# CHAPTER 10

# MEANS OF EGRESS

## 780 CMR 1001.0 GENERAL

**1001.1 Scope**: The provisions of 780 CMR 10 shall control the design, construction and arrangement of building elements required to provide a reasonably safe *means of egress* from all structures.

**1001.2 Modification of egress requirements**: Where strict compliance with the provisions of 780 CMR is not practical, the code official shall approve alternative *means of egress* which will accomplish the same purpose, by the procedure established in 780 CMR 1 for modification of 780 CMR, or by adoption of *approved rules*.

**1001.3 Minimum requirements**: It shall be unlawful to *alter* any building or structure in any manner that will reduce the number of *exits* or the capacity of *exits* below the requirements of 780 CMR for new buildings of the proposed occupancy.

## 780 CMR 1002.0 DEFINITIONS

**1002.1 General**: The following words and terms shall, for the purposes of 780 CMR 10 and as used elsewhere in 780 CMR, have the meanings shown herein.

***Aisle accessway***: That portion of an *exit access* which provides a path of travel to an aisle (see 780 CMR 1012.0).

***Alternating tread stairway***: A stair that has a series of steps between 50° and 70° (0.87 and 1.22 rad) from horizontal, usually attached to a center support rail in an alternating manner so that the user of the stairs never has both feet on the same level at the same time (see 780 CMR 1014.6.6).

***Bleachers***: A *grandstand* where the seats are not provided with backrests (see 780 CMR 1013.0.)

***Common path of travel***: That portion of *exit access* which the occupants are required to traverse before two separate and distinct paths of travel to two *exits* are available. Paths that merge are common paths of travel. A common path of travel is measured the same as travel distance but terminates at that point where two separate and distinct routes become available (see 780 CMR 1011.2.1).

***Corridor***: An enclosed passageway which limits the *means of egress* to a single path of travel (see 780 CMR 1011.0).

***Exit***: That portion of a *means of egress* which is separated from all other spaces of a building or structure by construction and opening protectives as required for exits to provide a protected way of travel to the *exit discharge* (see 780 CMR 1006.0). Exits include exterior exit doors, exit *stairways* (see 780 CMR 1014.0 and 1015.0), exit passageways (see 780 CMR 1020.0) and *horizontal* exits (see 780 CMR 1019.0).

***Exit access***: Exit access is that portion of a *means of egress* which leads to an entrance to an *exit* (see 780 CMR 1011.0).

***Exit discharge***: That portion of a *means of egress* between the termination of an *exit* and a *public way* (see 780 CMR 1006.3).

***Exit discharge, level of***: The horizontal plane located by the point at which an *exit* terminates and an *exit discharge* begins (see 780 CMR 1006.3.1).

***Exit, horizontal***: A way of passage from one building to an area of refuge in another building on approximately the same level, or a way of passage through or around a *wall* or partition to an area of refuge on approximately the same level in the same building, which affords safety from fire or smoke from the area of incidence and areas communicating therewith (see 780 CMR 1019.0).

***Floor area, gross***: Gross floor area shall be the floor area within the perimeter of the outside walls of the building under consideration, without deduction for hallways, stairs, closets, thickness of walls, columns or other features (see 780 CMR 1008.0).

***Floor area, net***: To determine the number of persons for whom *exits* are to be provided, the net floor area shall be the actual occupied area and shall not include unoccupied accessory areas or thickness of walls (see 780 CMR 1008.0).

***Grade hallway, grade lobby, grade passageway***: An enclosed hallway or *corridor* that is an element of an *exit*; and terminates at a street or an open space or *court* communicating with a street (see 780 CMR 1020.0).

***Grandstand***: A structure providing tiered or stepped seating (see 780 CMR 1013.0).

***Means of egress***: A continuous and unobstructed path of travel from any point in a building or

structure to a *public way*. A means of egress consists of three separate and distinct parts: the *exit access*; the *exit*; and the *exit discharge*. A means of egress comprises the vertical and horizontal means of travel and shall include intervening room spaces, doors, hallways, *corridors*, passageways, balconies, ramps, stairs, enclosures, lobbies, *horizontal exits*, *courts* and yards (see 780 CMR 1006.0).

**Occupant load**: The total number of persons that are permitted to occupy a building or portion thereof at any one time (see 780 CMR 1008.0).

***Public way***: Any street, alley or other parcel of land open to the outside air leading to a public street, which has been deeded, dedicated or otherwise permanently appropriated to the public for public use and which has a clear width and height of not less than ten feet (3048 mm).

**Slidescape**: A straight or spiral chute, erected on the interior or exterior of a building, which is designed as a *means of egress* direct to a street or other *public way* (see 780 CMR 1026.0).

***Smokeproof enclosure***: An enclosed *stairway*, with access from the floor *area* of the building either through outside balconies or ventilated vestibules, opening on a street, yard or open *court*; and with a separately enclosed direct *exit* to the street at the grade floor (see 780 CMR 1015.0).

***Stairway***: One or more flights of stairs, and the necessary landings and platforms connecting them, to form a continuous and uninterrupted passage from one floor to another (see 780 CMR 1014.0).

**Winder**: A step in a winding stairway (see 780 CMR 1014.6.3).

## 780 CMR 1003.0 CONSTRUCTION DOCUMENTS

**1003.1 Arrangement of egress**: The *construction documents* shall show in sufficient detail the location, construction, size and character of all *exits*, together with the arrangement of *aisles*, *corridors*, passageways and hallways leading thereto in compliance with the provisions of 780 CMR.

**1003.2 Number of occupants**: In other than occupancies in Use Groups R-2, R-3 and I-1, the *construction documents* and the application for a permit shall designate the number of occupants to be accommodated on every floor, and in all rooms and spaces as required by the code official. Unless otherwise specified, the minimum number of occupants to be accommodated by the *exits* shall be determined by the occupant load prescribed in 780 CMR 1008.0. The posted occupant load of the building shall be limited to that number. The fire prevention code official shall be informed in *writing* of the calculated occupant load.

**1003.3 Posted occupant load**: Every assembly room or space in an assembly occupancy shall have the approved occupant load of the room or space posted in a conspicuous place, near the main entrance to the room or space. Rooms or spaces which have multiple-use capabilities shall be posted for all such occupancies. All posted signs shall be of an approved legible permanent design.

## 780 CMR 1004.0 USE GROUP AND OCCUPANCY REQUIREMENTS

**1004.1 New buildings**: Every building and structure, and part thereof, hereafter erected shall have the prescribed number of *exits* of one or more of the approved types defined in 780 CMR 10. *Exits*, in combination with the *exit access* and *exit discharge*, shall provide safe and continuous *means of egress* to a street or to an open space with direct access to a street.

**1004.2 *Hazardous Means of Egress***:

**1004.2.1 Exit Order/Hazardous *Means of Egress***: In any *existing building* or structure not provided with exit facilities as herein prescribed for new buildings and in which the exits are deemed hazardous or dangerous to life and limb, the *building official* shall declare such building dangerous and unsafe in accordance with the provisions of 780 CMR 121.0.

**1004.2.2 Appeal from exit order**: Any person served with any order pursuant to 780 CMR 3400.5 shall have the remedy prescribed in 780 CMR 121.

**1004.3 Multiple occupancies**: Where a building is occupied by two or more occupancies, the *means of egress* requirements shall apply to each portion of the building based on the occupancy of space.

**1004.4 Multiple tenants**: Where more than one tenant occupies any one floor of a building or structure, each tenant shall be provided with direct access to approved *exits*.

## 780 CMR 1005.0 GENERAL LIMITATIONS

**1005.1 Exits**: An *exit* shall not be utilized for any purpose that interferes with its function as a *means of egress*.

**1005.2 Floor openings**: Manholes or floor access panels which reduce the clearance to less than 32

inches (813 mm) shall not be located in the line of *means of egress*.

**1005.3 Protruding objects**: A minimum headroom of 80 inches (2032 mm) shall be provided for any walking surface, including walks, halls, *corridors*, aisles and passageways. Structural elements, fixtures or furnishings shall not project from either side more than four inches (102 mm) over any walking surface between the heights of 27 (686 mm) and 80 inches (2032 mm) above the walking surface. A free-standing object mounted on a post(s) or pylon(s) shall not overhang that post(s) or pylon(s) more than 12 inches (305 mm) where the lowest point of the leading edge is more than 27 inches (686 mm) and less than 80 inches (2032 mm) above the walking surface. Door closers and stops shall not reduce headroom to less than 78 inches (1981 mm).

**1005.4 Floor surface**: All floors of *corridors* and lines of *means of egress* shall have a slip-resistant surface.

**1005.5 Open-sided floor areas**: Guards shall be located along open-sided walking surfaces, *mezzanines* and landings which are located more than 30 inches (762 mm) above the floor or grade below. The guards shall be constructed in accordance with 780 CMR 1021.0.

**Exception**: Guards are not required on the loading side of loading docks and the auditorium side of *stages* and raised platforms.

**1005.6 Elevation change**: Where changes in elevation exist in *exit access corridors*, *exits* or *exit discharge*, ramps shall be used where the difference in elevation is less than 12 inches (305 mm).

**Exception**: A maximum step height of eight inches (203 mm) shall be permitted for buildings with occupancies in Use Groups F, H, R and S at exterior doors not required to be accessible by ***521 CMR, the Rules and Regulations of the Architectural Access Board, referenced in 780 CMR 11, and listed in Appendix A.***

**1005.7 Egress elements for air movement**: *Exits* and *exit access corridors* shall not be used as supply or return air ducts or plenums.

**Exceptions**:

1. The restriction on the use of the space between the *corridor* ceiling and the floor or roof structure above as a return air plenum shall not apply where the *corridor* is not required to be of fireresistance rated construction or is separated from the plenum by fireresistance rated construction or is located within a *dwelling unit*.
2. This restriction shall not apply to *exit access corridors* located within tenant spaces that are 1,000 square feet (92 $m^2$ ) or less in area.

## 780 CMR 1006.0 TYPES AND LOCATION OF MEANS OF EGRESS

**1006.1 General**: All approved *means of egress*, including doorways, passageways, *corridors*, interior *stairways*, exterior *stairways*, *smokeproof enclosures*, ramps, *horizontal exits*, bridges, balconies, fire escapes and combinations thereof, shall be arranged and constructed as provided for in 780 CMR.

**1006.2 Arrangement**: All required *exits* shall be so located as to be discernable with unobstructed access thereto.

**1006.2.1 Egress through adjoining spaces**: Egress from a room or space shall not open into an adjoining or intervening room or area, except where such adjoining room or area is accessory to the area served, is not a high-hazard occupancy and provides a direct *means of egress* to an *exit*. A maximum of one *exit access* shall be permitted to pass through a kitchen, storeroom, restroom, closet or similar space provided that passage through such space is not the only means of access to an *exit*. An *exit access* shall not pass through a room subject to locking. *Means of egress* from *dwelling units*, rooming units, guestrooms and *dormitory* units shall not lead through other such units, or through toilet rooms or bathrooms.

**1006.2.2 Assembly buildings**: All buildings occupied for assembly purposes shall front on at least one street on which the main entrance and *exit discharge* shall be located. Where there is a single main entrance, the entrance shall be capable of serving as the main *exit* and shall provide an egress capacity for at least one-half of the total occupant load. In addition to having access to a main *exit*, each level of an occupancy in Use Group A shall be provided with additional *exits* which shall provide a *means of egress* capacity for at least one-half of the total occupant load served by that level.

**1006.2.2.1 Assembly A-2 minimum main entrance/exit door size**: The main entrance/ exit door shall be a minimum 72 inches (nominal) width. This main entrance/ exit door shall consist of a pair of side-hinged swinging type doors without a center mullion and shall be equipped with panic hardware – also see 780 CMR 1011.3.

**1006.2.3 Skating rinks**: Places of assembly used for skating rinks shall not be located below the floor nearest grade.

**1006.2.4 Foyers and waiting spaces**: The term "foyer" shall mean an enclosed space surrounding, or in the rear of, the auditorium of a theater or other place of assembly which is completely separated from the auditorium and is used as an assembly or waiting space for the occupants. In Use Group A-1, a foyer, waiting space or lobby shall be provided with a *net floor area*, exclusive of stairs or landings, of not less than 1½ square feet (0.14 $m^2$) for each occupant having access thereto. The use of foyers and lobbies and other available spaces for harboring occupants until seats become available shall not encroach upon the clear floor area herein prescribed or upon the required clear width of front *exits*.

**1006.2.4.1 Egress**: Where the foyer is not directly connected to the public street through the main lobby, an unobstructed *corridor* or passage shall be provided which leads to, and equals the required minimum width of, main entrances and *exits*. A mirror shall not be placed so as to give the appearance of a doorway, *exit* or passageway.

**1006.2.4.2 Gradient**: The rear foyer shall be at the same level as the back of the auditorium and the *means of egress* leading therefrom shall not have a steeper gradient than one unit vertical in eight units horizontal (1:8).

**1006.2.4.3 Construction**: In occupancies in Use Group A-1, other than motion picture theaters, the *fire separation assemblies* separating the foyer from the auditorium and other adjoining rooms and spaces shall be constructed with not less than a two-hour fire-resistance rating. Where opening protectives are constructed of noncombustible materials, a fireresistance rating of the opening protectives is not required.

**1006.3 Exit Discharge**: All *exits* shall discharge directly at a *public way* or at a yard, *court* or open space of the required width and size to provide all occupants with a safe access to a *public way*.

**1006.3.1 Level of exit discharge protection**: In all buildings having habitable or occupiable stories or *basements* below grade, the floor/ceiling assemblies and supports which are constructed below the *level of exit discharge* shall provide a fireresistance rating of not less than one hour.

**Exceptions**:
1. Occupancies in Use Group R-3.
2. Buildings of Type 1 construction.
3. Where floor/ceiling assemblies and supports are constructed of Type 4 construction.
4. Where the floor areas below the *level of exit discharge* are equipped throughout with an *automatic sprinkler system* in accordance with 780 CMR 906.2.1 or 906.2.2.
5. Occupiable stories or *basements* below grade which have *exits* that discharge directly to grade.

**1006.4 Remote location**: Wherever more than one *exit* is required from any room, space or floor of a building, such *exits* shall be placed as remote from each other as practicable, and shall be arranged and constructed to provide direct access in separate directions from any point in the area served so as to minimize the possibility that both *exits* will be blocked by any one fire or other emergency condition.

**1006.4.1 Remoteness**: Where two *exits* or two *exit access* doors are required, each shall be placed a distance apart equal to not less than one-half of the length of the maximum overall diagonal dimension of the building or area to be served. Where *exit* enclosures are provided as a portion of the required *means of egress* and are interconnected by a *corridor* conforming to the requirements for *corridor* construction, the exit separation distance shall be measured along the line of travel within the *corridor*. In all other cases, the separation distance shall be measured in a straight line between *exits* or *exit access* doors.

**Exception**: In buildings equipped throughout with an *automatic sprinkler system* in accordance with 780 CMR 906.2.1 or 906.2.2, the minimum separation distance shall be ¼ of the length of the maximum overall diagonal dimension.

**1006.4.1.1 Three or more**: Where three or more *exits* or *exit access* doors are required, at least two *exits* or *exit access* doors shall be separated as provided for in 780 CMR 1006.4.1.

**1006.5 Length of travel**: All *exits* shall be so located that the maximum length of *exit access* travel, measured from the most remote point to an approved *exit* along the natural and unobstructed line of travel, shall not exceed the distances given in Table 1006.5.

**Table 1006.5**
**LENGTH OF EXIT ACCESS TRAVEL[a]**

| Use Group | Without sprinkler system (feet)[c] | With sprinkler system[b] (feet)[c] |
|---|---|---|
| A, B, E, F-1, I-1, M, R, S-1 | 200 | 250 |
| F-2, S-2 | 300 | 400 |
| H-1 | 25 | 75 |
| H-2 | 50 | 100 |
| H-3 | 100 | 150 |
| H-4 | 125 | 175 |
| I-2, I-3 | 150 | 200 |

**Note a**. See the following sections for modification to travel distance requirements.

780 CMR 402.5.1: For the exit access travel distance in malls.

780 CMR 404.7: For the exit access travel distance limitation through an atrium space.

780 CMR 416.6: For the exit access travel distance limitation in HPM use facilities.

780 CMR 1006.5.1: For increased limitation in Use Groups F-1 and S-1.

780 CMR 1006.5.2: For increased limitation in Use Group A-5.
780 CMR 1010.3: For buildings with one exit.
780 CMR 3104.9: For the exit access travel distance limitation in temporary structures.

**Note b**. Buildings equipped throughout with an automatic sprinkler system in accordance with 780 CMR 906.2.1 or 906.2.2.

**Note c**. 1 foot = 304.8 mm.

NON-TEXT PAGE

**1006.5.1 Roof vent increase**: In buildings which are one story in *height*, equipped with automatic heat and smoke roof vents complying with 780 CMR 922.0 and equipped throughout with an *automatic sprinkler system* in accordance with 780 CMR 906.2.1, the *exit access* travel distance limitation in Table 1006.5 for occupancies in Use Group F-1 or S-1 shall be increased to 400 feet (122 m).

**1006.5.2 Use Group A-5**: Occupancies in Use Group A-5, where all portions of the *means of egress* are essentially open to the outside, shall have an *exit access* travel distance of not more than 400 feet (122 m), except that such occupancies in buildings and structures of Type 1 or 2 construction shall not have an *exit access* travel distance limitation.

**1006.6 Elevators, escalators and moving walks**: Elevators, *escalators* and *moving walks* shall not be accepted as a required element of the *means of egress*.

**Exception**: An elevator conforming to 780 CMR 1007.3 shall be permitted for an accessible *means of egress*.

**1006.7 Common path of travel**: The *common path of exit access travel* distance for occupants to reach a point where two separate and distinct paths of travel are available to two *exits* shall not exceed l00 feet (30480 mm) in occupancies in Use Group I-3.

## 780 CMR 1007.0 ACCESSIBLE MEANS OF EGRESS

**1007.1 General**: All spaces required to be accessible by ***521 CMR, the Rules and Regulations of the Architectural Access Board, referenced in 780 CMR 11, and listed in Appendix A*** shall be provided with not less than one accessible *means of egress* that complies with 780 CMR 1007.0. Where more than one *means of egress* is required from any required accessible space, each accessible portion of the space shall be served by not less than two accessible *means of egress*. Each accessible *means of egress* shall provide a continuous path of travel from a required accessible space to a *public way* which is usable by a mobility impaired person and shall include accessible routes, ramps, *exit stairways*, elevators, *horizontal exits* or smoke barriers.

**1007.2 Exit stairways**: An *exit stairway* to be considered part of an accessible *means of egress* shall have a clear width of at least 48 inches (1219 mm) between handrails and shall either incorporate an area of refuge within an enlarged story-level landing or shall be accessed from an area of refuge complying with 780 CMR 1007.5 or a *horizontal exit*.

**Exceptions**:

1. Stairs serving a single *dwelling unit* or guestroom.
2. Occupancies equipped throughout with an *automatic sprinkler system* in accordance with 780 CMR 906.2.1.
3. The clear width of 48 inches (1219 mm) between handrails is not required for *exit stairways* accessed from a *horizontal exit*.

**1007.3 Elevators**: An elevator, to be considered part of an accessible *means of egress*, shall comply with 524 CMR and standby power shall be provided in accordance with 527 CMR 12.00 as listed in ***Appendix A***. The elevator shall be accessed from an area of refuge complying with 780 CMR 1007.5 or a *horizontal exit*. In buildings where a required accessible floor is four or more stories above or below a *level of exit discharge* serving that floor, at least one elevator shall be provided and shall serve as one required accessible *means of egress*.

**Exceptions**:

1. In buildings equipped throughout with an *automatic sprinkler system* in accordance with 780 CMR 906.2.1, the elevator shall not be required to serve floors which are located at or above the *level of exit discharge* and provided with a *horizontal exit* complying with 780 CMR 1019.0.
2. Elevators are not required to be accessed from an area of refuge or a *horizontal exit* in occupancies equipped throughout with an *automatic sprinkler system* in accordance with 780 CMR 906.2.1.

**1007.4 Platform lifts**: Platform (wheelchair) lifts shall not serve as part of an accessible *means of egress* except within a *dwelling unit*.

**1007.5 Areas of refuge**: Every required area of refuge shall be accessible from the space it serves by an accessible *means of egress*. The maximum travel distance from any accessible space to an area of refuge shall not exceed the travel distance permitted for the occupancy in accordance with 780 CMR 1006.5. Every required area of refuge shall have direct access to an *exit stairway* complying with 780 CMR 1007.2 or an elevator complying with 780 CMR 1007.3. Where an elevator lobby is used as an area of refuge, the *shaft* and lobby shall comply with 780 CMR 1015.0 for *smokeproof enclosures* except where the elevators are in an area of refuge formed by a *horizontal exit* or smoke barrier.

**Exception**: Areas of refuge are not required in open parking structures

**1007.5.1 Size**: Each area of refuge shall be sized to accommodate one wheelchair space of 30 inches (762 mm) by 48 inches (1219 mm) for each 200 occupants or portion thereof, based on the occupant load of the area of refuge and all

areas served by the area of refuge. Such wheelchair spaces shall not reduce the required *means of egress* width. Access to any of the required wheelchair spaces in an area of refuge shall not be obstructed by more than one adjoining wheelchair space.

**1007.5.2 Separation**: Each area of refuge shall be separated from the remainder of the story by a smoke barrier complying with 780 CMR 712.0. Each area of refuge shall be designed to prevent the intrusion of smoke, except those areas of refuge located within a *stairway* enclosure or those areas of refuge where the area of refuge and all areas served by the area of refuge are equipped throughout with an *automatic sprinkler system* in accordance with 780 CMR 906.2.1.

**1007.5.3 Communication system**: Every area of refuge in buildings more than four stories in height shall be provided with a two-way emergency communication system between the area of refuge and a central control point.

In each area of refuge provided with a two-way emergency communication system, instructions on the use of the area under emergency conditions shall be posted adjoining the communication system. The instructions shall include:

1. Directions to other *means of egress*;
2. Advice that persons able to use the *exit* stairs do so as soon as possible unless they are assisting others;
3. Information on how to summon planned availability of assistance in the use of stairs or supervised operation of elevators; and
4. Directions for use of the two-way emergency communication system.

**1007.5.4 Identification**: Each door providing access to an area of refuge from an adjacent floor area shall be identified by a sign complying with 521 CMR and CABO A117.4 listed in ***Appendix A*** stating "Area of Refuge" and the International Symbol of Accessibility. The sign shall be illuminated as required for "Exit" signs where "Exit" sign illumination is required. Additionally, tactile signage complying with 521 CMR listed in ***Appendix A*** shall be located at each door to an area of refuge.

**1007.6 Signage**: Signage indicating the location of accessible *means of egress* shall be installed at all *exits* and elevators that serve a required accessible space, but which are not an approved accessible *means of egress*.

## 780 CMR 1008.0 OCCUPANT LOAD

**1008.1 Design occupant load**: In determining required facilities, the number of occupants for whom *exit* facilities shall be provided shall be established by the largest number computed in accordance with 780 CMR 1008.1.1 through 1008.1.3.

**1008.1.1 Actual number**: The actual number of occupants for whom each occupied space, floor or building is designed.

**1008.1.2 Number by Table 1008.1.2**: The number of occupants computed at the rate of one occupant per unit of area as prescribed in Table 1008.1.2.

**1008.1.3 Number by combination**: The number of occupants of any space as computed in 780 CMR 1008.1.1 or 1008.1.2 plus the number of occupants similarly computed for all spaces that discharge through the space in order to gain access to an *exit*.

**1008.1.4 Increased occupant load**: The occupant load permitted in any building or portion thereof is permitted to be increased from that number established for the occupancies in Table 1008.1.2 provided that all other requirements of 780 CMR are also met based on such modified number. Where required by the code official, an approved aisle, seating or fixed equipment diagram to substantiate any increase in occupant load shall be submitted. Where required by the code official, such diagram shall be *posted*.

**Table 1008.1.2**
**MAXIMUM FLOOR AREA ALLOWANCES PER OCCUPANT**

| Occupancy | Floor area[a] in square feet per occupant |
|---|---|
| Assembly with fixed seats | See780 CMR 1008.1.6 |
| Assembly without fixed seats | |
| Concentrated (chairs only - not fixed) | 7 net |
| Standing space | 3 net |
| Unconcentrated (tables and chairs) | 15 net |
| Bowling centers, allow 5 persons for each lane including 15 feet of runway, and for additional areas | 7 net |
| Business areas | 100 gross |
| Courtrooms - other than fixed seating areas | 40 net |
| Educational | |
| Classroom area | 20 net |
| Shops and other vocational room areas | 50 net |
| Industrial areas | 100 gross |
| Institutional areas | |
| Inpatient treatment areas | 240 gross |
| Outpatient areas | 100 gross |
| Sleeping areas | 120 gross |
| Library | |
| Reading rooms | 50 net |
| Stack area | 100 gross |

| | |
|---|---|
| Mercantile, basement and grade floor areas | 30 gross |
| Areas on other floors | 60 gross |
| Storage stock, shipping areas | 300 gross |

| Occupancy | Floor area[a] in square feet per occupant |
|---|---|
| Parking garages | 200 gross |
| Residential | 200 gross |
| Storage areas, mechanical equipment room | 300 gross |

**Note a**. 1 foot = 304.8 mm; 1 square foot = 0.093 $m^2$

**1008.1.5 Maximum occupant load**: The occupant load of any space or portion thereof shall not exceed one occupant per three square feet (0.28 $m^2$) of occupiable floor space.

**1008.1.6 Fixed seats**: The occupant load for an assembly or educational area having fixed seats shall be determined by the number of fixed seats installed. The capacity of fixed seats without dividing arms shall equal one person per 18 inches (457 mm). For booths, the capacity shall be one person per 24 inches (610 mm).

**1008.2 Mezzanine levels**: The occupant load of a *mezzanine* level discharging through a floor below shall be added to that floor's occupant load, and the capacity of the *exits* shall be designed for the total occupant load thus established.

**1008.3 Roofs**: Roof areas occupied as roof gardens or for assembly, educational, storage or other purposes, shall be provided with *exit* facilities to accommodate the required occupant load, but there shall not be less than two approved *means of egress* from roof areas of Use Groups A and E.

## 780 CMR 1009.0 CAPACITY OF EGRESS COMPONENTS

**1009.1 General**: The capacity of *means of egress* for a floor, balcony, tier or other occupied space shall be sufficient for the occupant load thereof.

**1009.2 Minimum width**: The width of each *means of egress* component shall not be less than the width computed in accordance with Table 1009.2 for the required capacity of the component, but not less than the minimum width as prescribed by 780 CMR for each such component.

**Table 1009.2**
**EGRESS WIDTH PER OCCUPANT**

| | Without sprinkler system (inches per person)[b] | | With sprinkler system[a] (inches per person)[b] | |
|---|---|---|---|---|
| Use group | Stairways | Doors ramps and corridors | Stairways | Doors ramps and corridors |
| A, B, E, F, M, R, S | 0.3 | 0.2 | 0.2 | 0.15 |
| H | 0.7 | 0.4 | 0.3 | 0.2 |
| I-1 | 0.4 | 0.2 | 0.2 | 0.2 |
| I-2 | 1.0 | 0.7 | 0.3 | 0.2 |
| I-3 | 0.3 | 0.2 | 0.3 | 0.2 |

**Note a**. Buildings equipped throughout with an automatic sprinkler system in accordance with 780 CMR 906.2.1 or 906.2.2.

**Note b**. 1 inch = 25.4 mm.

**1009.3 Exit design per floor**: Where *exits* serve more than one floor, only the occupant load of each floor considered individually shall be used in computing the required capacity of the *exits* at that floor, provided that the *exit* capacity shall not decrease in the direction of *means of egress* travel.

**1009.4 Egress convergence**: Where *means of egress* from floors above and below converge at an intermediate floor, the capacity of the *means of egress* from the point of convergence shall not be less than the sum of the two.

## 780 CMR 1010.0 NUMBER OF EXITS

**1010.1 General**: The general requirements of 780 CMR 1010.0 apply to buildings of all use groups. Where more restrictive requirements are provided in 780 CMR, such requirements shall take precedence over the general provisions of 780 CMR 1010.0.

**1010.2 Minimum number**: Every floor area shall be provided with the minimum number of approved independent *exits* as required by Table 1010.2 based on the occupant load, except as modified in 780 CMR 1010.3.

**Exception**: In buildings with occupancies in Use Group R having multistory *dwelling units*, the *means of egress* from a *dwelling unit* to the required *exits* is permitted to be provided from one level only. Within the *dwelling unit* access to the *means of egress* from the unit shall conform to the applicable provisions of 780 CMR 10.

**Table 1010.2**
**MINIMUM NUMBER OF EXITS FOR OCCUPANT LOAD**

| Occupant load | Minimum number of exits |
|---|---|
| 500 or less | 2 |
| 501 - 1,000 | 3 |
| over 1,000 | 4 |

**1010.3 Buildings with one exit**: Only one *exit* shall be required in:

1. Occupancies in the use groups shown in Table 1010.3, provided that the building has not more than one level below the *level of exit discharge*.

**Table 1010.3**
**BUILDINGS WITH ONE EXIT**

| Use Group | Maximum height above grade | Max. Size | Max. Exit access travel distance | Minimum fire-resistance rating of exit enclosure | Min. Fire-resistance rating of opening protection |
|---|---|---|---|---|---|
| B[b]<br>S-2[a] | 2 stories | 3,500 sq. ft. per floor | 75 ft. | 1 hour | 1 hour |

**Note a**. For the required number of exits for open parking structures, see 780 CMR 1010.5.

**Note b**. For the required number of exits for air traffic control towers, see 780 CMR 414.0.

**Note c**. 1 foot = 304.8 mm.

**1010.4 Emergency escape**: Every sleeping room below the fourth story in occupancies in Use Groups R and I-1 shall have at least one operable window or exterior door approved for emergency egress or rescue. The units shall be operable from the inside without the use of special knowledge, separate tools or force greater than that which is required for normal operation of the window. Where windows are provided as a *means of egress* or rescue, the windows shall have the bottom of the clear opening not more than 44 inches (1118 mm) above the floor. All egress or rescue windows from sleeping rooms shall have a minimum net clear opening of 5.7 square feet (0.53 $m^2$). The minimum net clear opening height dimension shall be 24 inches (610 mm). The minimum net clear opening width dimension shall be 20 inches (508 mm).

Bars, grilles or screens placed over emergency escape windows shall be releasable or removable from the inside without the use of a key, tool or force greater than that which is required for normal operation of the window.

**Exceptions**:

1. The minimum net clear opening for grade floor windows shall be five square feet (0.47 $m^2$).
2. An outside window or an exterior door for emergency escape is not required in buildings where the sleeping room is provided with a door to a *corridor* having access to two remote *exits* in opposite directions.
3. An outside window or an exterior door for emergency escape is not required in buildings equipped throughout with an *automatic sprinkler system* in accordance with 780 CMR 906.2.1 or 906 2.2

**1010.5 Open parking structures**: Parking structures shall not have less than two *exits* from each parking tier, except that only one *exit* is required where vehicles are mechanically parked. Unenclosed vehicle ramps shall not be considered as required *exits* unless pedestrian facilities are provided. Interior *exit stairways* are not required to be enclosed.

## 780 CMR 1011.0 EXIT ACCESS PASSAGEWAYS AND CORRIDORS

**1011.1 Access passageway**: Direct *exit access* shall be provided to required *exits* through continuous passageways, *aisle accessways*, aisles or *corridors* which are conveniently available to all occupants and maintained free of obstruction. In every area containing seating, displays, exhibits, counters, shelving and other furnishings or fixtures, a path of travel that connects with each of the *means of egress* doorways serving the area and which complies with the minimum width requirements of aisles, shall be provided.

**1011.1.1 Use Groups I-2 and I-3**: Every sleeping room in occupancies in Use Group I-2 or I-3 shall have an *exit access* door leading directly to an *exit access* corridor.

**Exception**: Direct *corridor* access is not required:

1. Where there is an *exit* door opening directly to the outside from the room at ground level.
2. In occupancies in Use Group I-2, where one adjacent room, such as a sitting room or anteroom, intervenes and all doors along the *means of egress* are equipped with nonlockable hardware in accordance with 780 CMR 409.3.2, and the intervening room is not used as an *exit access* for more than eight patients.
3. In occupancies in Use Group I-2, where a patient sleeping room is subdivided with nonfireresistance rated, noncombustible partitions, provided that the arrangement allows for direct and constant visual supervision by nursing personnel and the suite complies with 780 CMR 1011.1 and 780 CMR 1017.0. Such rooms which are so subdivided shall not exceed 5,000 square feet (465 $m^2$).
4. In occupancies in Use Group I-3, where a dayroom or group activity space intervenes between an in dividual occupant sleeping room and the access to an *exit*, provided that the sleeping room opens directly to the day space and is not separated in elevation by more than one story.

**1011.1.2 Turnstiles and gates**: Access through turnstiles, gates, rails or similar devices shall not be permitted unless such a device is equipped to swing readily in the direction of *exit* travel under a total force of not more than 15 pounds (73.23 N).

**1011.1.3 Restrictions**: The required width of passageways, *aisle accessways*, aisles and *corridors* shall be maintained free of projections and restrictions; except that the minimum clear width resulting from doors opening into such

spaces shall be one-half of the required width. When fully open, the door shall not project more than seven inches (178 mm) into the required

width. Handrail projections are permitted in accordance with 780 CMR 1022.2.1.

**1011.2 Dead ends**: *exit access* passageways and *corridors* in all stories which serve more than one exit shall provide direct connection to such *exits* in opposite directions from any point in the passageway or *corridor* insofar as practicable. The length of a dead-end passageway or *corridor* shall not be more than 20 feet (6096 mm).

**Exceptions**:

1. In occupancies in Use Group I-3 of Occupancy Conditions II, III or IV (see 780 CMR 308.4), the dead end in a *corridor*, hallway or aisle shall not exceed 50 feet (15240 mm).
2. In occupancies in Use Group B where passageways are bounded by furniture, counters, partitions or similar dividers not more than six feet (1829 mm) in height, the length of a dead-end passageway shall not be more than 50 feet (15240 mm).
3. Passageways or *corridors* within spaces with one *means of egress*.
4. A dead-end passageway or *corridor* shall not be limited in length where the length of the dead-end passageway or *corridor* is less than 2.5 times the least width of the dead-end passageway or *corridor*.

**1011.2.1 Common path of travel**: In occupancies in Use Group B, the length of a *common path of travel* shall not exceed 75 feet (22860 mm).

**Exceptions**:

1. The length of a *common path of travel* in an occupancy in Use Group B shall not be more than 100 feet (30480 mm), provided that the building is equipped throughout with an *automatic sprinkler system* installed in accordance with 780 CMR 906.2.1.
2. Where a tenant space in an occupancy in Use Group B has an occupant load of not more than 30, the length of a *common path of travel* shall not be more than 100 feet (30480 mm).

**1011.3 Width**: The minimum required width of passageways, *aisle accessways*, aisles and *corridors* shall be determined by the most restrictive of the following criteria:

1. 44 inches (1118 mm) where serving an occupant load of greater than 50.
2. 36 inches (914 mm) where serving an occupant load of 50 or less.
3. 96 inches (2438 mm) in an occupancy in Use Group I-2 used for the movement of beds.
4. 72 inches (1829 mm) in an occupancy in Use Group E with more than 100 occupants.
5. The width required for capacity as determined by 780 CMR 1009.0.
6. At least 72 inches (1829 mm) for the main entrance/exit access in an occupancy in use group A-2 with an occupant load of 50 or more – also see 780 CMR 1006.2.2.1.

Aisles and *aisle accessways* shall conform to the requirements of 780 CMR 1011.0 or 780 CMR 1012.0.

**1011.3.1 Capacity**: The required capacity of a *corridor* shall be determined by dividing the occupant load that utilizes the *corridor* for *exit access* by the number of *exits* to which the *corridor* connects, but not less than the capacity of the *exit* element to which the *corridor* leads.

**1011.4 Enclosure**: All *corridors* shall be fireresistance rated in accordance with Table 1011.4 based on the use group of the space and the total required capacity of all of the *exits* from the *corridor*. The *corridor* walls shall comply with 780 CMR 711.0.

**Exceptions**:

1. A fireresistance rating is not required for *corridors* in an occupancy in Use Group E where each room that is occupied for instruction or assembly purposes has at least one-half of the required *means of egress* doors opening directly to the exterior of the building at ground level.
2. A fireresistance rating is not required for *corridors* contained within a *dwelling unit* or a guestroom in an occupancy in Use Group R.

**Table 1011.4**
**CORRIDOR FIRERESISTANCE RATING**

| zUse Group | Total required capacity of all exits from corridor | Required fireresistance rating (hours) | |
|---|---|---|---|
| | | Without sprinkler system | With sprinkler system[d] |
| H-1, H-2, H-3 | All | 1 | 1 |
| H-4 | > 30 | 1 | 1 |
| A, B, E, F, M, S | > 30 | 1 | 0 |
| I-1, R[a] | > 10 | 1 | ½ |
| I-2 | All | 1 | 0[b] |
| I-3 | All | Not permitted | 0[c] |

**Note a**. For a reduction in the fireresistance rating for occupancies in Use Group R, see 780 CMR 1011.4, Exception 2.

**Note b**. For requirements for occupancies in Use Group I-2, see 780 CMR 409.3.

Note c. For a reduction in the fireresistance rating for occupancies in Use Group I-3, see 780 CMR 410.7.

**Note d**. buildings equipped throughout with an automatic sprinkler system in accordance with 780 CMR 906.2.1 or 906.2.2.

**1011.4.1 Corridor walls as separation walls**: Tenant and *dwelling unit* separation walls which are also *corridor* walls shall comply with 780 CMR 1011.0 and the requirements of Table 602.

**Exception**: Tenant separation and *dwelling unit* separation walls which are also *corridor* walls shall not be required to have a fireresistance rating greater than that required by Table

1011.4 where the building is equipped throughout with an *automatic sprinkler system* in accordance with 780 CMR 906.2.1 or 906.2.2.

**1011.4.2 Opening protectives**: All door assemblies from rooms opening onto a *corridor* that is required to be of fireresistance rated construction shall be *fire doors* complying with 780 CMR 716.0.

**1011.5 Exterior balconies**: Exterior *exit access* balconies shall conform to the requirements of 780 CMR 1011.0 for *corridors* and shall be protected to prevent the accumulation of snow and ice in climates subject to those elements.

**1011.5.1 Wall separation**: Exterior *exit access* balconies shall be separated from the interior of the building by walls and opening protectives as required by 780 CMR 1011.4. A fireresistance rating for the wall is not required where the balcony is provided with not less than two approved *stairways* or other approved *means of egress* elements and a dead end does not require travel past an unprotected opening for access to the *stairway* or *means of egress* element.

## 780 CMR 1012.0 ASSEMBLY AISLES AND AISLE ACCESSWAYS

**1012.1 Where required**: In occupancies in Use Group A which contain seats, tables, displays, equipment or other material shall be provided with *aisle accessways* and aisles in accordance with 780 CMR1012.0. These provisions shall also apply to tiered or stepped seating facilities except as modified by 780 CMR 1013.0.

**1012.2 Aisle and aisle accessway width**: The width of *aisle accessways* and aisles shall provide sufficient *means of egress* capacity for the number of persons accommodated by the catchment area served by the *aisle accessway* or aisle (see 780 CMR 1012.2.5). The catchment area served by an *aisle accessway* or aisle is the portion of the total space which is naturally served by that section of the *aisle accessway* or aisle. In establishing catchment areas the assumption shall be made that there is a balanced use of all *means of egress*, with the number of persons in proportion to *means of egress* capacity.

**1012.2.1 Measurement of required minimum width of aisles and aisle accessways**: Where seating is located at a table or counter and is adjacent to an aisle or *aisle accessway*, the measurement of required clear width of the aisle or *aisle accessway* shall be made to a line 19 inches (483 mm) away from the edge of the table or counter. The 19-inch (483 mm) distance shall be measured perpendicular to the side of the table or counter. In the case of other side boundaries for aisles or *aisle accessways* the clear width shall be measured to walls, edges of seating and tread edges, except that handrail projections are permitted.

**1012.2.2 Converging aisles and aisle accessways**: Where *aisle accessways* or aisles converge to form a single path of *means of egress* travel, the required *means of egress* capacity of such path shall not be less than the combined required capacity of the converging *aisle accessways* or aisles.

**1012.2.3 Uniform width of aisles**: Those portions of aisles where *means of egress* is possible in either of two directions shall be uniform in required width.

**1012.2.4 Uniform width of aisle accessways**: Those portions of *aisle accessways* having a required width exceeding 12 inches (305 mm), where *means of egress* is possible in more than one direction, shall be uniform in required width.

**1012.2.5 Capacity of aisles and aisle accessways**: The width of aisles and *aisle accessways* shall provide sufficient capacity in accordance with the following criteria where clear width is measured in accordance with 780 CMR 1012.2.1.

1. At least 0.3 inch (7.5 mm) of width for each person served shall be provided on stairs having riser heights of seven inches (178 mm) or less and tread depths of 11 inches (279 mm) or greater, measured horizontally between tread nosings.
2. At least 0.005 inch (0.1 mm) of additional stair width for each person shall be provided for each 0.10 inch (2.5 mm) of riser height above seven inches (178 mm).
3. Where a *means of egress* requires stair descent, at least 0.075 inch (2 mm) of additional width for each person shall be provided on those portions of stair width not having handrails within a horizontal distance of 30 inches (762 mm).
4. Level or ramped *means of egress* with slopes less than one unit vertical in eight units horizontal (1:8), shall have at least 0.2 inch (5 mm) of clear width for each person served.

**1012.2.6 Minimum width of aisles**: The minimum clear width of aisles shall be: 48 inches (1219 mm) for stairs having seating on each side; 36 inches (914 mm) for stairs having seating on only one side; 23 inches (584 mm) between a stair handrail or guardrail and seating where the aisle is subdivided by a handrail (see 780 CMR 1012.5); 42 inches (1067 mm) for level or ramped aisles having theater-style seating on both sides; 36 inches (914 mm) for all other level or ramped

aisles; and 23 inches (584 mm) between a stair handrail and seating where an aisle does not serve more than five rows on one side.

**1012.2.7 Minimum width of aisle accessways**: *Aisle accessways* shall conform to the requirements of 780 CMR 1012.6 in the case of theater-type seating and to the requirements of

780 CMR 1012.7 in the

**1012.3 Termination**: Each end of a cross aisle shall terminate at an aisle, foyer, doorway or vomitory giving access to an *exit*. Dead-end aisles which terminate only at one end with a cross aisle, foyer, doorway or vomitory giving access to an *exit* shall not be greater than 20 feet (6096 mm) in length.

**Exception**: A longer dead-end aisle is 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 inches (305 mm) plus 0.6 inch (15 mm) for each additional seat above seven in the row.

**1012.4 Walking surfaces**: Aisles with a gradient of one unit vertical in eight units horizontal (1:8) or less shall consist of a ramp having a slip-resistant walking surface. Aisles with a gradient exceeding one unit vertical in eight units horizontal (1:8) shall consist of a series of risers and treads which extend across the full width of aisles and comply with 780 CMRs 1012.4.1 and 1012.4.2.

**1012.4.1 Treads**: Tread depths shall be a minimum of 11 inches (279 mm) and be uniform within each aisle.

**Exception**: Nonuniformities shall not exceed 3/16 inch (5 mm) between adjacent treads.

**1012.4.2 Risers**: Where the gradient of aisle stairs is to be the same as the gradient of adjoining seating areas, the riser height shall not be less than 4 inches (102 mm) nor more than eight inches (203 mm) and shall be uniform within each flight.

**Exception**: Riser height nonuniformity shall be limited to the extent necessitated by changes in the gradient of the adjoining seating area to maintain adequate sightlines. Where nonuniformities exceed 3/16 inch (5 mm) between adjacent risers, the exact location of such nonuniformities shall be indicated with a distinctive marking stripe on each tread at the nosing or leading edge adjacent to the non-uniform risers. Such stripe shall be a minimum of one inch (25 mm) wide and a maximum of two inches (51 mm) wide.

**1012.5 Handrails**: Ramped aisles having a gradient exceeding one unit vertical in 15 units horizontal (1:15) and aisle stairs shall be provided with handrails located either at the side or within the aisle width.

**Exceptions**:

1. Handrails are not required if, at the side of the aisle, there is a guardrail that complies with the requirements for handrails.
2. Handrails are not required for *aisles* with seating on both sides unless there is more than one riser per row of seating. The single riser shall be indicated by a distinctive marking stripe on the leading edge of the tread.

**1012.5.1 Discontinuous rails**: Where there is seating on both sides of the aisle, the handrails 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 at least 22 inches (559 mm) and not greater than 36 inches (914 mm), measured horizontally, and the handrail shall have rounded terminations or bends.

**1012.5.2 Intermediate rails**: Where handrails are provided in the middle of aisle stairs, there shall be an additional intermediate handrail located approximately 12 inches (305 mm) below the main handrail.

**1012.6 Row width**: The minimum clear row width shall not be less than 12 inches (305 mm) measured as the clear horizontal distance from the back of the row ahead and the nearest projection of the row behind. Where chairs have automatic or self-rising seats, the measurement shall be made with the seats in the raised position. Where any chair in the row does not have an automatic or self-rising seat, the measurement shall be made with the seat in the down position. Where tablet-arm chair seating is used, the measurement shall be made with the tablet-arm in the usable position.

**1012.6.1 Dual access**: For rows of seating served by aisles or doorways at both ends, there shall not be more than 100 seats per row. The minimum clear width of 12 inches (305 mm) between rows shall be increased by 0.3 inch (7.5 mm) for every additional seat beyond 14 seats, but the minimum clear width is not required to exceed 22 inches (559 mm).

**1012.6.2 Single access**: For rows of seating served by an aisle or doorway at only one end of the row, the minimum clear width of 12 inches (305 mm) between rows shall be increased by 0.6 inch (15 mm) for every additional seat beyond seven seats, but the minimum clear width is not required to exceed 22 inches (559 mm). However, the path of travel shall not exceed 30 feet (9144 mm) from any seat to a point where a person has a choice of two paths of travel to two *exits*.

**1012.7 Aisle accessways for tables and seating**: *Aisle accessways* serving arrangements of seating at tables or counters, shall have sufficient clear width to conform to the capacity requirements of 780 CMR 1012.2.5, but shall not have less than the appropriate minimum clear width specified in 780 CMR 1012.7.1.

**1012.7.1 Width**: In addition to the width required by 780 CMR 1012.2, *aisle accessway*s shall provide a minimum of 12 inches (305 mm) plus 0.5 inch (13 mm) of width for each additional 1 foot (305 mm), or fraction thereof, beyond 12 feet (3660 mm) of *aisle accessway* length measured from the center of the seat farthest from an aisle.

**Exception**: Portions of an *aisle accessway* having a length not exceeding six feet (1830 mm) and used by a total of not more than four persons.

**1012.7.2 Length**: The length of travel along the *aisle accessway* shall not exceed 36 feet (10973 mm) from any seat to the closest aisle. The path of travel shall not exceed 30 feet (9144 mm) from any seat to the point where a person has a choice of two or more paths of travel to separate *exits*.

**1012.8 Railings**: Railings shall be provided on balconies and galleries in accordance with 780 CMR 1021.4.

## 780 CMR 1013.0 GRANDSTANDS

**1013.1 Scope**: 780 CMR 1013.0 shall apply to all structures with an occupancy in Use Group A which provide permanent, temporary or portable tiered or stepped seating facilities, such as *grandstands*, *bleachers*, folding and telescopic seating. Except as modified by 780 CMR 1013.0, 780 CMR 1012.0 shall apply to all such structures.

**1013.2 Smoke-protected** assembly seating: Assembly seating which is served by a *means of egress* that is not subject to blocking by smoke accumulation within or under a structure shall be considered smoke protected and shall comply with the requirements of 780 CMR 1013.2.1 through 1013.2.3.

**1013.2.1 Roof height**: A smoke-protected assembly seating area with a roof shall have the lowest portion of the roof not less than 15 feet (4572 mm) above the highest aisle or *aisle accessway*.

**1013.2.2 Automatic sprinklers**: All areas enclosed with walls and ceilings in structures containing smoke-protected assembly seating shall be equipped throughout with an *automatic sprinkler system* in accordance with 780 CMR 906.0.

**Exception**: An *automatic sprinkler system* is not required for either of the following:

1. The floor area used for a contest, performance or entertainment provided that the roof construction is more than 50 feet (15240 mm) above the floor level and the use of the floor is restricted to low fire-hazard occupancies.
2. Press boxes and storage facilities less than 1,000 square feet (9.3 $m^2$) in area in conjunction with outdoor seating facilities where all *means of egress* in the seating area are essentially open to the outside.

**1013.2.3 Smoke control**: All *means of egress* serving a smoke-protected assembly seating area shall be provided with a smoke control system complying with 780 CMR 921.0 or natural *ventilation* designed to maintain the smoke level at least six feet (1829 mm) above the floor of the *means of egress*.

**1013.3 Travel distance**: The *exit access* travel distance shall comply with 780 CMR 1006.5 except that in a smoke-protected assembly seating area, the travel distance from each seat to the nearest entrance to an egress vomitory portal or egress concourse shall not exceed 200 feet (60960 mm). The travel distance from the entrance to a vomitory portal or egress concourse to an approved egress stair, ramp or walk at the building exterior shall not exceed 200 feet (60960 mm). Where aisles are required, the distance shall be measured along the aisles and *aisle accessways* without travel over or on the seats.

**1013.4 Minimum egress widths**: The minimum clear width of *stairways*, passageways, doorways, ramps and other *means of egress* shall provide sufficient capacity in accordance with the provisions of 780 CMR 10, except as modified by Table 1013.4.

**Table 1013.4**
**MINIMUM EGRESS WIDTHS**
**SMOKE-PROTECTED ASSEMBLY SEATING**

| Number of seats in the space | Inches[b] of clear width per seat served | | | |
|---|---|---|---|---|
| | Stairs with handrails[a] within 30 inches | Stairs without handrails[a] within 30 inches | Aisles, accessways, doorways and ramps not steeper than 1 in 10 slope | Ramps steeper than 1 in 10 slope |
| 2,000 or less | 0.300 | 0.375 | 0.200 | 0.220 |
| 5,000 | 0.200 | 0.250 | 0.150 | 0.165 |
| 10,000 | 0.130 | 0.163 | 0.100 | 0.110 |
| 15,000 | 0.096 | 0.120 | 0.070 | 0.077 |
| 20,000 | 0.076 | 0.095 | 0.056 | 0.066 |
| 25,000 or more | 0.060 | 0.075 | 0.044 | 0.048 |

**Note a**. If risers exceed 7 inches in height, the minimum clear width of stairs determined from the table shall be multiplied by factor A where A = 1 + [(Riser Height - 7.0) ÷ 5].

**Note b**. 1 inch = 25.4 mm.

**1013.5 Aisles**: Aisles shall be provided in all seating facilities except that an aisle is not required where all of the following conditions exist.

1. Seats are without backrests.
2. The rise from row to row does not exceed six inches (152 mm) per row.

3. The row spacing does not exceed 28 inches (711 mm) unless the seatboards and footboards are at the same elevation.
4. The number of rows does not exceed 16 in height.
5. The first seatboard is not more than 12 inches (305 mm) above the ground, floor surface or cross aisle below.
6. Seatboards have a continuous flat surface.
7. Seatboards provide a walking surface with a minimum width of 11 inches (279 mm).
8. Egress from seating is not restricted by rails, guards or other obstructions.

**1013.5.1 Termination**: Where seats are without backrests, dead ends in vertical aisles shall not exceed a distance of 16 rows. For smoke-protected assembly seating, the dead ends in vertical aisles shall not exceed a distance of 21 rows. For smoke-protected assembly seating, a longer dead-end aisle is permitted 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 inches (305 mm) plus 0.3 inch (8 mm) for each additional seat above seven in the row.

**1013.5.2 Row width**: For smoke protected assembly seating, the maximum number of seats in a row that has a minimum clear aisle accessway width of 12 inches (305 mm) shall be as specified in Table 1013.5.2.

Where the number of seats per row exceeds that specified in Table 1013.5.2, the minimum clear aisle accessway width for rows served by aisles or doorways at both ends shall be 12 inches (305 mm) plus 0.3 inch (7.5 mm) for every additional seat beyond that specified in Table 1013.5.2 and there shall be not more than 100 seats per row; and for rows served by an aisle or doorway at only one end of the row, the minimum clear *aisle accessway* width shall be 12 inches (305 mm) plus 0.6 inch (15 mm) for every additional seat beyond that specified in Table 1013.5.2.

**Table 1013.5.2**
**ROW LENGTH WITH 12-INCH AISLE ACCESSWAY SMOKE-PROTECTED ASSEMBLY SEATING**

| Total number of seats in the space | No. Of seats per row permitted to have a minimum 12-inch[a] clear width aisle accessway | |
|---|---|---|
| | Aisle or doorway at both ends of row | Aisle or doorway at one end of row |
| Less than 4,000 | 14 | 7 |
| 4,000 | 15 | 7 |
| 7,000 | 16 | 8 |
| 10,000 | 17 | 8 |
| 13,000 | 18 | 9 |
| 16,000 | 19 | 9 |
| 19,000 | 20 | 10 |
| 22,000 or more | 21 | 11 |

**Note a**. 1 inch = 25.4 mm.

**1013.5.3 Single access row**: For rows of seating served by an aisle or doorway at only one end of the row in smoke-protected assembly seating, the *common path of travel* from any seat to a point where a person has a choice of two directions of egress travel shall not exceed 50 feet (15240 mm).

**1013.6 Bleacher footboards**: *Bleacher* footboards shall be provided for all rows of seats above the third row or beginning at such a point where the seatboard is more than two feet (610 mm) above the ground, floor surface or cross aisle below. A separate footboard is not required where the same platform is used for both seating and the footboard, provided that each level or platform is not less than 24 inches (610 mm) wide. On a horizontally projected plane, horizontal gaps between footboards and seatboards shall not exceed ¼ inch (6 mm). Openings between footboards and seatboards which are located more than 30 inches (762 mm) above the floor or grade below shall be provided with intermediate construction such that a sphere with a diameter of four inches (102 mm) cannot pass through the opening.

**1013.7 Spaces underneath seats**: Spaces underneath *grandstand* seats shall be kept free of all combustible and *flammable* materials and shall not be occupied or used for other than *exits*; except that where enclosed in not less than one-hour fireresistance rated construction, the code official shall approve the use of such spaces for other purposes, provided that the safety of the public is not endangered.

## 780 CMR 1014.0 STAIRWAYS

**1014.1 General**: All *stairways* shall comply with the provisions of 780 CMR 1014.0. 780 CMR 1014.11 shall be applicable only to interior *stairways*. 780 CMR 1014.12 shall be applicable only to exterior *stairways*.

**1014.1.1 Walking surface**: The maximum slope of the walking surface of treads and landings shall be one unit vertical in 48 units horizontal (1:48).

**1014.2 Egress capacity**: The egress capacity of *stairways* and doors shall be computed in accordance with 780 CMR 1009.0.

**1014.3 Width**: All *means of egress stairways* shall not be less than 44 inches (1118 mm) in width.

**Exceptions**:
1. *Stairways* serving buildings of single-exit construction where permitted by 780 CMR 1010.3 shall not be less than 36 inches (914 mm) in width.

2. Spiral *stairways* as provided for in 780 CMR 1014.6.4.

3. *Stairways* serving an occupancy in Use Group R-3 shall not be less than 36 inches (914 mm) in width.
4. *Stairways* serving and contained within a single residential *dwelling unit* shall not be less than 36 inches (914 mm) in width.
5. *Stairways* serving buildings having a total occupant load of 50 or less shall not be less than 36 inches (914 mm) in width.
6. Where a *stairway* lift is installed on *stairways* serving occupancies in Use Group R-3 or within *dwelling units* in occupancies in Use Group R-2, a clear passage width not less than 20 inches (508 mm) shall be provided.

**1014.3.1 Restrictions**: *Means of egress stairways* shall not reduce in width in the direction of egress travel. Projections into a required *stairway* width are prohibited, except at and below handrail height where, at each handrail, the projections shall not exceed 3½ inches (89 mm) into the required width.

**1014.3.2 Landing width**: The least dimension of landings and platforms in *means of egress stairways* shall not be less than the required width of the *stairway*, except that the landing dimension in the direction of egress travel is not required to exceed four feet (1219 mm) where the travel from one stair flight to the next stair flight is a straight run.

**1014.4 Headroom**: The minimum headroom in all parts of a *stairway* shall not be less than 80 inches (2032 mm) measured vertically from the tread nosing or from the floor surface of the landing or platform.

**1014.5 Vertical rise**: A *means of egress stairway* shall not have a height of vertical rise of more than 12 feet (3658 mm) between landings and intermediate platforms.

**1014.6 Treads and risers**: Maximum riser height shall be seven inches (178 mm) and minimum riser height shall be four inches (102 mm). Minimum tread depth shall be 11 inches (279 mm), measured horizontally between the vertical planes of the foremost projection of adjacent treads and at a right angle to the tread's leading edge.

**Exceptions**:
1. Winders in accordance with 780 CMR 1014.6.3.
2. Spiral *stairways* in accordance with 780 CMR 1014.6.4.
3. Circular *stairways* in accordance with 780 CMR 1014.6.5.
4. *Alternating tread stairways* in accordance with 780 CMR 1014.6.6.
5. *Stairways* serving as aisles in assembly seating areas where the *stairway* pitch or slope is set, for sightline reasons, by the slope of the adjacent seating area.
6. Any *stairway* replacing an existing *stairway* within a space where, because of existing construction, the pitch or slope cannot be reduced.
7. Existing *stairways*.
8. In occupancies in Use Group R-3 and within *dwelling units* in occupancies in Use Group R-2, the maximum riser height shall be 8¼ inches (210 mm) and the minimum tread depth shall be nine inches (229 mm). A one-inch (25 mm) nosing shall be provided on *stairways* with solid risers.
9. *Stairways* in penal facilities serving guard towers, observation stations and control rooms not more than 250 square feet (23 $m^2$ ) in area shall be permitted to have risers not exceeding eight inches (203 mm) in height and treads not less than nine inches (229 mm) in depth.

**1014.6.1 Profile**: The radius of curvature at the leading edge of the tread shall not be greater than ½ inch (13 mm). Bevelling of nosings shall not exceed ½ inch (13 mm). Risers shall be solid and vertical or sloped from the underside of the leading edge of the tread above at an angle not more than 30° (0.52 rad) from the vertical. The leading edge of tread shall not project more than 1½ inches (38 mm) beyond the tread below.

**Exception**: Solid risers are not required for *stairways* serving dwelling units which are not required to be accessible or adaptable in accordance with ***521 CMR, the Rules and Regulations of the Architectural Access Board, referenced in 780 CMR 11, and listed in Appendix A***, provided that the opening between treads does not permit the passage of a sphere with a diameter of four inches (102 mm).

**1014.6.2 Dimensional uniformity**: There shall not be variation exceeding 3/16 inch (5 mm) in the depth of adjacent treads or in the height of adjacent risers. The tolerance between the largest and smallest riser or between the largest and smallest tread shall not exceed _ inch (10 mm) in any flight of stairs.

**Exceptions**:
1. Where the bottom riser adjoins a sloping *public way*, walk or driveway which has an established grade and serves as a landing, a variation in the height of the bottom riser shall not exceed three inches (76 mm) in every three feet (914 mm) of *stairway* width.
2. On *stairways* serving as aisles in assembly seating, where necessitated by changes in the gradient of adjoining seating areas to maintain adequate sightlines, the maximum nonuniformity of riser heights within a flight and the nonuniformity between adjacent risers shall not apply. Where a nonuniformity

exceeds 3/16 inch (5 mm) between adjacent risers, the exact location of the nonuniformity

shall be indicated with a distinctive marking stripe on each tread at the nosing or leading edge adjacent to the nonuniform risers.

**1014.6.3 Winders**: Winders shall not be permitted in required *means of egress stairways* except in occupancies in Use Group R-3 and *stairways* serving a single *dwelling unit*. Such winders shall have a tread depth of not less than nine inches (229 mm) at a point not more than 12 inches (305 mm) from the side where the tread is narrower and the minimum tread depth shall not be less than six inches (152 mm).

**1014.6.4 Spiral stairways**: Spiral *stairways* shall not be used as an element of a *means of egress* except: in occupancies in Use Group R-3; within a single *dwelling unit*; from a *mezzanine* area not more than 250 square feet (23.25 $m^2$) in area which serves not more than five occupants; and in penal facilities from a guard tower, observation station or control room not more than 250 square feet (23 $m^2$) in area. The minimum width of all spiral *stairways* shall be 26 inches (660 mm) with each tread having a 7½-inch (191 mm) minimum tread depth at 12 inches (305 mm) from the narrow edge. All treads shall be identical and the rise shall not be more than 9½-inches (241 mm). A minimum headroom of six feet six inches (1981 mm) shall be provided.

**1014.6.5 Circular *stairways***: Circular *stairways* shall have a minimum tread depth and a maximum riser height in accordance with 780 CMR 1014.6 and the smaller radius shall not be less than twice the width of the *stairway*. The minimum tread depth measured 12 inches (305 mm) from the narrower end of the tread shall not be less than 11 inches (279 mm).

**1014.6.6 Alternating tread stairways**: *Alternating tread stairways* are permitted as an element of a *means of egress* in buildings from a *mezzanine* area not more than 250 square feet (23 $m^2$) in *area* and which serves not more than five occupants; and in penal facilities, from a guard tower, observation station or control room not more than 250 square feet (23 $m^2$) in area. *Alternating tread stairways* are also permitted for access to roofs as provided for in 780 CMR 1027.0.

**1014.6.6.1 Handrails of alternating tread stairways**: Handrails shall be provided on both sides of *alternating tread stairways* and shall conform to 780 CMR 1022.0.

**1014.6.6.2 Treads of alternating tread stairways***: Alternating tread stairways* shall have a minimum projected tread of five inches (127 mm), a minimum tread depth of 8½ inches (216 mm), a minimum tread width of seven inches (178 mm) and a maximum riser to the next surface of the alternating tread of 9½ inches (241 mm). The initial tread of the *stairway* shall begin at the same elevation as the platform, landing or floor surface.

**Exception**: *Alternating tread stairways* used as an element of a *means of egress* in buildings from a mezzanine area not more than 250 square feet (23 $m^2$) in area which serves not more than five occupants shall have a minimum projected tread of 8½ inches (216 mm) with a minimum tread depth of 10½ inches (267 mm). The rise to the next alternating tread surface shall not be more than eight inches (203 mm).

**1014.7 Stairway guards and handrails**: *Stairways* shall have continuous guards and handrails on both sides. Intermediate handrails are required so that all portions of the required width of stairs are within 30 inches (762 mm) of a handrail. On monumental stairs, handrails shall be located along the most direct path of egress travel. Handrails shall be provided for *alternating tread stairways* in accordance with 780 CMR 1014.6.6.1. Guards shall be constructed in accordance with 780 CMR 1021.0. Handrails shall be constructed in accordance with 780 CMR 1022.0.

**Exceptions**:

1. *Stairways* with fewer than three risers are not required to have handrails where serving a single *dwelling unit* or where such *stairways* are not in an *exit access corridor* or aisle, *exit* or *exit discharge*.
2. Aisle stairs provided with a center handrail or serving seating on one side shall be equipped with a minimum of one handrail.
3. *Stairways* within a *dwelling unit* shall be equipped with a minimum of one handrail.
4. Spiral *stairways* shall be equipped with a minimum of one handrail.

**1014.8 Egress doors**: *Means of egress stairway* doors shall provide an egress capacity of not less than the required capacity of the *stairway* which serves the floor or area from which the egress door leads.

**1014.8.1 Width**: The minimum required width of every door to or from a *means of egress stairway* shall be determined by the most restrictive of the following criteria:

1. 29¾-inch (756 mm) clear width within a *dwelling unit* that is not required to be accessible or adaptable.
2. 36-inch (914 mm) minimum width of door leaf in an occupancy in Use Group I-2.
3. 32-inch (813 mm) clear width in all other cases.

**Exception**: When applicable for A-2 use groups with an occupant load of 50 or greater also see 780 CMR 1006.2.2.1 and 1011.3

**1014.8.2 Direction of swing**: All *means of egress* doors shall swing on a landing in the direction of egress travel. When opening, egress doors shall not reduce the width of landings to less than one-

half of the required width. When fully open, *means of egress* doors shall not project more than seven inches (178 mm) into the required width.

**Exception**: Doors leading from a room or tenant space to a *stairway* in buildings in which only one *exit* is required are not required to swing in the direction of egress travel.

**1014.8.3 Door construction**: All doorway opening protectives shall be *fire doors* complying with 780 CMR 716.0. *Labeled means of egress fire doors* shall have a maximum transmitted temperature end point of not more than 450°F (232°C) above ambient at the end of 30 minutes of standard fire test exposure.

**1014.9 Stairway construction**: All *stairways* shall be built of materials consistent with the types of materials permitted for the type of construction of the building; except that wood handrails shall be permitted for all types of construction. Such *stairways* shall have solid treads and landing platforms, and all finish floor surfaces shall be of slip-resistant materials.

**1014.9.1 Strength**: All *stairways*, platforms and landings in other than occupancies in Use Group R-3 shall be adequate to support a *live load* of 100 pounds per square foot (488.20 kg/m$^2$) and a concentrated *load* of 300 pounds (136.20 kg).

**1014.10 Discharge identification**: *Exit stairways* which continue beyond the *level of exit discharge* shall be interrupted at the *level of exit discharge* by partitions, doors or other effective means of preventing persons from continuing past the floor of discharge while egressing.

**1014.11 Interior stairway enclosures**: Interior *exit stairways* shall be enclosed with *fire separation assemblies* having a fireresistance rating of not less than two hours except that such *stairways* in occupancies in Use Group A, B, E, F, H-4, I, M, R or S which connect less than four stories shall be enclosed with *fire separation assemblies* having a fireresistance rating of not less than one hour. An *exit stairway* enclosure shall not be used for any purpose other than *means of egress*. Openings in exit enclosures, other than unexposed exterior openings, shall be limited to those necessary for *exit access* to the enclosure from normally occupied spaces and for egress from the enclosure.

**Exceptions**:

1. *Stairways* are not required to be enclosed in occupancies in Use Group A-5 in which all portions of the *means of egress* are essentially open to the outside.
2. *Stairways* serving and contained within a single residential *dwelling unit* in occupancies in Use Group R-2 or R-3 are not required to be enclosed.
3. *Stairways* that are not a required *means of egress* element are not required to be enclosed where such *stairways* comply with 780 CMR 713.3.
4. *Stairways* in open parking structures which serve only the parking structure are not required to be encloed.
5. *Stairways* in occupancies in Use Group I-3 as provided for in 780 CMR 410.3.7.

**1014.11.1 Exterior walls**: Exterior walls of an enclosed *exit stairway* shall comply with the requirements of 780 CMR 705.0 for exterior walls. Where nonrated walls or unprotected openings enclose the exterior of the *stairway*, the building exterior walls within ten feet (3048 mm) horizontally of the nonrated wall or unprotected opening shall be constructed as required for *stairway* enclosures, including opening protectives, but are not required to exceed a one-hour fireresistance rating with ¾-hour opening protectives. This construction shall extend vertically from a point ten feet (3048 mm) above the topmost landing of the *stairway* or to the roof line, whichever is lower, and down to the ground.

**1014.11.2 Penetrations**: Penetrations into and openings through an *exit* enclosure assembly are prohibited except for required *exit* doors, ductwork and equipment necessary for independent stair pressurization, required *ventilation sprinkler* piping, *standpipes* and electrical conduit serving the *stairway* and terminating at a steel box that does not exceed 16 square inches (10323 mm$^2$) in area. There shall not be any penetrations or communicating openings, whether protected or not between adjacent *stairway* enclosures.

**1014.11.3 Door locks**: All interior *stairway means of egress* doors shall be openable from both sides without the use of a key or special knowledge or effort.

**Exceptions**:

1. *Stairway* discharge doors shall be operable from the egress side and shall only be locked from the opposite side.
2. 780 CMR 1014.0 shall not apply to doors arranged in accordance with 780 CMR 403.10 and 1017.4.

**1014.11.4 Exit signs**: Each door to an enclosed *exit stairway* shall be equipped with tactile signage reading "Exit" complying with 521 CMR listed in ***Appendix A*** and installed on the side of the door from which *egress* is to be made.

**1014.11.5 Stairway floor number signs**: A sign shall be provided at each floor landing in all interior *exit stairways* connecting more than three stories designating the floor level above and below the *level of exit discharge*, the identification of the

*stairway* and the availability of roof access from that *stairway*. The sign shall be located

approximately five feet (1524 mm) above the floor landing in a position which is readily visible when the doors are in the open and closed positions.

**1014.12 Exterior stairways**: Exterior *stairways* shall have openings on at least one side facing an *outer court*, yard or *public way*. The openings shall have an aggregate width of not less than 20% of the *stairway* perimeter and an aggregate area on each level of not less than 12% of the total perimeter wall area of each level. In other than occupancies in Use Group R-3, treads, platforms and landings which are part of exterior stairways in climates subject to snow or ice shall be protected to prevent accumulation of same. Exterior *stairways* shall not be accepted as an *exit* in the following cases:

1. Occupancies in Use Groups I-2 and I-3 in buildings that exceed four stories or 50 feet (15240 mm) in *height*.
2. Floors that exceed five stories or 65 feet (19812 mm) in height above the *level of exit discharge*.

**1014.12.1 Location**: Exterior *exit stairways* shall not project beyond the *street lot line*. Exterior *exit stairways* shall be located at least ten feet (3048 mm) from adjacent *lot lines* and from other buildings on the same lot unless openings in such buildings are protected by ¾-hour opening protectives.

**Exception**: Noncombustible exterior *stairways* constituting not more than 50% of the required *means of egress* shall be exempt from the ten-foot (3048 mm) *fire separation distance* requirement.

**1014.12.2 Protection**: Exterior *exit* stairs shall be separated from the interior of the building by walls with a fireresistance rating of not less than one hour, with fixed or self-closing opening protectives as required in 780 CMR 1014.11. This protection shall extend vertically from a point ten feet (3048 mm) above the topmost landing or the roof line, whichever is lower, down to the ground, and shall extend horizontally ten feet (3048 mm) from each side of the *stairway*. Openings within the horizontal ten-foot (3048 mm) extension of the protected walls beyond the *stairway* shall be equipped with fixed ¾-hour opening protective assemblies.

**Exceptions**:

1. Occupancies, other than those in Use Group R-1 or R-2, in buildings that are two stories or less above grade where the level of *exit discharge* is the first *story above grade*.
2. Separation from the interior of the building is not required where the exterior *stairway* is served by an exterior *exit access* balcony that connects two remote exterior *stairways* or other approved *exits*, with a perimeter which is not less than 50% open. To be considered open, the opening shall be a minimum of 50% of the height of the enclosing wall, with the top of the openings not less than seven feet (2134 mm) above the top of the balcony.
3. Separation from the interior of the building is not required for an exterior *stairway* located in a building or structure that is permitted to have unenclosed interior *exit stairways* in accordance with 780 CMR 1014.11.

## 780 CMR 1015.0 SMOKEPROOF ENCLOSURES

**1015.1 General**: A *smokeproof enclosure* shall consist of an enclosed interior *exit stairway* that conforms to 780 CMR 1014.0 and an outside balcony or a *ventilated* vestibule meeting the requirements of 780 CMR 1015.0. Where access to the roof is required by 780 CMR 1027.0, such access shall be from the *smokeproof enclosure* where a *smokeproof enclosure* is required.

**1015.2 Where required**: In buildings having a height of 70 feet above the grade plane, at least one exit stairwell shall be protected by a smokeproof enclosure serving all floor levels. In buildings having exit stairwells more than 30 feet below the *level of exit discharge*, at least one exit stairwell shall be protected by a smokeproof enclosure serving all floor levels located below the *level of exit discharge*.

**Exception**: Occupancies in Use Group I-2.

**1015.3 Access**: Access to the stair shall be from every story and shall be by way of a vestibule or by way of an open exterior balcony. The minimum dimension of the vestibule shall not be less than the required width of the *corridor* leading to the vestibule but shall not have a width of less than 44 inches (1118 mm) and shall not have a length of less than 72 inches (1829 mm) in the direction of egress travel.

**1015.4 Construction**: The *smokeproof enclosure* shall be separated from the remainder of the building by not less than a two-hour fireresistance rated *fire separation assembly* without openings other than the required *means of egress* doors. The vestibule shall be separated from the *stairway* by not less than a two-hour fireresistance rated *fire separation assembly*. The open exterior balcony shall be constructed in accordance with the fireresistance rating requirements for floor construction.

**1015.4.1 Door closers**: All doors in a *smokeproof enclosure* shall be self-closing or shall be automatic-closing by actuation of a smoke detector installed at the floor side entrance to the *smokeproof enclosure* in accordance with 780 CMR 716.5. The actuation of the smoke detector on any door shall activate the closing

devices on all doors in the *smokeproof enclosure* at all levels. Smoke detectors shall be installed in accordance with 780 CMR 918.8.

**1015.5 Natural ventilation alternative**: The provisions of 780 CMR 1015.5.1 through 1015.5.3 shall apply to *ventilation* of *smokeproof enclosures* by natural means.

**1015.5.1 Balcony doors**: Where access to the *stairway* is by way of an open exterior balcony, the door assembly into the enclosure shall be a *fire door* in accordance with 780 CMR 716.0.

**1015.5.2 Vestibule doors**: Where access to the *stairway* is by way of a vestibule, the door assembly into the vestibule shall be a *fire door* complying with 780 CMR 716.0. The door assembly from the vestibule to the *stairway* shall have not less than a 20-minute fire protection rating complying with 780 CMR 716.0.

**1015.5.3 Vestibule ventilation**: Each vestibule shall have a minimum net area of 16 square feet (1.49 $m^2$) of opening in a wall facing an *outer court*, yard or *public way* which is at least 20 feet (6096 mm) in width.

**1015.6 Mechanical ventilation alternative**: The provisions of 780 CMR 1015.6.1 through 1015.6.4 shall apply to *ventilation* of *smokeproof enclosures* by mechanical means.

**1015.6.1 Vestibule doors**: The door assembly from the building into the vestibule shall be a *fire door* complying with 780 CMR 716.0. The door assembly from the vestibule to the *stairway* shall have not less than a 20-minute fire protection rating in accordance with 780 CMR 716.0. The door from the building into the vestibule shall be provided with gaskets or other provisions to minimize air leakage.

**1015.6.2 Vestibule ventilation**: The vestibule shall be supplied with not less than one air change per minute, and the exhaust shall not be less than 150% of supply. Supply air shall enter and exhaust air shall discharge from the vestibule through separate, tightly constructed ducts used only for that purpose. Supply air shall enter the vestibule within six inches (152 mm) of the floor level. The top of the exhaust register shall be located at the top of the smoke trap but not more than six inches (152 mm) down from the top of the trap, and shall be entirely within the smoke trap area. Doors in the open position shall not obstruct duct openings. Duct openings with controlling dampers are permitted where necessary to meet the design requirements, but dampers are not otherwise required.

**1015.6.2.1 Engineered ventilation system**: Where a specially engineered system is used, the systems shall exhaust a quantity of air equal to not less than 90 air changes per hour from any vestibule in the emergency operation mode and shall be sized to handle three vestibules simultaneously. Smoke detectors shall be located at the floor side entrance to each vestibule and shall activate the system for the affected vestibule. Smoke detectors shall be installed in accordance with 780 CMR 918.8.

**1015.6.3 Smoke trap**: The vestibule ceiling shall be at least 20 inches (508 mm) higher than the door opening into the vestibule to serve as a smoke and heat trap and to provide an upward moving air column. The height shall not be decreased unless approved and justified by design and test.

**1015.6.4 Stair shaft air movement system**: The stair *shaft* shall be provided with a dampered relief opening and supplied with sufficient air to maintain a minimum positive pressure of 0.10 inch of water column (24.88 P) in the *shaft* relative to the vestibule with all doors closed.

**1015.7 Ventilating equipment**: The activation of *ventilating* equipment required by the alternatives in 780 CMR 1015.6 shall be by smoke detectors installed at each floor level at an approved location at the entrance to the *smokeproof enclosure*. When the closing device for the stair *shaft* and vestibule doors is activated by smoke detection or power failure, the mechanical equipment shall activate and operate at the required performance levels. Smoke detectors shall be installed in accordance with 780 CMR 918.8.

**1015.7.1 Ventilation systems**: *Smokeproof enclosure ventilation* systems shall be independent of other building *ventilation* systems. The equipment and ductwork shall comply with one of the following:

1. Equipment and ductwork shall be located exterior to the building and shall be directly connected to the *smokeproof enclosure* or connected to the *smokeproof enclosure* by ductwork enclosed by two-hour fireresistance rated *fire separation assemblies*.
2. Equipment and ductwork shall be located within the s*mokeproof enclosure* with intake or exhaust directly from and to the outside or through ductwork enclosed by two-hour fireresistance rated *fire separation assemblies*.
3. Equipment and ductwork shall be located within the building if separated from the remainder of the building, including other mechanical equipment, by two-hour fireresistance rated *fire separation assemblies*.

**1015.7.2 Standby power**: Mechanical vestibule and stair *shaft ventilation* systems and automatic fire detection systems shall be powered by an approved standby power system conforming to 780 CMR 403.9.1 and ***527 CMR 12.00, the Massachusetts Electrical Code, referenced in 780 CMR 27, and listed in Appendix A***.

NON-TEXT PAGE

**1015.7.3 Acceptance and testing**: Before the mechanical equipment is approved, the system shall be tested in the code official's presence to confirm that the system is operating in compliance with these requirements.

## 780 CMR 1016.0 RAMPS

**1016.1 Capacity**: The capacity of a ramp used as a *means of egress* component shall be computed in accordance with 780 CMR 1009.0.

**Note**: For ramp design requirements related to building access issues, refer to 780 CMR 11.00

**1016.2 Minimum dimensions**: The minimum dimensions of *means of egress* ramps shall comply with 780 CMR 1016.2.1 through 1016.2.3.

**1016.2.1 Width**: The minimum width of a *means of egress* ramp shall not be less than that required for *corridors* by 780 CMR 1011.3.

**1016.2.2 Headroom**: The minimum headroom in all parts of the *means of egress* ramp shall not be less than 80 inches (2032 mm).

**1016.2.3 Restrictions**: *Means of egress* ramps shall not reduce in width in the direction of egress travel. Projections into the required ramp and landing width are prohibited except at and below handrail height where, at each handrail, the projections shall not exceed 3½ inches (89 mm) into the required width. Doors opening onto a landing shall not reduce the clear width to less than 42 inches (1067 mm).

**1016.3 Maximum slope**: The maximum slope of *means of egress* ramps in the direction of travel shall be one unit vertical in 12 units horizontal (1:12); except the maximum slope shall be: one unit vertical in eight units horizontal (1:8) if the rise is limited to three inches (76 mm); one unit vertical in ten units horizontal (1:10) if the rise is limited to six inches (152 mm). The maximum slope across the direction of travel shall be one unit vertical in 48 units horizontal (1:48).

**Exception**: Aisles in areas of Use Group A shall comply with 780 CMR 1012.0.

**1016.4 Landings**: Ramp slopes of one unit vertical in 12 units horizontal (1:12) or steeper shall have landings at the top, bottom, all points of turning, entrance, *exit* and at doors. Ramps shall not have a vertical rise greater than 30 inches (762 mm) between landings. The maximum slope of landings shall be one unit vertical in 48 units horizontal (1:48). The least dimension of a landing shall not be less than the required width of the ramp except that the landing dimension in the direction of travel is not required to exceed four feet (1219 mm) where the travel from one ramp to the next ramp is a straight run.

**Exception**: Aisles in areas of Use Group A shall comply with 780 CMR 1012.0.

**1016.5 Guards and handrails**: Guards shall be provided on both sides of the ramp and shall be constructed in accordance with 780 CMR 1021.0. Handrails conforming to 780 CMR 1022.0 shall be provided on both sides of every ramp having a slope greater than one unit vertical in 20 units horizontal (1:20). Handrails are not required on ramps where the vertical rise between landings is six inches (152 mm) or less.

**Exception**: Handrails in aisles in occupancies in Use Group A shall comply with 780 CMR 1012.0.

**1016.5.1 Drop-offs**: The sides of ramps and landings with a drop-off shall have a curb with a minimum four-inch (102 mm) height above the walking surface or shall be provided with a guardrail.

**1016.6 Ramp construction**: Ramps used as an *exit* shall conform to the applicable requirements of 780 CMR 1014.9 as to materials of construction and enclosure.

**1016.6.1 Surface**: For all slopes exceeding one unit vertical in 20 units horizontal (1:20) and where the use is such as to involve danger of slipping, the ramp shall be surfaced with approved slip-resistant materials.

**1016.6.2 Exterior ramps**: Exterior ramps and landings shall be designed and constructed to prevent water from accumulating on the walking surface.

## 780 CMR 1017.0 MEANS OF EGRESS DOORWAYS

**1017.1 General**: The requirements of 780 CMR 1017.0 shall apply to all doorways serving as a component or element of a *means of egress*, except as provided for in 780 CMR 1014.8, 1014.12.2, 1015.5.1.1015.5.2 and 1015.6.1.

**1017.1.1 Floor surface**: The floor surface on both sides of a door shall be at the same elevation. The floor surface over which the door swings shall be at the same elevation as the floor level at the threshold and shall extend from the door in the closed position a distance equal to the door width.

**Exception**: This requirement shall not apply to:

1. Exterior doors, as provided for in 780 CMR 1005.6, which are not on an accessible route.
2. Variations in elevation due to differences in finish materials, but not more than ½ inch (13 mm).

Thresholds at doorways shall not exceed ¾ inch (19 mm) in height above the finished floor surface for exterior residential sliding doors or ½ inch (13 mm) for all other doors. Raised thresholds and floor level changes greater than ¼ inch (6 mm) at doorways shall be beveled with a slope not greater than one unit vertical in two units horizontal (1:2).

**1017.2 Number of doorways**: Each occupant of a room or space shall have access to at least two *exits* or *exit access* doors from the room or space where the occupant load of the space exceeds that listed in Table 1017.2, or where the travel distance from any point within the space to an *exit* or *exit access* door exceeds that listed in Table 1017.2. Where the occupant load of a room or space is between 501 and 1,000, a minimum of three *exits* or *exit access* doors shall be provided. Where the occupant load of a room or space exceeds 1,000, a minimum of four *exits* or *exit access* doors shall be provided.

**Exceptions**:

1. Boiler, incinerator and furnace rooms shall be provided with two egress doorways where the area exceeds 500 square feet (47 $m^2$) and individual fuel-fired equipment exceeds 400,000 Btuh (117 kW) input capacity. Door ways shall be separated by a horizontal distance equal to not less than one-half of the diagonal dimension of the room. Where two doorways are required by this exception, a fixed ladder access out of the room shall be permitted in lieu of one doorway.
2. In an occupancy in Use Group I-2, any room and any suite of rooms as permitted in 780 CMR 1011.1.1, Exception No.3, of more than 1,000 square feet (93 $m^2$), shall have at least two *exit access* doors remote from each other.

**Table 1017.2**
**SPACES WITH ONE MEANS OF EGRESS**

| Use Group | Maximum occupant load | Maximum travel distance (feet)[b] |
|---|---|---|
| A, B, E, F, M | 50 | 75 |
| H-1[a], H-2, H-3 | 3 | 25 |
| H-4 | 10 | 75 |
| I, R | 10 | 75 |
| S | 30 | 100 |

**Note a**. For requirements for areas and spaces in Use Group H-1, see 780 CMR 418.2.2.

**Note b**. 1 foot = 304.8 mm.

**1017.2.1 Entrance and egress doorways**: Where separate doors are provided for entrance and *means of egress*, the entrance door shall be clearly marked "Entrance Only" in letters not less than six inches (152 mm) in height and legible from both inside and outside.

**1017.2.2 Location of doors**: The required doorways opening from a room or space within a building and leading to an *exit access* shall be located as remote as practicable from each other and shall conform to 780 CMR 1006.4.1. The distance of *exit access* travel from any point in a room or space to a required *exit* door shall not exceed the limitations of 780 CMR 1006.5.

**1017.2.3 Door arrangement**: The space between doors in series shall not be less than seven feet (2134 mm) as measured when the doors are in the closed position.

**Exception**: Power-operated doors and occupancies in Use Groups I-1 and R-3.

**1017.3 Size of doors**: The minimum width of each door opening shall be sufficient for the occupant load thereof and shall provide a clear width of not less than 32 inches (813 mm). Where 780 CMR 1017.0 requires a minimum clear width of 32 inches (813 mm) and a door opening includes two door leaves without a mullion, one leaf shall provide a clear opening width of 32 inches (813 mm). The maximum width of a swinging door leaf shall be 48 inches nominal. *Means of egress* doors in an occupancy in Use Group I-2 used for the movement of beds shall be at least 44 inches (1118 mm) wide. The height of doors shall not be less than 80 inches (2032 mm). For A-2 occupancies where the occupant load is 50 or greater refer to 780 CMR 1006.2.2.1

**Exceptions**:

1. A *means of egress* door serving a storage area of not more than 800 square feet (74 $m^2$) and which is normally unoccupied shall have a maximum width of ten feet (3048 mm).
2. The minimum and maximum width shall not apply to doors that are not required for *means of egress* in occupancies in Use Groups R-2 and R-3.
3. Door openings to resident sleeping rooms in occupancies in Use Group I-3 shall have a clear width of not less than 28 inches (711 mm).
4. Door openings to storage closets less than ten square feet (0.93 $m^2$) in area shall not be limited by the minimum width.
5. Width of door leafs in revolving doors that comply with 780 CMR 1018.0 shall not be limited.
6. Door openings within a *dwelling unit* shall not be less than 78 inches (1981 mm) in height.
7. Exterior door openings in *dwelling units*, other than the required *exit* door, shall not be less than 76 inches (1930 mm) in height.
8. Interior egress doorways within a *dwelling unit* not required to be adaptable or accessible shall have a minimum clear width of 29¾-inches (755 mm).

**1017.4 Door hardware**: Door handles, pulls, latches, locks and other operating devices shall be at a maximum height of 48 inches (1219 mm) above the finished floor. The operating devices shall be capable of operation with one hand and shall not require tight grasping, tight pinching or twisting of

the wrist to operate. All *means of egress* doors shall be of a side-swinging type. All doors shall swing in the direction of egress where serving an occupant

load of 50 or more persons or where serving a high-hazard occupancy. The opening force for interior sideswinging doors without closers shall not exceed a five-pound (24 N) force. For all other side-swinging, sliding and folding doors, the door latch shall release when subjected to a 15-pound (73 N) force. The door shall be set in motion when subjected to a 30-pound (146 N) force. The door shall swing to a full-open position when subjected to a 15-pound (73 N) force. Forces shall be applied to the latch side.

**Exceptions**:

1. Doors to *private garages*, factory and storage areas with an occupant load of ten or less.
2. Horizontal sliding-type doors complying with 780 CMR 410.4.2 shall be permitted in a *means of egress* in occupancies in Use Group I-3.
3. Doors within or serving a single *dwelling unit* which is not required to be accessible or adaptable by 780 CMR 11, are not required to be provided with lever handled operating devices.
4. Revolving doors conforming to 780 CMR 1018.0.
5. Horizontal sliding doors complying with 780 CMR 1017.4.4 shall be permitted in a *means of egress* in areas of refuge as described in 780 CMR 1007.5 and areas, other than high-hazard occupancies, that serve an occupant load of less than 50.

**1017.4.1 Locks and latches**: All *means of egress* doors shall be readily openable from the side from which egress is to be made without the use of a key or special knowledge or effort. ***Refer to M.G.L. c. 143 § 3R for locking devices on the exterior doors of apartment houses.***

**Exceptions**

1. Key operation shall be permitted from a *dwelling unit* provided that the key cannot be removed from the lock when the door is locked from the side from which egress is to be made.
2. Locking devices conforming to 780 CMR 409.3.2 shall be permitted in occupancies in Use Group I-2.
3. Locks conforming to 780 CMR 410.4 shall be permitted in occupancies in Use Group I-3.
4. *Means of egress* doors from individual *dwelling units* and guestrooms of occupancies in Use Group R having an occupant load of ten or less shall be permitted to be equipped with a night latch, dead bolt or security chain, provided that such devices are openable from the inside without the use of a key or tool and are mounted at a height not to exceed 48 inches (1219 mm) above the finished floor.
5. Special locking arrangements conforming to 780 CMR 1017.4.1.2 or 780 CMR 1017.4.1.3.
6. In occupancies in Use Groups B, F, M and S, the main exterior *means of egress* door is permitted to be equipped with a key-operated locking device from the egress side where in compliance with the following three conditions:
   6.1. The locking device is of a type that is readily distinguishable as locked.
   6.2. A readily visible, durable sign is posted on the egress side on or adjacent to the door stating "This Door To Remain Unlocked When This Building Is Occupied." The sign shall be in letters not less than one inch (25 mm) high on a contrasting background.
   6.3. The main exterior door is a single door or a pair of doors which, when unlocked, the door or both leafs of a pair of doors swing free.
7. Locking arrangements conforming to 780 CMR 1017.4.5.
***8. In occupancies in Use Group I-1 and I-2 locks shall be permitted under the following conditions:***
   ***a. Patient sleeping room doors may be provided with key locking devices that restrict access to the room from the corridor and that are openable only by staff from the corridor side, provided such device shall not restrict egress from the sleeping room.***
   ***b. All other means of egress doors may be provided with key locking devices where the clinical needs of the patients require specialized security measures for their safety, or for the protection of the public, provided keys are carried 24 hours per day by staffing at all times, who have been trained in emergency evacuation procedures.***

**1017.4.1.1 Flush and surface bolts**: Manually operated edge or surface-mounted flush bolts and surface bolts are prohibited. Where *means of egress* doors are used in pairs and approved automatic flush bolts are used, the door leafs having the automatic flush bolts shall not have a door knob or surface-mounted hardware. The unlatching of any leaf shall not require more than one operation.

**1017.4.1.2 Special locking arrangements**: In buildings that are equipped throughout with an *automatic sprinkler system* installed in accordance with 780 CMR 906.2.1 or with an automatic fire detection system, doors in a *means of egress* serving occupancies in Use Group B, E, F, I, M, S or R, shall be unlocked or shall be equipped with approved egress control devices which shall unlock in accordance with items 780 CMR 1017.4.1.2.1 through 7. A building occupant shall not be required to pass through more than one door equipped with a special locking device before entering an *exit*.

1. Actuation of the *automatic sprinkler system* or automatic fire detection system.

2. Loss of power to the egress control device.

3. Loss of power to the building.
4. Capability of being unlocked manually by a signal from an *emergency control station*.
5. The initiation of an irreversible and automatic process that will release the latch within 15 seconds when a force of not more than 15 pounds (73 N) is applied for one second to the release device and not relock until the door has been opened and returned to the closed position for not less than 30 seconds. Any reopening of the door shall restart the 30-second relocking cycle. Any attempt to *exit* which exceeds one second shall render the door openable. The time delay and the minimum relocking cycle time shall not be field adjustable.

**Exceptions**:

1. An increase in the time delay to 30 seconds shall not be permitted except as approved by the code official.
2. An increase in the relocking cycle time to 45 seconds shall not be permitted except as approved by the code official.
***3. In Use Group B buildings where one tenant occupies the entire floor and the building has a security station staffed 24 hours each day, the installation of a door release device described in 780 CMR 1017.4.1.2, item 5, may be omitted on egress doors in elevator lobbies provided that all other items in 780 CMR 1017.4.1.2 are met, and in addition, the following items are met:***
***a. The building is equipped throughout with both a supervised automatic fire sprinkler system and a supervised automatic fire alarm system.***
***b. The supervised automatic fire sprinkler system and the supervised fire alarm system shall interface with the access control system to unlock the doors automatically upon activation of either system.***
***c. The elevator lobby shall be equipped with a telephone connected directly to the staffed security station and a sign having block letters one inch in height shall be provided directly above the telephone and shall state: "In case of emergency, pick up telephone. You will be connected directly to security personnel".***

6. Initiation of the irreversible process shall activate an audible alarm in the vicinity of the door.
7. A sign having block letters of one inch (25 mm) in height shall be provided on the door above and within 12 inches (305 mm) of the release device stating "Push until alarm sounds. Door can be opened in 15 seconds."

**1017.4.1.3 Security locking arrangements in penal facilities**: In occupancies in Use Groups A-3, A-4, B, E, F, 1, M and S within penal facilities, doors in *means of egress* serving rooms or spaces occupied by persons whose movements must be controlled for security reasons shall be permitted to be locked if equipped with egress control devices which shall unlock manually and by at least one of the following means.

1. Actuation of an *automatic fire suppression* system required by 780 CMR 904.1.
2. Actuation of a key-operated manual alarm station required by 780 CMR 917.4.
3. A signal from a central control station.

**1017.4.2 Panic hardware**: All doors equipped with latching devices in occupancies in Use Groups A and E or portions of buildings occupied for assembly or educational purposes and serving rooms or spaces with an occupant load greater than 100, shall be equipped with approved panic hardware. Acceptable panic hardware shall be a door latching assembly incorporating a device which causes the door latch to release and the leaf to open when a force of 15 pounds (73 N) is applied in the direction of egress to a bar or panel, the activating portion of which extends not less than one-half of the width of the door leaf, and is applied at a height greater than 30 inches (762 mm) but less than 44 inches (1118 mm) above the floor. The force shall be applied at the lock side of the door or 30 inches (762 mm) from the hinged side, whichever is farther from the hinge. Where *fire door* assemblies are required to have panic hardware, approved fire *exit* hardware shall be used.

**1017.4.3 Power-operated doors**: Where *means of egress* doors are operated by power, such as doors with a photoelectric-actuated mechanism to open the door upon the approach of a person, or doors with power-assisted manual operation, the design shall be such that in the event of power failure, the door is capable of being opened manually to permit *means of egress* travel or closed where necessary to safeguard *means of egress*. The forces required to open these doors manually shall not exceed those specified in 780 CMR 1017.4 except that the force to set the door in motion shall not exceed 50 pounds (244 N). The door shall be capable of swinging from any position to the full width of the opening in which such door is installed when a force is applied to the door on the side from which egress is made.

**Exceptions**:
1. Occupancies in Use Group I-3.
2. Horizontal sliding doors complying with 780 CMR 1017.4.4.

**1017.4.4 Horizontal sliding doors**: In other than occupancies in Use Group H, horizontal sliding doors that are considered a component of a *means of egress* shall comply with all of the following criteria:
1. The door serves an occupant load of less than 50;
2. The door shall be power operated and be capable of being operated manually in the event of power failure;
3. The door shall be openable from both sides without special knowledge or effort;
4. The force required to operate the door shall not exceed 30 pounds (146 N) to set the door in motion and 15 pounds (73 N) to close the door or to open such door to the minimum required width;
5. The door shall be openable with a force not to exceed one ounds (73 N) when a force of 250 pounds (12220 N) is applied perpendicular to the door adjacent to the operating device;
6. The door assembly shall comply with the applicable fire protection rating and, where rated, shall be self-closing or automatic-closing by smoke detection, shall be installed in accordance with NFiPA 80 listed in ***Appendix A***, and shall comply with 780 CMR 716.0;
7. The door assembly shall have a standby power supply;
8. The door shall open to the minimum required width within ten seconds after activation of the operating device; and
9. The door assembly power supply shall be electrically supervised at a constantly attended location.

**1017.4.5 Access-controlled egress doors**: The entrance doors in a *means of egress* in buildings ith an occupancy in Use Group A, B, E, M, R-1 or R-2 and entrance doors to tenant spaces in occupancies in Use Groups A, B, E, M, R-1 and R-2 are permitted to be equipped with an approved entrance and egress access control system which shall be installed in accordance with items 780 CMR 1017.4.5. 1. through 6.
1. A sensor shall be provided on the egress side arranged to detect an occupant approaching the doors. The doors shall be arranged to unlock by a signal from or loss of power to the sensor.
2. Loss of power to that part of the access control system which locks the doors shall automatically unlock the doors.
3. The doors shall be arranged to unlock from a manual unlocking device located 40 inches (1016 mm) to 48 inches (1219 mm) vertically above the floor and within five feet (1524 mm) of the secured doors. Ready access shall be provided to the manual unlocking device and the device shall be clearly identified by a sign. When operated, the manual unlocking 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 a minimum of 30 seconds.
4. Activation of the building fire protective signaling system, if provided, shall automatically unlock the doors, and the doors shall remain unlocked until the fire protective signaling system has been reset.
5. Activation of the building *automatic sprinkler* or fire detection *system*, if provided, shall automatically unlock the doors. The doors shall remain unlocked until the fire protective signaling system has been reset.
6. Entrance doors in buildings with an occupancy in Use Group A, B, E or M shall not be secured from the egress side during periods that the building is open to the general public.

**1017.5 Security grilles**: Horizontal sliding or vertical security grilles which are part of a required *means of egress* shall be openable from the inside without the use of a key or special knowledge or effort during periods that the space is occupied. The grilles shall remain secured in the full-open position during the period of occupancy by the general public. Grilles shall not be brought to the closed position when there are more than ten persons occupying spaces served by a single *exit* or 50 persons occupying spaces served by more than one *exit*. Where two or more exits are required, not more than one-half of the *exits* shall be equipped with horizontal sliding or vertical security grilles.

**1017.6 Level of exit discharge doors**: Where glazed, doors at the *level of exit discharge* shall be glazed with approved safety glazing. Approved doors having one or more unframed edges shall be constructed of safety glazing not less than ½ inch thick. (Also see 780 CMR 2405)

## 780 CMR 1018.0 REVOLVING DOORS

**1018.1 General**: All revolving doors shall comply with 780 CMR 1018.2 through 1018.5. In other than occupancies in Use Group H, revolving doors that are considered a component of the *means of egress* shall comply with 780 CMR 1018.2 through 1018.6.

**1018.2 Collapse**: Each revolving door shall be capable of collapsing into a book-fold position with parallel egress paths having an aggregate width of not less than 36 inches (914 mm). The revolving door shall collapse when a force of not more than 180 pounds (880 N) is applied within 3 inches (76 mm) of the outer edge of a wing.

**Exception**: The maximum collapsing force shall not apply if the force required to collapse the door

1. There is a power failure or power is removed to the device holding the wings in position.
2. There is an actuation of the *automatic sprinkler system* where such system is provided.
3. There is an actuation of an automatic fire detection system installed in accordance with 780 CMR 918.0 for all *areas* within the building which are within 75 feet (22860 mm) of the revolving doors. The collapse of the door(s) shall not be delayed by the *alarm verification* required by 780 CMR 918.7.
4. There is an actuation of a manual control switch which reduces the holding force to not more than the 130-pound (635 N) force level. Such switch shall be in an approved location and shall be clearly identified.

**1018.3 Dispersal area**: A revolving door shall not be located within ten feet (3048 mm) of the foot or top of *stairways* or *escalators*. A dispersal area shall be provided between the *stairways* or *escalators* and the revolving doors.

**1018.4 Speed control**: The revolutions per minute for a revolving door shall not exceed the speeds indicated in Table 1018.4.

**Table 1018.4**
**REVOLVING DOOR SPEED**

| Inside diameter[a] | Power-driven type speed control (rpm) | Manual-type speed control (rpm) |
|---|---|---|
| 6'6" | 11 | 12 |
| 7'0" | 10 | 11 |
| 7'6" | 9 | 11 |
| 8'0" | 9 | 10 |
| 8'6" | 8 | 9 |
| 9'0" | 8 | 9 |
| 9'6" | 7 | 8 |
| 10'0" | 7 | 8 |

**Note a**. 1 foot = 304.8 mm; 1 inch = 25 4 mm.

**1018.5 Adjacent area**: Each revolving door shall have a conforming side-hinged swinging door in the same wall as, and within ten feet (3048 mm) of, the revolving door.

**Exception**: The adjacent swinging door is not required for street floor elevator lobbies if a *stairway*, *escalator* or door from other parts of the building does not discharge through the lobby and the lobby does not have any occupancy other than as a means of travel between the elevators and street.

**1018.6 Means of egress**: A revolving door to be considered as a component of a *means of egress* shall comply with 780 CMR 1018.2 through 1018.5 and the following conditions:

1. Revolving doors shall not be given credit for more than 50% of the required *exit* capacity of the building.
2. Each revolving door shall not be credited with more than a 50-person capacity.
3. Each revolving door shall be capable of being collapsed when a force of not more than 130 pounds (635 N) is applied within three inches (76 mm) of the outer edge of a wing.

## 780 CMR 1019.0 HORIZONTAL EXITS

**1019.1 General**: *Horizontal exits* shall be accepted as an approved exit element of a required *means of egress*. The connection between an area of a building which the *horizontal exit* serves and the area of refuge as herein required shall be accomplished by protected openings in a fireresistance rated wall, or by an open-air balcony or bridge.

**1019.2 Separation**: The separation between buildings or areas of refuge connected by a *horizontal exit* shall be provided by at least a two-hour fireresistance rated *fire wall* or *fire separation assembly* with approved opening protectives complying with 780 CMR 7 and Table 602.

**1019.2.1 Doors**: All doors shall swing in the direction of egress travel. Where the *horizontal exit* serves as an *exit* from both sides of the wall, there shall be adjacent openings with swinging *fire doors* opening in opposite directions.

**Exception**: Horizontal sliding doors complying with 780 CMR 1017.4.4 where serving an occupant load of less than 50.

**1019.3 Area of refuge**: The discharge area of a *horizontal exit* shall be either public areas or spaces occupied by the same tenant, and each such area of refuge shall be adequate to hold the total occupant load of both connected areas. The capacity of areas of refuge shall be computed on a minimum *net floor area* allowance for each occupant to be accommodated therein, not including areas of *stairways*, elevators and other *shafts* or *courts*, as follows:

1. 30 square feet (2.8 $m^2$) per patient for hospitals and nursing homes.
2. Six square feet (0.56 $m^2$) per occupant on stories not housing patients confined to a bed or litter in an occupancy in Use Group I-2.
3. Six square feet (0.56 $m^2$) per occupant in an occupancy in Use Group I-3.
4. Three square feet (0.28 $m^2$) in all other cases.

**1019.4 Egress from area of refuge**: The path of egress travel from the *horizontal exit* through the area of refuge to another *exit* shall be continuously available. In other than occupancies in Use Group I-

3, there shall be at least one *exit* on each side of the *horizontal exit* which is not a *horizontal exit*. Any

area of refuge not having access to an *exit*, other than a *horizontal exit*, shall be considered as part of an adjoining area of refuge with such *exit*. In the area(s) served by the *horizontal exit*, the length of *exit access* travel distance to the *horizontal exit* or another *exit* shall not exceed the requirements of 780 CMR 1006.5. Occupancies in Use Group I-3 shall conform to 780 CMR 410.3.3.

## 780 CMR 1020.0 LEVEL OF EXIT DISCHARGE PASSAGEWAYS USED AS AN EXIT ELEMENT

**1020.1 Passageways**: Every required interior and exterior exit element which does not adjoin a *public way* shall be directly connected to the *public way* or to an open *court* leading to the *public way* by an enclosed passageway at the *level of exit discharge*, constructed in accordance with the requirements for the enclosure of the *exit* it serves, or through lobbies or vestibules as provided for in 780 CMR 1020.0. *Building areas* below the *level of exit discharge* shall be separated from the passageway in accordance with the requirements for the enclosure of *exits*.

**1020.2 Vestibule**: Where an *exit* discharges into an interior vestibule, the vestibule shall be used for ingress and *means of egress* only, and the vestibule shall comply with 780 CMR 1020.2.1 and 1020.2.2.

**1020.2.1 Depth and width**: The vestibule depth from the exterior of the building shall not be greater than ten feet (3048 mm) and the width shall not be greater than 20 feet (6096 mm).

**1020.2.2 Separation**: The vestibule shall be separated from the remainder of the *level of exit discharge* by self-closing doors and the equivalent of ¼-inch-thick wired glass in steel frames.

**1020.3 Lobby**: Where an *exit discharge*s into an interior *lobby* located at the *level of exit discharge*, the story containing the lobby shall be equipped throughout with an *automatic sprinkler system* installed in accordance with 780 CMR 906.2.1 or 906.2.2. Opening protectives shall be required in accordance with Table 716.1 at the point in which an enclosed *exit stairway* discharges into a lobby.

**Exception**: An *automatic sprinkler system* is not required in areas that are separated from the *lobby* by *fire separation assemblies* (see 780 CMR 709.0) having a fireresistance rating of not less than that required for *exit* enclosures.

**1020.4 Width and height**: The clear width of the passageway shall not be less than the width required for the capacity of the *exit stairways* leading thereto and all required *exit* doorways opening into the passageway. Such passageway shall have a minimum width of 44 inches (1118 mm) and a minimum clear ceiling height of eight feet (23438 mm).

**1020.5 Maximum stairway limitations**: Not more than 50% of the required *stairways* shall discharge through the same passageway. Multiple *lobbies* constructed in accordance with 780 CMR 1020.3 located adjacent to one another shall be separated from each other in accordance with the requirements for enclosure of *exits*.

## 780 CMR 1021.0 GUARDS

**1021.1 General**: Where required by the provisions of 780 CMR 406.5, 408.3.2, 1005.5, 1014.7, 1016.5 and 1825.5, guards shall be designed and constructed in accordance with the requirements of 780 CMR 1021.0 and 780 CMR 1615.5. A guardrail system is a system of building components located near the open sides of elevated walking surfaces for the purpose of minimizing the possibility of an accidental fall from the walking surface to the lower level.

**1021.2 Height**: The guards shall be at least 42 inches (1067 mm) in height measured vertically above the leading edge of the tread or adjacent walking surface.

**Exceptions**:

1. In other than occupancies in Use Group E, guards shall not be less than 34 inches (864 mm) in height above the leading edge of the tread along stairs which are not more than 20 feet (6096 mm) in height or which reverse direction at an intermediate landing with 12 inches (305 mm) or less measured horizontally between successive flights.
2. Guards along open-sided floor areas, *mezzanines* and landings in occupancies in Use Group R-3 shall not be less than 36 inches (914 mm) in height.

**1021.3 Opening limitations**: In occupancies in Use Groups A, B, E, H-4, I-1, I-2, M and R, and in *public garages* and open parking structures, open guards shall have balusters or be of solid material such that a sphere with a diameter of four inches (102 mm) cannot pass through any opening. Guards shall not have an ornamental pattern that would provide a ladder effect.

**Exception**: The triangular openings formed by the riser, tread and bottom rail at the open side of a *stairway* shall be of a maximum size such that a sphere six inches (152 mm) in diameter cannot pass through the opening.

In occupancies in Use Groups I-3, F, H-1, H-2, H-3 and S, other than *public garages* and open parking structures, balusters, horizontal intermediate rails or other construction shall not permit a sphere with a diameter of 21 inches (533 mm) to pass through any opening.

**1021.4 Railings**: Metal or other approved noncombustible railings shall be provided on balconies and galleries as prescribed in 780 CMR 1021.4.1 through 1021.4.3.

**1021.4.1 At fascia**: Railings shall be provided: at the fascia of boxes, balconies and galleries and shall not be less than 26 inches (660 mm) in height; at the end of aisles extending to the fascia for the full width of the aisle and shall not be less than 36 inches (914 mm) in height; and at the foot of steps for the full width of the steps and shall not be less than 42 inches (1067 mm) in height.

**1021.4.2 At cross aisles**: Railings shall be provided along cross aisles, and shall not be less than 26 inches (660 mm) in height except that railings are not required where the backs of the seats along the front of the aisles project 24 inches (610 mm) or more above the floor of the aisle.

**1021.4.3 Successive tiers**: Where seatings are arranged in successive tiers, and where the height of rise between platforms exceeds 18 inches (457 mm), railings not less than 26 inches (660 mm) in height shall be provided along the entire row of seats at the edge of the platform.

## 780 CMR 1022.0 HANDRAILS

**1022.1 General**: Where required by the provisions of 780 CMR 1012.5, 1013.0, 1014.6.6.1, 1014.7 and 1016.5, handrails shall be designed and constructed in accordance with 780 CMR 1022.0 and 780 CMR 1615.5. A handrail is a horizontal or sloping rail grasped by hand for guidance or support, and for arresting falls on the adjacent walking surface.

**1022.2 Handrail details**: Handrail-gripping surfaces shall be continuous, without interruption by newel posts, other structure elements or obstructions. A handrail and any wall or other surface adjacent to the handrail shall be free of any sharp or abrasive elements. The clear space between the handrail and the adjacent wall or surface shall not be less than 1½ inches (38 mm). Edges shall have a minimum radius of _ inch (3 mm).

**1022.2.1 Projection**: Handrails shall not project more than 3½ inches (89 mm) into the required passageway, aisle, *corridor*, stair or ramp width.

**1022.2.2 Height**: Handrails shall not be less than 34 inches (864 mm) nor more than 38 inches (965 mm), measured vertically, above the leading edge of the treads or above the finished floor of the landing or walking surfaces.

**Exceptions**:

1. Handrails that form part of a guard shall have a height not less than 34 inches (864 mm) and not more than 42 inches (1067 mm).
2. Handrails within individual *dwelling units* shall not be less than 30 inches (762 mm) nor more than 38 inches (965 mm), measured vertically, above the leading edge of the treads or above the finished floor.

**1022.2.3 Handrails in guards**: Handrails that form part of a guard shall comply with 780 CMR 1021.3.

**1022.2.4 Handrail ends**: At locations where handrails are not continuous between *stairway* flights, including the top and bottom of a *stairway*, the handrails shall extend horizontally at least 12 inches (305 mm) beyond the top riser and continue to slope for the depth of one tread beyond the bottom riser. The handrail ends shall be returned to a wall or post.

Where handrails are not continuous between ramp segments, including the top and bottom of a ramp, the handrails shall extend at least 12 inches (305 mm) beyond the top and bottom of the ramp segment and shall be parallel with the floor or ground surface. The handrail ends shall be returned to a wall or post.

**Exception**: Within a *dwelling unit*, the horizontal extension beyond the top riser of the *stairway* flight or top of the ramp segment, and the extension beyond the bottom riser of the *stairway* flight or bottom of the ramp segment, is not required.

**1022.2.5 Handrail grip size**: All *stairway* handrails shall have a circular cross section with an outside diameter of at least 1¼-inches (32 mm) and not greater than two inches (51 mm).

**Exceptions**:

1. Any other shape with a perimeter dimension of at least four inches (100 mm), but not greater than 6¼ inches (158 mm) with the largest cross-sectional dimension not exceeding 2¼ inches (57 mm).
2. Approved rails of equivalent graspability.

**1022.2.6 Handrails of alternating tread stairways**: Stair handrails of *alternating tread stairways* shall be of such a configuration as to provide an adequate hand-hold for a person grasping the handrail to avoid falling. A minimum distance of six inches (152 mm) shall be provided between the stair handrail and any other object. A minimum distance of 12 inches (305 mm) shall be provided between the stair handrails of adjacent *alternating tread stairways*. Handrails on *alternating tread stairways* shall be spaced a minimum width of 17 inches (432 mm), not to exceed 24 inches (610 mm), between the handrails.

## 780 CMR 1023.0 EXIT SIGNS AND LIGHTS

**1023.1 Location**: In all buildings, rooms or spaces required to have more than one *exit* or *exit access*, all required *means of egress* shall be indicated with approved signs reading "Exit," visible from the *exit access* and, where necessary, supplemented by directional signs in the *exit access corridors*

indicating the direction and way of egress. All "Exit" signs shall be located at *exit* doors or *exit access* areas, so as to be readily visible. Sign placement shall be such that any point in the *exit access* shall not be more than 100 feet (30480 mm) from the nearest visible sign.

**Exceptions**:

1. "Exit" signs are not required in sleeping room areas in occupancies in Use Group I-3.
2. Main exterior *exit* doors which are obviously and clearly identifiable as *exits* are not required to have "Exit" signs where approved.

**1023.2 Size and color**: "Exit" signs shall have red or green letters at least six inches (152 mm) high and the minimum width of each stroke shall be ¾ inch (19 mm) on a white background or in other approved distinguishable colors. The word "Exit," except the letter I, shall have letters having a width of not less than two inches (51 mm) and the minimum spacing between letters shall not be less than _ inch (10 mm). Signs larger than the minimum size herein required shall have letter widths and spacing in the same proportions to the height as indicated in 780 CMR 1023.0. If an arrow is provided as part of an "Exit" sign, the construction shall be such that the arrow direction cannot be readily changed. The word "Exit" shall be clearly discernible when the sign illumination means is not energized.

***Exception: All exit signs tested and listed to UL-924 as listed in Appendix A and satisfying the power source requirements of 780 CMR 1023.4 shall be permitted***.

**1023.3 Illumination**: Each sign shall be illuminated by a source providing not less than five footcandles (54 lux) at the illuminated surface and shall have a contrast ratio of not less than 0.5.

**Exception**: Approved self-luminous signs which provide evenly illuminated letters shall have a minimum luminance of 0.06 foot lamberts (0.21 $cd/m^2$).

**1023.4 Power source**: All "Exit" signs shall be illuminated at all times that the building is occupied. To assure continued illumination for a duration of not less than 1½ hours in case of primary power loss, the "Exit" signs shall be connected to an emergency electrical system that complies with ***527 CMR 12.00, the Massachusetts Electrical Code, referenced in 780 CMR 27, and listed in Appendix A.***

**Exceptions**:

1. Approved self-luminous signs which provide continuous illumination independent of external power sources are not required to comply with 780 CMR 2706.0.

***2. All exit signs tested and listed to UL-924 as listed in Appendix A and satisfying the power source requirements of 780 CMR 1023.4 shall be permitted***.

## 780 CMR 1024.0 MEANS OF EGRESS LIGHTING

**1024.1 Artificial lighting**: All *means of egress* in other than occupancies in Use Group R-3 shall be equipped with artificial lighting facilities to provide the intensity of illumination herein prescribed continuously during the time that conditions of occupancy of the building require that the *exits* be available. Lighting shall also be provided to illuminate the *exit discharge*. *Means of egress* lighting in occupancies in Use Group R-2, other than lighting within a *dwelling unit*, shall be wired on a circuit independent of circuits within any *dwelling unit*. The disconnecting means and overcurrent protection device shall not be located within a *dwelling unit* or such that access to such devices must be obtained by going through a *dwelling unit*.

**1024.2 Intensity of illumination**: The intensity of floor lighting shall not be less than one footcandle (11 lux) except as provided for in 780 CMR 1024.3.

**1024.3 Use Groups A and E**: In occupancies in Use Groups A and E for the exhibition of motion pictures or other projections by means of directed light, the minimum required illumination of aisles during such period of projection shall be 0.2 footcandle (2 lux).

**1024.3.1 Control**: The lighting of *exits*, aisles and auditoriums shall be controlled from a location that does not provide access to unauthorized persons. Supplementary control shall be provided as specified in 780 CMR 411.4 in the motion picture projection room.

**1024.4 Power source**: *Means of egress* lighting in all buildings, rooms or spaces required to have more than one *exit* or *exit access* shall be connected to an emergency electrical system that complies with ***527 CMR 12.00, the Massachusetts Electrical Code, referenced in 780 CMR 27, and listed in Appendix A*** to assure continued illumination for a duration of not less than 1½ hours in case of emergency or primary power loss.

## 780 CMR 1025.0 FIRE ESCAPES

**1025.1 Where permitted**: Fire escapes shall be permitted only as provided for in 780 CMR 1025.1.1 through 1025.1.4.

**1025.1.1 New buildings**: Fire escapes shall not constitute any part of the required *means of egress* in new buildings.

**1025.1.2 Existing fire escapes**: Existing fire escapes shall be continued to be accepted as a component in the *means of egress* in existing buildings only.

**1025.1.3 New fire escapes**: New fire escapes for existing buildings shall be permitted only where exterior stairs cannot be utilized due to *lot lines* limiting stair size or due to the sidewalks, alleys or roads at grade level. New fire escapes shall not incorporate ladders or access by windows.

**1025.1.4 Limitations**: Fire escapes shall comply with 780 CMR 1025.0 and shall not constitute more than 50% of the required number of *exits* nor more than 50% of the required *exit* capacity.

**1025.2 Location**: Where located on the front of the building and where projecting beyond the building line, the lowest landing shall not be less than seven feet (2134 mm) or more than 12 feet (3658 mm) above grade, and shall be equipped with a counterbalanced *stairway* to the street. In alleyways and thoroughfares less than 30 feet (9144 mm) wide, the clearance under the lowest landing shall not be less than 12 feet (3658 mm).

**1025.3 Construction**: The fire escape shall be designed to support a *live load* of 100 pounds per square foot (488.20 kg/m$^2$) and shall be constructed of steel or other approved noncombustible materials. Fire escapes constructed of wood not less than nominal two inches thick are permitted on buildings of Type 5 construction. Walkways and railings located over or supported by combustible roofs in buildings of Types 3 and 4 construction are permitted to be of wood not less than nominal two inches thick.

**1025.3.1 Dimensions**: Stairs shall be at least 22 inches (559 mm) wide with risers not more than, and treads not less than, eight inches (203 mm) and landings at the foot of stairs not less than 40 inches (1016 mm) wide by 36 inches (914 mm) long, located not more than eight inches (203 mm) below the door.

**1025.3.2 Opening protectives**: Doors and windows along the fire escape shall be protected with ¾-hour opening protectives.

## 780 CMR 1026.0 SLIDESCAPES

**1026.1 Where permitted**: Existing slidescapes and safety chutes shall be permitted in existing occupancies in Use Groups E, H and I where approved. Slidescapes and safety chutes shall be permitted in occupancies in Use Groups H-1 and H-2 where constructed in an approved manner.

**1026.2 Location**: The arrangement and location of slidescapes shall conform to 780 CMR 10 for *means of egress* and shall be designated by "Exit" signs and lights as provided for in 780 CMR 1023.0.

**1026.3 Construction**: All chutes shall be constructed of approved noncombustible materials with a pitch in the line of travel of not less than 24 nor more than 42° (0.42 rad to 0.73 rad), measured on the developed circumference of spiral chutes. Straight chutes shall not be less than 24 inches (610 mm) and spiral chutes shall not be less than 28 inches (711 mm) in clear width; nor more than 44 inches (1118 mm) wide in any case. Where erected on the interior of a building, the chutes shall be enclosed as required in 780 CMR 1014.11 for interior *stairways* with direct *means of egress* to a street or other *public way*.

**1026.4 Capacity**: Slidescapes shall have a rated egress capacity of 60 occupants per slide. Slidescapes, except as permitted for occupancies in Use Groups H-1 and H-2, shall not constitute more than 25% of the required *means of egress* capacity from any building or structure or any individual story.

## 780 CMR 1027.0 ACCESS TO ROOF

**1027.1 By stairway or ladder**: In buildings more than three stories in *height* except those with a roof slope greater than four units vertical in 12 units horizontal (4:12). access to the roof shall be provided by means of a *stairway*, an *alternating tread stair* in accordance with 780 CMR 1014.6.6 or a ladder and trap door. The ladder shall not be on the exterior of the building. Where the roof is used as a roof garden or for other habitable purposes, sufficient *stairways* shall extend to the roof to provide the necessity *exit* facilities from the roof as required for such occupancy. Roof trap doors shall be constructed to comply with 780 CMR 1510.2.

**1027.1.1 Optional stairway or ladder**: In buildings not required to have a *stairway*, *alternating tread stair* or ladder to the roof, such devices, if provided, shall conform to the provisions of 780 CMR 1027.0. Ladders placed on the exterior of the building shall be of metal and, if exceeding 20 feet (6096 mm) in height, shall have a protective cage or other safety device. The siderails of exterior ladders shall be carried over the coping or parapet to serve as handrails. Other design details of such exterior ladders are subject to approval.

**1027.2 Roof enclosures**: *stairways* extending through roofs shall be enclosed in roof structures of fireresistance rated construction which conform to the requirements of 780 CMR 1510.0.

## 780 CMR 1028.0 MAINTENANCE OF EXITS

**1028.1 Obstructions**: It shall be unlawful to obstruct, or reduce in any manner, the clear width of any doorway, hallway, passageway or other *means of egress* required by the provisions of 780 CMR.

**1028.2 Maintenance**: All exterior *stairways* and fire escapes shall be kept free of snow and ice. Exterior *stairways* and fire escapes constructed of materials requiring the application of weather protecting products, shall have these products applied in an approved manner and shall be applied as often as necessary to maintain the *stairways* and fire escapes in safe condition ***where corrodible structural parts of such stairways and fire escapes tie directly into the building structural system, all joints shall be sealed, as necessary, to prevent water from damaging or corroding structural elements.***

***1028.3 Testing and Certification: All exterior bridges, steel or wooden stairways, fire escapes and egress balconies shall be examined and/or tested, and certified for structural adequacy and safety every five years, by a Massachusetts registered professional engineer, or others qualified and acceptable to the building official; said engineer or others shall then submit an affidavit to the building official.***

NON-TEXT PAGE