, but not by unfamiliar methods of operation such as a blow to break glass. The operating devices should be capable of being operated with one hand and should not require tight grasping, tight pinching, or twisting of the wrist to operate.

A-3-2.1.5.4 Exception Examples of devices that, when used with a latch, can be arranged to require not more than one additional releasing operation include night latches, dead bolts, and security chains.

A-3-2.1.5.6 Examples of devices prohibited by this requirement include locks, padlocks, hasps, bars, chains, or combinations thereof.

A-3-2.1.6.1(d) The purpose of the audible signal at the door is to ensure those attempting to egress that the system is functional.

A-3-2.1.6.1(e) In the event that the authority having jurisdiction has allowed increased operation time, the sign should reflect the appropriate time.

A-3-2.1.6.3.2 A remote position is generally a control point where a number of doors can be unlocked simultaneously, either mechanically or electrically. In areas where there are a number of sleeping rooms, it is impractical for attendants to unlock doors individually. Doors in an exit should be unlocked prior to unlocking sleeping room doors. Sight and sound supervision of resident living areas can be by camera and communication systems.

This section of the *Code* does not intend to prohibit Use Condition V facilities, nor does it intend to limit Use Condition V facilities to 10 manually released locks.

A-3-2.1.8.1 Examples of doors designed to normally be kept closed include those to a stair enclosure or horizontal exit.

A-3-2.1.9 An example of the type of door addressed by 3-2.1.9 is one that is actuated by a motion-sensing device upon the approach of a person.

A-3-2.1.9 Exception No. 2 Although a single power-operated door leaf located within a two-leaf opening might alone not provide more than 30 in. (76 cm) of clear width in the emergency break-out mode, where both leaves are broken out to become side-hinged, the required egress width can be provided by the width of the entire opening.

A-3-2.2.2.4 If properly designed and constructed, stairs with winders are not necessarily more dangerous than other stairs. Attention to the following factors will help to make winders generally more effective for egress and safety. Handrails should be continuous from story to story, without breaks at newel posts. Indeed, handrails located a greater than normal

distance from the inner turn of winders can improve safety by constraining stair users to walk on the portion of the treads providing deeper treads, with at least 11 in. (27.9 cm) of depth. Combinations of straight flights and winders are best arranged with winders occurring only below the straight flight. This is because the winders provide larger tread dimensions over much of their width than do typical treads on straight flights. A descending person will thus be unlikely to experience a reduction of tread depths during descent, a condition of nonuniformity that is best avoided.

A-3-2.2.3.3 The tripping hazard referred to in 3-2.2.3.3 occurs especially during descent, where the tread walking surface has projections such as strips of high friction materials or lips from metal pan stairs that are not completely filled with concrete or other material. Tread nosings that project over adjacent treads can also be a tripping hazard. ICC/ANSI A117.1, *American National Standard for Accessible and Usable Buildings and Facilities,* illustrates projected nosing configurations that minimize the hazard.

Regarding the slip resistance of treads, it should be recognized that when walking up or down stairs a person's foot exerts a smaller horizontal force against treads than achieved when walking on level floors. Therefore, materials used for floors that are acceptable as slip resistant (as described by ASTM) provide adequate slip resistance where used for stair treads, including the important leading edges of treads, the part of the tread that the foot first contacts during descent, the most critical direction of travel. If stair treads are wet, there might be an increased danger of slipping, just as there might be an increased danger of slipping on wet floors of similar materials. A small wash or drainage slope on exterior stair treads is therefore recommended to shed water *(see The Staircase: Studies of Hazards, Falls, and Safer Design).* Where environmental conditions (such as illumination levels and directionality or a complex visual field drawing a person's attention away from stair treads) lead to a hazardous reduction in one's ability to perceive stair treads, the treads should be made of a material that permits ready discrimination of the number and position of treads. In all cases, the leading edges of all treads should be readily visible during both ascent and descent. A major factor in injury-producing stair accidents and in the ability to use stairs efficiently in conditions such as egress is the clarity of the stair treads as separate stepping surfaces.

A-3-2.2.3.4 A small drainage slope for stair treads subject to wetting can improve tread slip resistance *(see also A-3-2.2.3.3).* A consistent slope to a side of the stair, where drainage is possible, might be preferable to a front-to-back slope of the treads. Providing a pitch of $^1/_8$ in. to $^1/_4$ in. per foot (1 cm to 2 cm per meter) will aid the shedding of water from a nominally horizontal surface.

A-3-2.2.3.5 Figures A-3-2.2.3.5(a), (b), (c), and (d) illustrate the method for measuring riser height and tread depth. Stairs that will be covered with resilient floor coverings might need additional tread depth beyond the minimum specified in the *Code.* Any horizontal projection of resilient covering materials beyond the tread nosing and riser, such as carpet and underlayment, can interfere with users' feet and thereby reduce usable tread depth. At the tread nosing, such resilient covering materials might not be capable of providing stable support for users' feet. Generally, effective tread depth is reduced by the uncompressed thickness of such resilient coverings and might be further reduced over time, if coverings are not well secured, and consequently move forward at the nosings. *[See Figure A-3-2.2.3.5(e).]*

A-3-2.2.4.1 Means of egress components that might require protection with guards include stairs, landings, balconies, corridors, passageways, floor or roof openings, ramps, aisles, porches, and mezzanines.

A-3-2.2.4.2 The intent of this provision is to place handrails for the required egress width of stairs only, regardless of the actual width of the stairs. The required egress width is along the natural path of travel to and from the building. Examples of this requirement are shown in Figure A-3-2.2.4.2. The reduced intermediate handrail spacing of 60 in. (152 cm) along with a handrail height within the permissible height limits permits everyone to reach and grasp one handrail. Except as noted in 3-2.2.4.3 and 3-2.2.4.5, handrails are not required on stair landings.

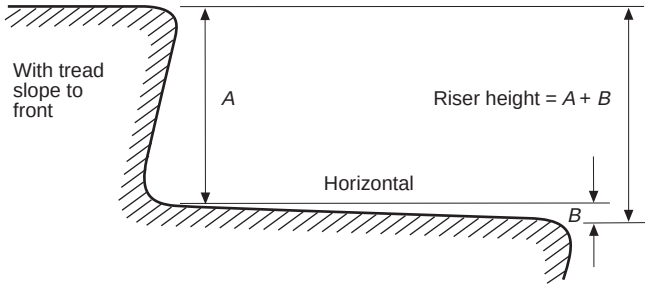


Figure A-3-2.2.3.5(a) Riser measurement with tread slope to front.

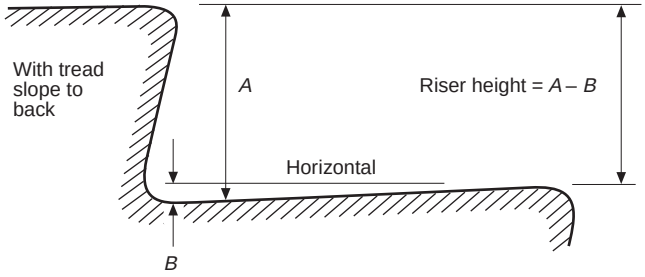


Figure A-3-2.2.3.5(b) Riser measurement with tread slope to back.

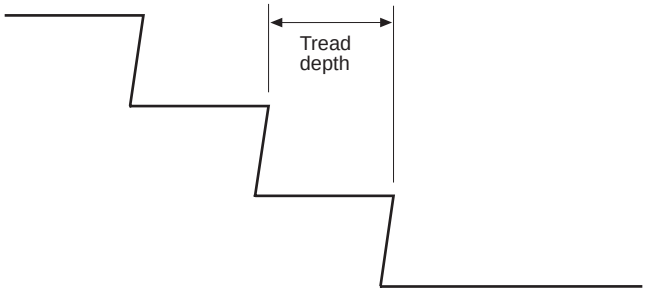


Figure A-3-2.2.3.5(c) Tread depth.

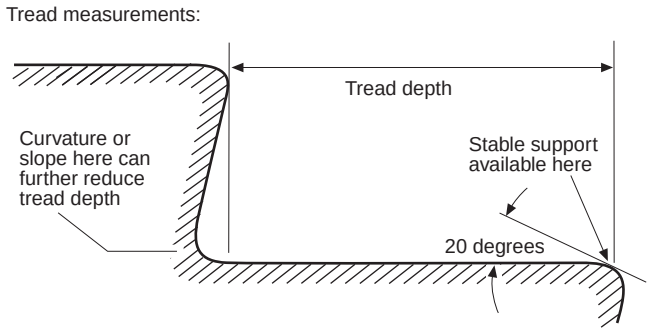


Figure A-3-2.2.3.5(d) Tread measurement with stable support at leading edge

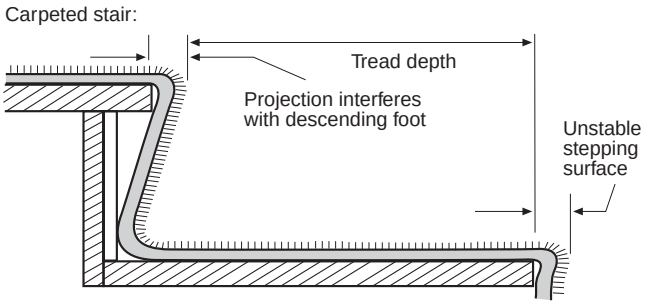


Figure A-3-2.2.3.5(e) Tread measurement with unstable stepping surface at leading edge.

A-3-2.2.4.5 Figure A-3-2.2.4.5 illustrates some of the requirements of 3-2.2.4.5.

A-3-2.2.4.5.1 Exception No. 2 Additional handrails, beyond those required by this *Code*, are permitted at heights other than those stipulated. For example, where children under the age of 5 are major users of a facility, an additional handrail at a height in the range of 28 in. to 32 in. (71 cm to 81 cm) might be useful. Generally, children apparently prefer to use, and can effectively use, handrails that are located at shoulder to head height due to their developmental characteristics and their less developed balance and walking abilities. At 36 months of age, head height ranges from 35 in. to 40 in. (89 cm to 102 cm); shoulder height averages 29 in. (74 cm). At 60 months of age, head height ranges from 39 in. to 46 in. (99 cm to 117 cm); shoulder height ranges from 31 in. to 37 in. (79 cm to 94 cm).

A-3-2.2.4.5.2 This $1^1/_2$-in. (3.8-cm) clearance assumes that the wall and other surfaces adjacent to the handrail are smooth surfaces. Where rough surfaces are used, greater clearances are recommended. In fact, ergonomic studies suggest that $2^1/_4$ in. (5.7 cm) is a more appropriate minimum clearance even to smooth surfaces. Note that the $3^1/_2$-in. (8.9-cm) projection requirement does not prohibit such larger clearances; the $3^1/_2$ in. (8.9 cm) refers to stair width required for egress capacity for example, not the actual width.

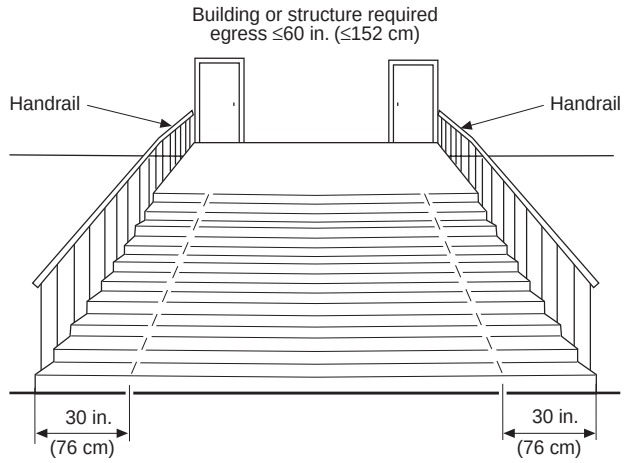
A-3-2.2.4.5.3 Handrails should be designed so they can be grasped firmly with a comfortable grip and so the hand can be slid along the rail without encountering obstructions. The profile of the rail should comfortably match the hand grips. For example, a round profile such as is provided by the simplest round tubing or pipe having an outside diameter of $1^1/_2$ in. to 2 in. (3.8 cm to 5 cm) provides good graspability for adults. Factors such as the use of a handrail by small children and the wall-fixing details should be taken into account in assessing handrail graspability. The most functional as well as the most preferred handrail shape and size is circular with a $1^1/_2$-in. (3.8-cm) outside diameter (according to research conducted using adults). Handrails used predominantly by children should be designed at the lower end of the permitted dimensional range.

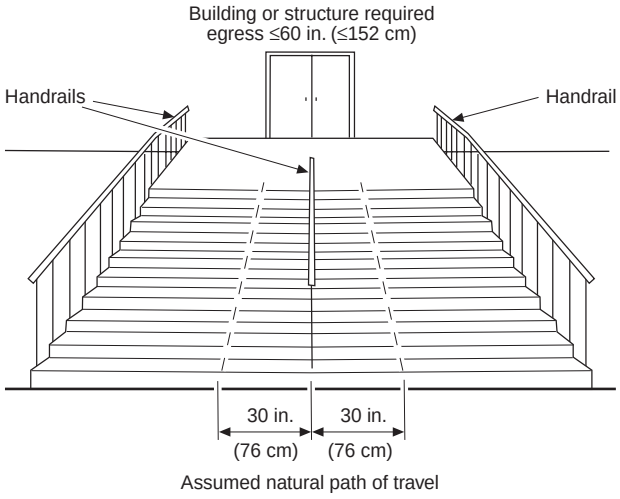
Handrails are one of the most important components of a stair; therefore, design excesses such as oversized wood handrail sections should be avoided unless there is a readily perceived and easily grasped handhold provided. In handrail design, it is useful to remember at all times the effectiveness of a simple round profile that permits some locking action by fingers as they curl around the handrail.

A-3-2.2.4.6.3 Vertical, intermediate rails are preferred to reduce climbability.

A-3-2.2.5.2 The purpose of this provision is to protect the exterior wall of a stairway from fires in other portions of the building. If the exterior wall of the stair is flush with the building exterior wall, the fire would need to travel around 180 degrees in order to impact the stair. This has not been a problem in existing buildings, so no protection is required. However, if the angle of exposure is less than 180 degrees, protection of either the stair wall or building wall is required.

Figures A-3-2.2.5.2(a), (b), and (c) illustrate the requirement (assuming nonrated glass on the exterior wall of the stair is used).





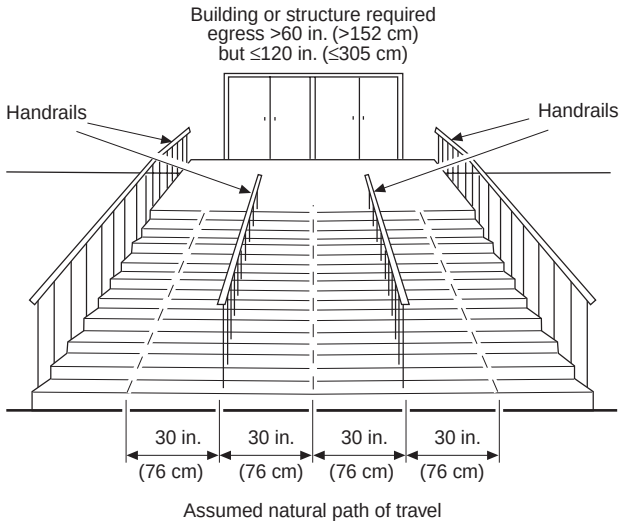


Figure A-3-2.2.4.2 Assumed natural paths of travel on monumental stairs with various handrail locations.

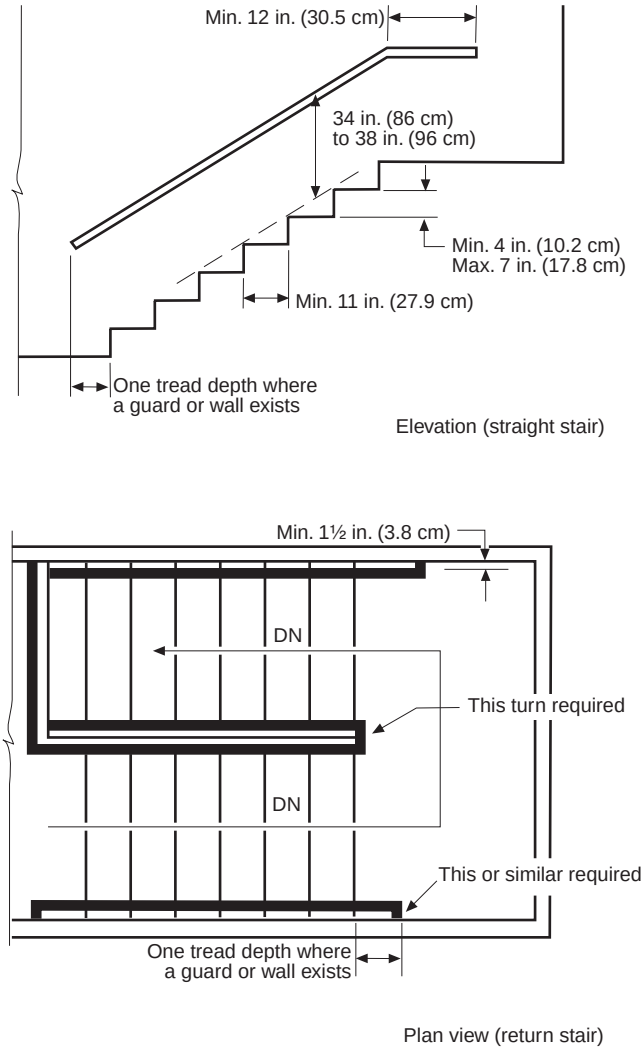


Figure A-3-2.2.4.5 Handrail details.

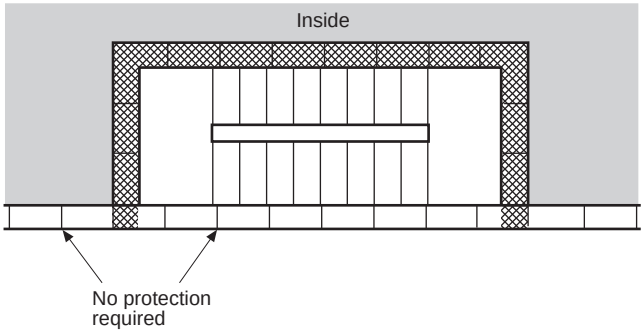


Figure A-3-2.2.5.2(a) Stairway with nonrated exterior wall in same plane as building exterior wall.

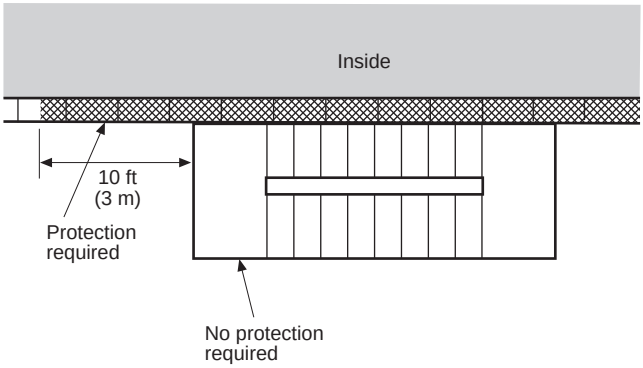


Figure A-3-2.2.5.2(b) Stairway with unprotected exterior perimeter protruding past building exterior wall.

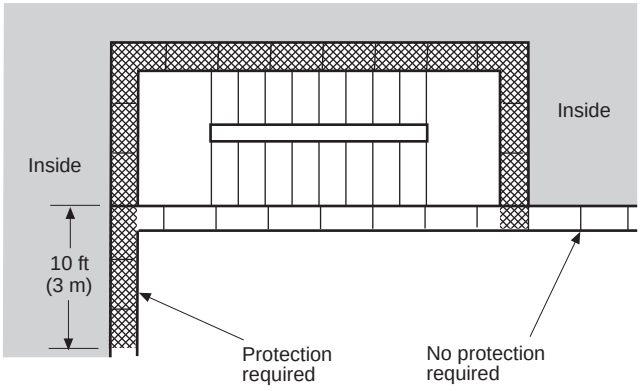


Figure A-3-2.2.5.2(c) Stairway with nonrated exterior wall exposed by adjacent exterior wall of building.

A-3-2.2.5.3 An example of a use with the potential to interfere with egress is storage.

A-3-2.2.5.4 This provision is meant to provide vital egress information to the occupants of a building and to fire fighters. To reduce information overload to occupants during emergency egress, a sign indicating the floor level of and the direction to the exit discharge can be placed as a separate sign with another sign indicating the floor level, the terminus of the top and bottom of the stair enclosure, and the identification of the stair.

A-3-2.2.6.5 See A-3-2.2.3.4.

A-3-2.4.1 *Example*: One way to provide the required egress capacity from the upper floor of a department store building 350 ft × 200 ft (107 m × 60 m) (occupant load 1166 per floor) would be to furnish eight 44-in. (112-cm) stairs. *[See Figure A-3-2.4.1(a).]*

Assume that this building is divided into two sections by a fire barrier that meets the requirements for a horizontal exit, one 130 ft × 200 ft (40 m × 60 m) and the other 220 ft × 200 ft (67 m × 60 m), with two pairs of 46-in. (117-cm) double egress doors, with each door providing 44 in. (112 cm) of clear egress width. *[See Figure A-3-2.4.1(b).]* The smaller section, considered separately, will require the equivalent of three 44-in. (112-cm) exit stairs and the larger section will require five such exits. The horizontal exits will serve as one of the three exits required for the smaller section and two of the five exits required for the larger section. Therefore, only two 44-in. (112-cm) exit stairs from the smaller section and three 44-in. (112-cm) exit stairs from the larger section will be required if the exits can be arranged to meet the requirements for the 150-ft (45-m) travel distance allowed from any point in a nonsprinklered building. Thus, the total number of exit stairs required for the building will be five, as compared with eight if no horizontal exit(s) had been provided.

Another option would be the use of two 56-in. (142-cm) exit stairs from the larger section, which would reduce the total number of stairways required from the floor to four. *[See Figure A-3-2.4.1(c).]* However, if the building were further subdivided by a second fire wall meeting the requirements for a horizontal exit, no further reduction in stairways would be permitted in order to keep from exceeding the requirement that not more than one-half of exiting be via horizontal exits.

A-3-2.4.4.7 For further information, see NFPA 105, *Recommended Practice for the Installation of Smoke-Control Door Assemblies.*

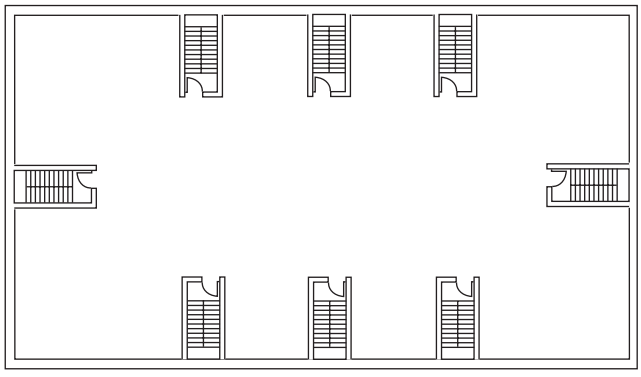


Figure A-3-2.4.1(a) Eight exits, none via horizontal exit, required to provide the necessary egress capacity.

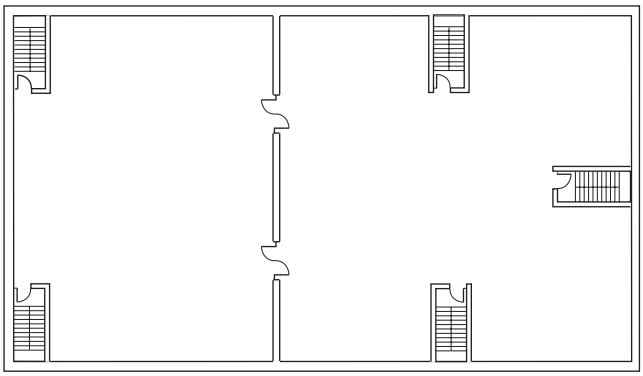


Figure A-3-2.4.1(b) Number of stairs reduced by three through use of two horizontal exits; egress capacity not reduced.

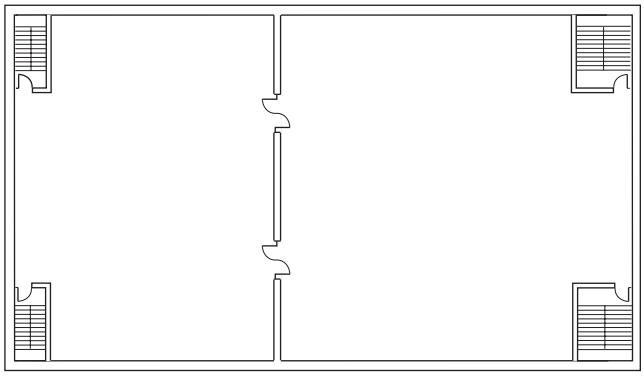


Figure A-3-2.4.1(c) Number of stairs further reduced by widening stairs in larger compartment, but not to less than one-half the required number and capacity of exits from that compartment.

A-3-2.4.4.8 Fusible link-actuated automatic-closing doors do not qualify for use in horizontal exits under these provisions, as smoke might pass through the opening before there is sufficient heat to release the hold-open device.

Such doors are also objectionable because, once closed, they are difficult to open and would inhibit orderly egress.

A-3-2.5.2 The requirement for a minimum 36 in. (91 cm) clear width, measured between projections at or below handrail height, and a greater minimum clear width above, is consistent with the 36 in. (91 cm) width required by ADAAG — Americans with Disabilities Act Accessibility Guidelines. Note that if the handrail diameter exceeds $1^3/_4$ in. (4.4 cm), then the ramp width will need to exceed 44 in. (112 cm) in order to provide both the minimum 36 in. (96 cm) clear width and the minimum $2^1/_4$ in. (5.7 cm) clearance between the handrail and the adjacent wall.

A-3-2.5.6.1 Providing a pitch of $^1/_8$ in. to $^1/_4$ in. per foot (1 cm to 2 cm per meter) will aid the shedding of water from a nominally horizontal surface.

A-3-2.6 An exit passageway serves as a horizontal means of exit travel that is protected from fire in a manner similar to an enclosed interior exit stair. Where it is desired to offset exit stairs in a multistory building, an exit passageway can be used to preserve the continuity of the protected exit by connecting the bottom of one stair to the top of the other stair that continues to the street floor. Probably the most important use of an exit passageway is to satisfy the requirement that at least 50 percent of the exit stairs discharge directly outside from multistory buildings. *(See 3-7.2.)* Thus, if it is impractical to locate the stair on an exterior wall, an exit passageway can be connected to the bottom of the stair to convey the occupants safely to an outside exit door. In buildings of extremely large area, such as shopping malls and some factories, the exit passageway can be used to advantage where the distance of travel to reach an exit would otherwise be excessive.

A-3-2.6.1 Examples of building elements that might be arranged as exit passageways include hallways, corridors, passages, tunnels, underfloor passageways, or overhead passageways.

A-3-2.6.2 Exception No. 1 Where an exit passageway serves occupants on the level of exit discharge as well as other floors, there should be no need to add the occupant loads and thus increase the width of the exit passageway. The situation is the same as having occupants from the level of exit discharge join occupants from upper floors for a few feet of horizontal travel through a stair enclosure.

A-3-2.11 Special consideration should be given prior to the application of such devices where children, the elderly, or physically disabled persons might have to utilize such devices. These devices present obstacles in ascent and descent that differ from stairs and ladders.

A-3-2.12.2.3 The minimum 48 in. (122 cm) clear width is needed for a three-person carry of an occupied wheelchair up or down a stair. This procedure, as well as the more difficult two-person wheelchair carry or roll, requires training and experience. Safer, alternative stair descent measures for transporting a person who normally requires a wheelchair include evacuation chairs and self-braking stair descent devices. In addition to having such devices available where needed, and persons trained and experienced in their use, it is important to have people trained and experienced in wheelchair transfer techniques.

In view of the logistical difficulties as well as the dangers inherent in carrying occupied wheelchairs or otherwise transporting their occupants on stairs, the preferred means of egress from an area of refuge consists of facilities normally employed for ingress and egress by people using wheelchairs. Foremost among these options are elevators that meet the fire fighter service requirements of ASME/ANSI A17.1, *Safety Code for Elevators and Escalators.*

A-3-2.12.2.4 The use of elevators for egress, especially during an emergency such as a fire, is not an approach to be taken without considerable planning, ongoing effort, and a high degree of understanding by everyone involved with the evacuation of persons with mobility impairments. Due in part to the limited capacity of elevators, as well as the conflicting demands for elevator use for fire-fighting activities, even these special elevators cannot be considered as satisfying any of the *Code's* requirements for egress capacity, number of means of egress, or travel distance to an exit.

A-3-2.12.2.6 The instructions should include the following:

(a) Directions to find other means of egress
(b) Advice that persons able to use exit stairs do so as soon as possible unless they are assisting others

(c) Information on planned availability of assistance in the use of stairs or supervised operation of elevators and how to summon such assistance

(d) Directions for use of the emergency communication system

To facilitate an adequate degree of understanding of the use of areas of refuge and of the associated assisted egress procedures, information should be provided to those using the facilities. The exact content of the information, its organization (for example, as a set of instructions), and its format (for example, either posted instructions in the area of refuge or information otherwise transmitted to facility users) should be determined on a case-by-case basis. The information should be tailored to the specific facility, its emergency plan, the intended audience, and the intended presentation format. The following provides suggested information content addressing two situations: an area of refuge that uses an elevator for assisted egress and an area of refuge that uses a stair for assisted egress.

(a) *Refuge with Elevator Use.* The area of refuge, provided in the elevator lobby, serves as a staging area for persons unable to use stairs and in need of assistance for their evacuation during an emergency. The elevator(s) will be taken out of automatic service and operated by emergency service personnel. Persons unable to evacuate down the exit stairs without assistance and who are in need of transportation by elevator should make sure the elevator lobby doors are closed while they wait in the elevator lobby for assistance. The two-way communication system should be used if there is more than several minutes delay in the arrival of an elevator that will provide transportation to the ground floor. Alternatively, the designated exit stair provides another area of refuge where an occupant can receive evacuation assistance.

(b) *Refuge with Stair Use.* The area of refuge within the designated exit stair serves as a staging area for persons in need of assistance for their evacuation during an emergency. Persons unable to use the stair unassisted, or who wish to move down the stairs at a slower pace, should wait on the stair landing. The two-way communication system should be used if assistance is needed.

A-3-2.12.3.1 Figure A-3-2.12.3.1 illustrates the application of the minimum space requirement to an area of refuge located within an exit stair enclosure. Note that each of the two required spaces is sufficient to permit the parking of a standard wheelchair. Preferably, such spaces should be adjacent to each other in a location where the presence of people taking temporary shelter in an area of refuge will be immediately apparent to rescue personnel and other evacuees.

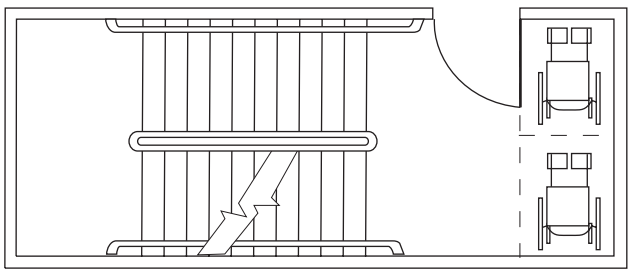


Figure A-3-2.12.3.1 Exit stair used as an area of refuge.

A-3-2.12.3.2 The method of meeting the tenability performance criteria required of an area of refuge less than 1000 ft^2 (93 m^2) in area might involve controlling the exposing fire (for example, via automatic sprinkler protection), installing smoke-resisting doors in the smoke-resisting barriers *(see NFPA 105, Recommended Practice for the Installation of Smoke-Control Door Assemblies)*, providing smoke control to prevent or limit smoke migration through cracks or other leakage paths *(see NFPA 92A, Recommended Practice for Smoke-Control Systems)*, or providing other means or a combination of these means.

Calculations, if used, need to be based on established engineering relationships and equations. Such calculational procedures are described in NFPA 92A, *Recommended Practice for Smoke-Control Systems,* ASHRAE/SFPE's *Design of Smoke Management Systems,* and the *SFPE Handbook of Fire Protection Engineering*. Tenable conditions are those that maintain the temperature of any smoke in the area of refuge at less than 200°F (93°C) if the smoke is more than 5 ft (1.5 m) above the floor, and 120°F (49°C) if the smoke descends below the 5-ft (1.5-m) level in the area of refuge. Also, if the smoke descends below the 5-ft (1.5-m) level, tenable conditions require at least 16 percent oxygen and no more than 30,000 ppm/min exposure to carbon monoxide. The exposing conditions used in the calculations should be in accordance with the following:

(a) Exposing space is sprinkler protected. The temperature of the exposing smoke is 200°F (93°C), the smoke layer extends to the floor, the oxygen content is 16 percent, and the carbon monoxide concentration is 2000 ppm (0.2 percent).

(b) Exposing space is a nonsprinklered corridor finished with Class A interior wall and ceiling finish. The temperature of the exposing smoke is 600°F (315°C), the smoke layer extends to a level 2 ft (0.6 m) above the floor, the oxygen content is 3 percent, and the carbon monoxide concentration is 50,000 ppm (5 percent).

(c) Exposing space is either not a corridor or, if a corridor, the corridor is not finished with a Class A interior wall and ceiling finish. The temperature of the exposing smoke is 1500°F (815°C), the smoke layer extends to a level 2 ft (0.6 m) above the floor, the oxygen content is 3 percent, and the carbon monoxide concentration is 50,000 ppm (5 percent).

A-3-2.12.3.4 Requirements for fire resistance ratings in excess of 1 hour and fire protection ratings in excess of 20 minutes and prohibitions on duct penetrations might appear in other sections of this *Code*. For example, if the barrier creating the area of refuge is also part of an exit stair enclosure that connects more than three stories or is a horizontal exit, a minimum 2-hour fire resistance rating of the barrier and a minimum $1^1/_2$-hour fire protection rating for opening protectives such as doors would be required for most occupancies.

For further information on door openings in smoke-resisting barriers, see NFPA 105, *Recommended Practice for the Installation of Smoke-Control Door Assemblies.*

Generally, by providing one barrier that subdivides a floor area, two areas of refuge can be created. This geometric fact and the possibility of creating areas of refuge within compartmented elevator lobbies or on enlarged stair landings of exit stair enclosures make less onerous any requirement for a story to have more than one accessible means of egress.

A-3-2.13.1 It is the intent of this section that elevators serving as a means of egress serve only independent towers or the tower portion of any integral structure. For elevators that are used as a component in the means of egress, the elevator lob-