

## SECTION 1007 STAIRWAY CONSTRUCTION

### 1007.1 General

**1007.1.1** Exterior and interior exit stairways shall be constructed of noncombustible materials throughout in the following buildings:

1. All buildings of Type I and of Type II construction.
2. All Group A-1 and Group I buildings.
3. All other buildings three stories or more in height or occupied by more than 40 persons above or below the level of exit discharge.

**Exception to item 3:** R3 occupancies and buildings of Type VI construction.

**1007.1.2** Stairways located in a required fire resistant enclosure shall have closed risers. All other stairways shall be permitted to have open risers.

**1007.1.3** Interior stairs constructed of wood, except those with open risers, shall be fireblocked as specified in 705.3.

**Exception:** Protection is not required for those stairways exempted from enclosure in 1006.1.1.

**1007.1.4** The underside of interior stairways, if of combustible construction, shall be protected to provide not less than 1-hour fire resistance.

**Exception:** When located within a dwelling unit.

**1007.1.5** Enclosed exit stairways that continue beyond the floor of discharge shall be interrupted at the floor of discharge by partitions, doors or other effective means.

**Exception:** Stairs that continue  $\frac{1}{2}$  story beyond the level of exit discharge need not be interrupted by physical barriers where the exit discharge is clearly obvious.

**X 1007.2 Accessible Stairs.** Stairs required to be accessible by 11-4.1 shall comply with 11-4.9. Floor surfaces of stairs along accessible routes and in accessible rooms and spaces shall comply with 11-4.5.

### 1007.3 Treads and risers

**1007.3.1** Risers shall be a maximum height of 7 in. (17.8 cm) and a minimum height of 4 in. (10.2 cm). Treads shall be a minimum of 11 in.

#### Exceptions:

1. In one- and two-family dwellings and within dwelling units, treads and risers of stairs shall be permitted to be so proportioned that the sum of two risers and a tread, exclusive of projection of nosing, is not less than 24 inches (610 mm) nor more than 25 inches (635 mm). The height of risers shall not exceed  $7\frac{3}{4}$  inches (197 mm), and treads, exclusive of nosing, shall be not less than 9 inches (229 mm) wide. Every tread less than 10 inches (254 mm) wide shall have a nosing, or effective projection, of

approximately 1 inch (25.4 mm) over the level immediately below that tread.

2. Special stairs in 1007.8.
3. Industrial equipment access stairs and landings that serve as a component of the means of egress from the involved equipment and do not serve more than 20 people shall be permitted to have a minimum clear width of 22 in. (55.9 cm), minimum tread depth of 10 in. (25.4 cm), maximum riser height of 9 in. (22.9 cm), minimum headroom of 6 ft 8 in. (203 cm), and a maximum height between landings of 12 ft.
4. As permitted at 1019.10.5 and 1019.11.7.

**1007.3.2** Riser height shall be measured as the vertical distance between tread nosings. Tread depth shall be measured horizontally between the vertical planes of the foremost projection of adjacent treads and at a right angle to the tread's leading edge, but shall not include beveled or rounded tread surfaces that slope more than 20 degrees (a slope of 2 in 2.75). At tread nosings, such beveling or rounding shall not be more than 12 in. (1.3 cm) in horizontal dimension.

**Exception:** Tread depth of special stairs in 1007.8 shall be measured on a line perpendicular to the centerline of tread.

**1007.3.3** Treads shall be of uniform depth and risers of uniform height in any stairway between two floors. There shall be no variation exceeding  $\frac{3}{16}$  inch (4.8 mm) in the depth of adjacent treads or in the height of adjacent risers and the tolerance between the largest and smallest riser or between the largest and smallest tread shall not exceed  $\frac{3}{8}$  inch (9.5 mm) in any flight. The uniformity of winders and other tapered treads complying with 1007.8.1, 1007.8.2 and 1007.8.3 shall be measured at consistent distances from the narrower end of the treads.

**Exception:** Where the bottom or top riser adjoins a sloping public way, walk or driveway having an established grade and serving as a landing, a variation in height of the riser of not more than 3 inches (76 mm) for every 3 ft (914 mm) of stairway width is permitted.

**1007.3.4** Tread slope shall not be more than  $\frac{1}{4}$  in. per ft (2 cm per m).

### 1007.4 Landings

**1007.4.1** A flight of stairs shall not have a vertical rise of more than 12 ft (3658 mm) between floors or landings.

**1007.4.2** Stairs shall have floors or landings at door openings. Stairs and intermediate landings shall continue with no decrease in width along the direction of egress travel. The width of landings shall be not less than the width of stairways they serve. Every landing shall have a minimum dimension measured in the direction of travel equal to the width of the stairway.

**Exceptions:**

1. Landings shall be permitted to be not more than 4 ft (122 cm) in the direction of travel provided the stair has a straight run.
2. In one- and two-family dwellings, a door at the top of a stair shall be permitted to open directly at a stair provided the door does not swing over the stair and the door serves an area with an occupant load of fewer than 50 persons.

**1007.4.3** Stairway landings shall have guardrails as specified in 1015 on any open and unenclosed edges.

### 1007.5 Handrails

**1007.5.1** Stairways shall be equipped with handrails located not less than 34 inches (864 mm) nor more than 38 inches (965 mm) above the leading edge of a tread.

#### Exceptions:

1. Handrails for stairs not required to be accessible that form part of a guardrail may be 42 inches (1067 mm) high.
2. As required for Group I Unrestrained in 1024.1.4.
3. In one- and two-family dwellings and within dwelling units in R2 occupancies, stairways having four or more risers above a floor or finished ground level shall be equipped with handrails located not less than 34 inches (864 mm) nor more than 38 inches (965 mm) above the leading edge of a tread.

**1007.5.2** Stairways shall have handrails on each side.

#### Exceptions:

1. Aisle stairs provided with a center handrail need not have additional handrails.
2. Stairs within dwelling units and aisle stairs serving seating on only one side may have a handrail on one side only.
3. Spiral stairs shall be provided with handrails in accordance with 1007.8.2.

**1007.5.3** Handrails shall have either a circular cross section with a diameter of 1<sup>1</sup>/<sub>4</sub> inches (32 mm) to 2 inches (51 mm) or a noncircular cross section with a perimeter dimension of at least 4 inches (102 mm) but not more than 6<sup>1</sup>/<sub>4</sub> inches (159 mm) and a largest cross section dimension not exceeding 2<sup>1</sup>/<sub>4</sub> inches (57 mm). Edges shall have a minimum radius of 1/8 inch (3 mm).

**Exception:** Handrails for dwellings or within dwelling units shall have a circular cross section with a diameter of 1<sup>1</sup>/<sub>4</sub> inches (32 mm) to 2 inches (51 mm), or provide a noncircular cross section with equivalent graspability performance.

**1007.5.4** Gripping surfaces shall be continuous, without interruption by newel posts or other obstructions.

#### Exceptions:

1. Handrails within dwelling units shall be permitted to be interrupted by a newel post at a turn.
2. In dwelling units, the use of a volute, turnout or starting easing shall be allowed over the lowest tread.
3. Handrail brackets or balusters attached to the bottom surface of the handrail shall not be considered to be obstructions to graspability, provided that the following conditions are met:
  - (1) They do not project horizontally beyond the sides of the handrail within 1<sup>1</sup>/<sub>2</sub> in. (3.75 cm) of the bottom of the handrail and provided that, for each 1/2 in. (1.3 cm) of additional handrail perimeter dimension above 4 in. (10 cm), the vertical clearance dimension of 1<sup>1</sup>/<sub>2</sub> in. (3.15 cm) can be reduced by 1/8 in. (0.3 cm).
  - (2) They have edges with a radius of not less than 1/8 in. (0.3 cm).
  - (3) They obstruct not in excess of 20 percent of the handrail length.

**1007.5.5** Handrails shall extend at least 12 inches (305 mm) horizontally beyond the top riser of a flight. At the bottom, the handrail shall continue to slope for a distance of the depth of one tread from the bottom riser.

#### Exceptions:

1. Handrails within a dwelling unit.
2. Continuous handrails at the inside turn of stairs.

**1007.5.6** Clear space between handrail and wall shall be a minimum of 1<sup>1</sup>/<sub>2</sub> inches (38 mm).

**1007.5.7** Handrails shall be provided within 30 inches (762 mm) of all portions of the stair width required for egress capacity in accordance with Table 1004. The required egress width shall be along the natural path of travel.

**1007.5.8** Handrails, where required along open-sided flights of stairs, shall be of construction adequate in strength, durability and attachment for their purposes as prescribed in 1608.2.

**X 1007.5.9** For provisions related to handrails on stairs which are required to be accessible, refer to 11-4.9.1, 11-4.9.4, and 11-4.26.

### 1007.6 Width

**1007.6.1** Stairs shall be clear of all obstructions except projections not exceeding 3<sup>1</sup>/<sub>2</sub> inches (89 mm) at or below handrail height on each side.

**1007.6.2** Width of stairs shall not decrease in the direction of exit travel.

**1007.6.3** The minimum width of any stair serving as a means of egress shall be in accordance with Table 1004.

**1007.7 Headroom.** Stairs shall have a minimum headroom clearance of 6 ft 8 inches (2032 mm) measured vertically from a line connecting the edge of the nosings. Such headroom shall be continuous above the stair to the point where the line intersects the landing below, one tread depth beyond the bottom riser. This minimum shall be maintained the full width of the stair and landing. (See 1007.3.1 for industrial stairs.)

### 1007.8 Special stairs

**1007.8.1** Winders shall have a minimum tread depth of 6 inches (152 mm) at the narrow edge and shall have a minimum tread depth of 11 inches (279 mm) at a point 12 inches (305 mm) from the narrow edge. Winders shall be permitted to be used as a component in the means of egress within a dwelling unit.

**1007.8.2 Spiral Stairways.** Where permitted by this section or in specific occupancies in accordance with 1018, spiral stairs complying with this section shall be permitted as a component in a means of egress.

**1007.8.2.1** Spiral stairs complying with the following shall be permitted:

1. Riser heights shall not exceed 7 in. (17.8 cm).
2. The stairway shall have a tread depth of not less than 11 in. (27.9 cm) for a portion of the stairway width sufficient to provide the egress capacity for the occupant load served in accordance with 1003.1.
3. At the outer side of the stairway, an additional 10-1/2 in. (26.7 cm) of width shall be provided clear to the other handrail, and this width shall not be included as part of the required egress capacity.
4. Handrails complying with 1007.5 shall be provided on both sides of the spiral stairway.
5. The inner handrail shall be located within 24 in. (61 cm), measured horizontally, of the point where a tread depth not less than 11 in. (27.9 cm) is provided.
6. The turn of the stairway shall be such that descending users have the outer handrail at their right side.

**1007.8.2.2** Where the occupant load served does not exceed three and from mezzanines not exceeding 250 sq ft. (23 m<sup>2</sup>) and an occupant load of three or less, spiral stairs meeting the following conditions shall be permitted.

1. The clear width of the stairs shall be not less than 26 in. (66 cm).
2. The height of the risers shall not exceed 9 1/2 in. (24.1 cm).
3. Headroom shall be not less than 6 ft 6 in. (198 cm).
4. Treads shall have a depth not less than 7 1/2 in. (19.1 cm) at a point 12 in. (30.5 cm) from the narrower edge.
5. All treads shall be identical.

6. Handrails complying with 1007.5 shall be provided on both sides of the spiral stairway.

**1007.8.2.3** Within dwellings and dwelling units, guest rooms and guest suites where the occupant load served does not exceed five, spiral stairs meeting the following conditions shall be permitted:

1. The minimum stairway width shall be 26 inches (660 mm).
2. The height of risers shall not be more than 9 1/2 inches (241 mm).
3. The headroom shall be a minimum of 6 ft 6 in. (1981 mm).
4. Treads shall have a depth not less than 7 1/2 in. (190 mm) at a point 12 inches (305 mm) from the narrow edge.
5. All treads shall be identical.
6. Handrails shall be provided on one side.

**1007.8.3** Circular stairways shall be permitted to be used as a component in the means of egress providing the minimum depth of tread is not less than 11 inches (279 mm) measured 12 inches (305 mm) from the smaller radius, and the smaller radius is not less than twice the width of the stairway. In Group R3 Occupancies, circular stairs may have a minimum tread depth of 9 inches (229 mm) with 1 inch (25.4 mm) of nosing, and the smaller radius may be less than twice the width of the stairway.

**1007.8.4** Alternating tread stairways shall have a minimum projected tread exclusive of nosing of 8 1/2 inches (216 mm) within a minimum total tread depth of 10 1/2 inches (267 mm). The rise to the next alternating tread surface shall be a maximum of 8 inches (203 mm). Distance between handrails shall be a minimum of 17 inches (432 mm) and a maximum of 24 inches (610 mm). A minimum distance of 6 inches (152 mm) shall be provided between the stair handrail and any other object. A minimum of 12 inches (305 mm) shall be provided between the stair handrails of adjacent alternating tread stairways.

**1007.8.5** Alternating tread stairways meeting the requirements of 1007.8.4 shall be permitted to be used as a component in a means of egress from a mezzanine of not more than 250 sq ft (23 m<sup>2</sup>) in area serving not more than 3 occupants in F, H, I, within dwelling units of R2 and R3 and S occupancies.