



**Note: The Following Information is for General Information and shouldn't be used as a Total list of Codes References.**

### **311.7 Stairways.**

#### **311.7.1 Width.**

Stairways shall be not less than 36 inches (914 mm) in clear width at all points above the permitted handrail height and below the required headroom height. The clear width of stairways at and below the handrail height, including treads and landings, shall be not less than 31½ inches (787 mm) where a handrail is installed on one side and 27 inches (698 mm) where handrails are installed on both sides.

**Exception:** The width of spiral stairways shall be in accordance with Section 311.7.10.1.

#### **311.7.2 Headroom.**

The headroom in stairways shall be not less than 6 feet 8 inches (2032 mm) measured vertically from the sloped line adjoining the tread nosing or from the floor surface of the landing or platform on that portion of the stairway.

#### **Exceptions:**

1. 1. Where the nosings of treads at the side of a flight extend under the edge of a floor opening through which the stair passes, the floor opening shall not project horizontally into the required headroom more than 4¾ inches (121 mm).
2. 2. The headroom for spiral stairways shall be in accordance with Section 311.7.10.1.

#### **311.7.3 Vertical rise.**

A flight of stairs shall not have a vertical rise larger than 148½ inches (3772 mm) between floor levels or landings.

#### **311.7.4 Walkline.**

The walkline across winder treads and landings shall be concentric to the turn and parallel to the direction of travel entering and exiting the turn. The walkline shall be located 12 inches (305 mm) from the inside of the turn. The 12-inch (305 mm) dimension shall be measured from the widest point of the clear stair width at the walking surface. Where winders are adjacent within a flight, the point of the widest clear stair width of the adjacent winders shall be used.

#### **311.7.5 Stair treads and risers.**

Stair treads and risers shall meet the requirements of this section. For the purposes of this section, dimensions and dimensioned surfaces shall be exclusive of carpets, rugs or runners.

### **311.7.5.1 Risers.**

The riser height shall be not more than 8  $\frac{1}{4}$  -inches (209 mm). The riser shall be measured vertically between leading edges of the adjacent treads. The greatest riser height within any flight of stairs shall not exceed the smallest by more than  $\frac{3}{8}$  inch (9.5 mm). Risers shall be vertical or sloped from the underside of the nosing of the tread above at an angle not more than 30 degrees (0.51 rad) from the vertical. At open risers, openings located more than 30 inches (762 mm), as measured vertically, to the floor or grade below shall not permit the passage of a 4-inch-diameter (102 mm) sphere.

#### **Exceptions:**

1. The opening between adjacent treads is not limited on spiral stairways.
2. The riser height of spiral stairways shall be in accordance with Section 311.7.10.1.

### **311.7.5.2 Treads.**

The tread depth shall be not less than 9-inches (229 mm). The 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. The greatest tread depth within any flight of stairs shall not exceed the smallest by more than  $\frac{3}{8}$  inch (9.5 mm).

### **311.7.5.3 Nosings.**

Nosings at treads, landings and floors of stairways shall have a radius of curvature at the nosing not greater than  $\frac{9}{16}$  inch (14 mm) or a bevel not greater than  $\frac{1}{2}$  inch (12.7 mm). A nosing projection not less than  $\frac{3}{4}$  inch (19 mm) and not more than 1  $\frac{1}{4}$  inches (32 mm) shall be provided on stairways. The greatest nosing projection shall not exceed the smallest nosing projection by more than  $\frac{3}{8}$  inch (9.5 mm) within a stairway.

**Exception:** A nosing projection is not required where the tread depth is not less than 11 inches (279 mm).

### **311.7.5.4 Exterior plastic composite stair treads.**

Plastic composite exterior stair treads shall comply with the provisions of this section and Section 507.2.2.

### **311.7.6 Landings for stairways.**

There shall be a floor or landing at the top and bottom of each stairway. The width perpendicular to the direction of travel shall be not less than the width of the flight served. For landings of shapes other than square or rectangular, the depth at the walk line and the total area shall be not less than that of a quarter circle with a radius equal to the required landing width. Where the stairway has a straight run, the depth in the direction of travel shall be not less than 36 inches (914 mm).

**Exception:** A floor or landing is not required at the top of an interior flight of stairs, including stairs in an enclosed garage, provided that a door does not swing over the stairs.

### **311.7.7 Stairway walking surface.**

The walking surface of treads and landings of stairways shall be sloped not steeper than one unit vertical in 48 inches horizontal (2-percent slope).

### **311.7.8 Handrails.**

Handrails shall be provided on not less than one side of each flight of stairs with four or more risers.

### 311.7.8.1 Height.

Handrail height, measured vertically from the sloped plane adjoining the tread nosing, or finish surface of ramp slope, shall be not less than 34 inches (864 mm) and not more than 38 inches (965 mm)

#### Exceptions:

1. The use of a volute, turnout or starting easing shall be allowed over the lowest tread.
2. Where handrail fittings or bendings are used to provide continuous transition between flights, transitions at winder treads, the transition from handrail to guard, or used at the start of a flight, the handrail height at the fittings or bendings shall be permitted to exceed 38 inches (956 mm).

### 311.7.8.2 Handrail projection.

Handrails shall not project more than 4½ inches (114 mm) on either side of the stairway.

**Exception:** Where nosings of landings, floors or passing flights project into the stairway reducing the clearance at passing handrails, handrails shall project not more than 6½ inches (165 mm) into the stairway, provided that the stair width and handrail clearance are not reduced to less than that required.

### 311.7.8.3 Handrail clearance.

Handrails adjacent to a wall shall have a space of not less than 1½ inches (38 mm) between the wall and the handrails.

### 311.7.8.4 Continuity.

Handrails shall be continuous for the full length of the flight, from a point directly above the top riser of the flight to a point directly above the lowest riser of the flight. Handrail ends shall be returned or shall terminate in newel posts or safety terminals.

#### Exceptions:

1. Handrail continuity shall be permitted to be interrupted by a newel post at a turn in a flight with winders, at a landing, or over the lowest tread.
2. A volute, turnout or starting easing shall be allowed to terminate over the lowest tread.
3. *Two or more separate rails shall be considered continuous if the termination of the rails occurs over a single tread and positioned within 4 inches of each other. If the transition occurs between a wall mounted handrail and handrail/guardrail combination, the wall mounted handrail shall return into the wall.*

### 311.7.8.5 Grip size.

Required handrails shall be of one of the following types or provide equivalent graspability.

- 1.1. **Type I.** Handrails with a circular cross section shall have an outside diameter of not less than 1¼ inches (32 mm) and not greater than 2 inches (51 mm). If the handrail is not circular, it shall have a perimeter of not less than 4 inches (102 mm) and not greater than 6¼ inches (160 mm) and a cross section of not more than 2¼ inches (57 mm). Edges shall have a radius of not less than 0.01 inch (0.25 mm).
- 2.2. **Type II.** Handrails with a perimeter greater than 6¼ inches (160 mm) shall have a graspable finger recess area on both sides of the profile. The finger recess shall begin within ¾ inch (19 mm) measured vertically from the tallest portion of the profile and have

a depth of not less than  $\frac{5}{16}$  inch (8 mm) within  $\frac{7}{8}$  inch (22 mm) below the widest portion of the profile. This required depth shall continue for not less than  $\frac{3}{8}$  inch (10 mm) to a level that is not less than  $1\frac{3}{4}$  inches (45 mm) below the tallest portion of the profile. The width of the handrail above the recess shall be not less than  $1\frac{1}{4}$  inches (32 mm) and not more than  $2\frac{3}{4}$  inches (70 mm). Edges shall have a radius of not less than 0.01 inch (0.25 mm).

### **311.7.8.6 Exterior plastic composite handrails.**

Plastic composite exterior handrails shall comply with the requirements of Section 507.2.2.

## **Guards**

### **312.1.1 Where required.**

Guards shall be provided for those portions of open-sided walking surfaces, including stairs, ramps and landings, that are located more than 30 inches (762 mm) measured vertically to the floor or grade below at any point within 36 inches (914 mm) horizontally to the edge of the open side. Insect screening shall not be considered as a guard.

*Exception: Guards are not required where a protective bar is installed 34 inches to 38 inches (864 mm to 965 mm) above the porch or deck on the interior side of the screening. The protective bar shall be capable of resisting a horizontal load of 50 pounds per lineal foot (730 N/m) without contacting the screen and be a minimum of  $1\frac{1}{2}$  inches (38 mm) in height.*

### **312.1.2 Height.**

Required guards at open-sided walking surfaces, including stairs, porches, balconies or landings, shall be not less than 36 inches (914 mm) in height as measured vertically above the adjacent walking surface or the line connecting the nosings.

#### **Exceptions:**

1. Guards on the open sides of stairs shall have a height of not less than 34 inches (864 mm) measured vertically from a line connecting the nosings.
2. Where the top of the guard serves as a handrail on the open sides of stairs, the top of the guard shall be not less than 34 inches (864 mm) and not more than 38 inches (965 mm) as measured vertically from a line connecting the nosings.

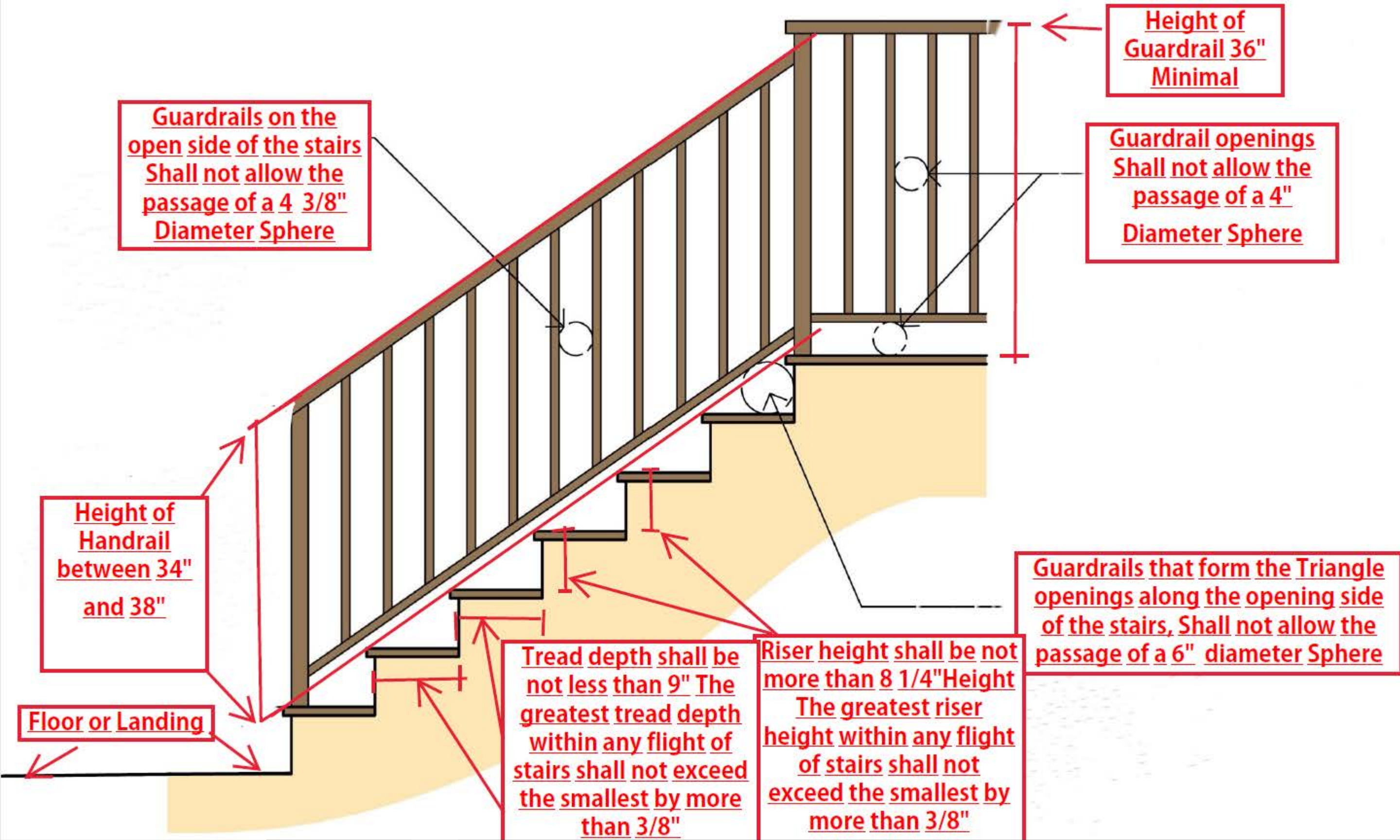
### **312.1.3 Opening limitations.**

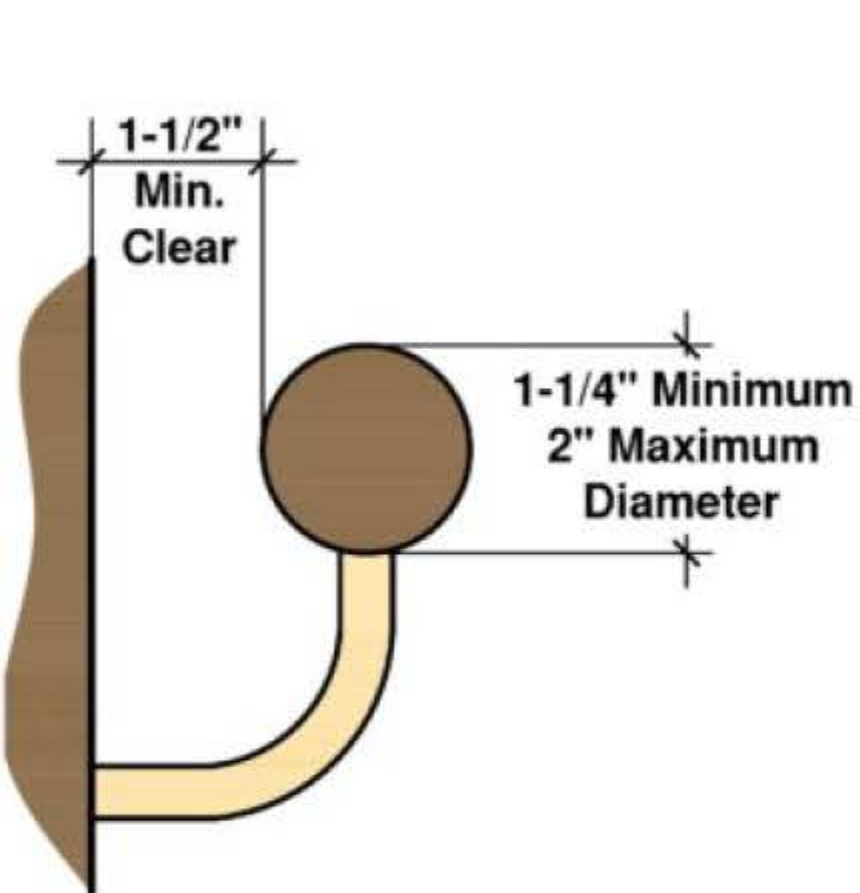
Required guards shall not have openings from the walking surface to the required guard height that allow passage of a sphere 4 inches (102 mm) in diameter.

#### **Exceptions:**

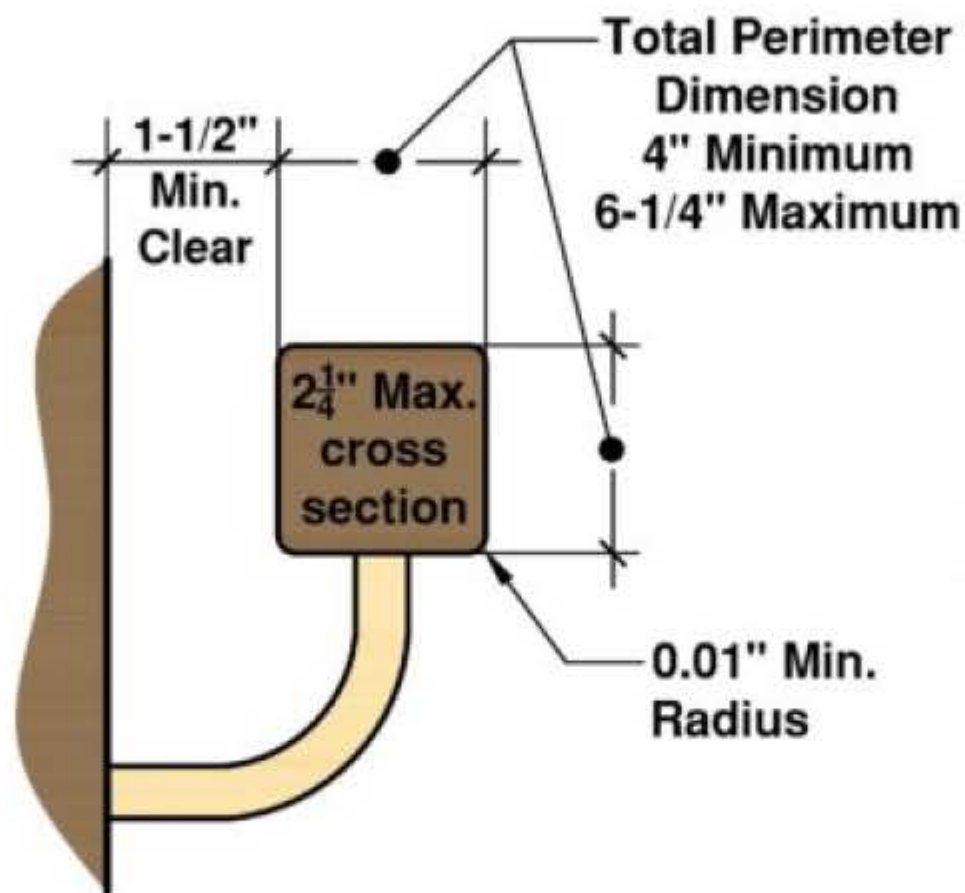
1. The triangular openings at the open side of stair, formed by the riser, tread and bottom rail of a guard, shall not allow passage of a sphere 6 inches (153 mm) in diameter.
2. Guards on the open side of stairs shall not have openings that allow passage of a sphere  $4\frac{3}{8}$  inches (111 mm) in diameter.



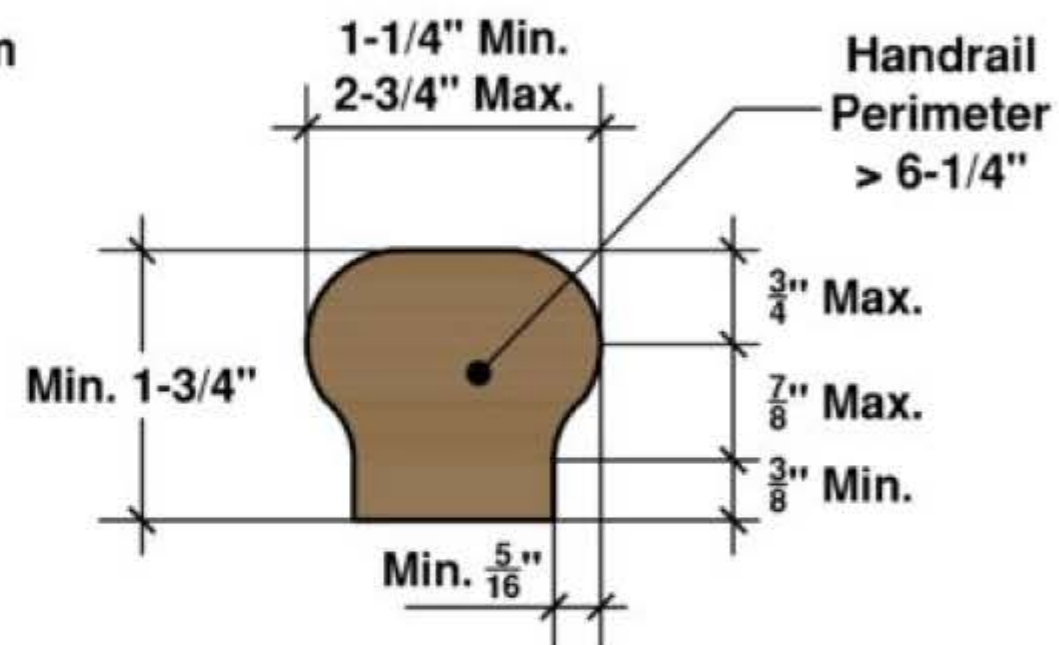




Circular Handrail  
Type I

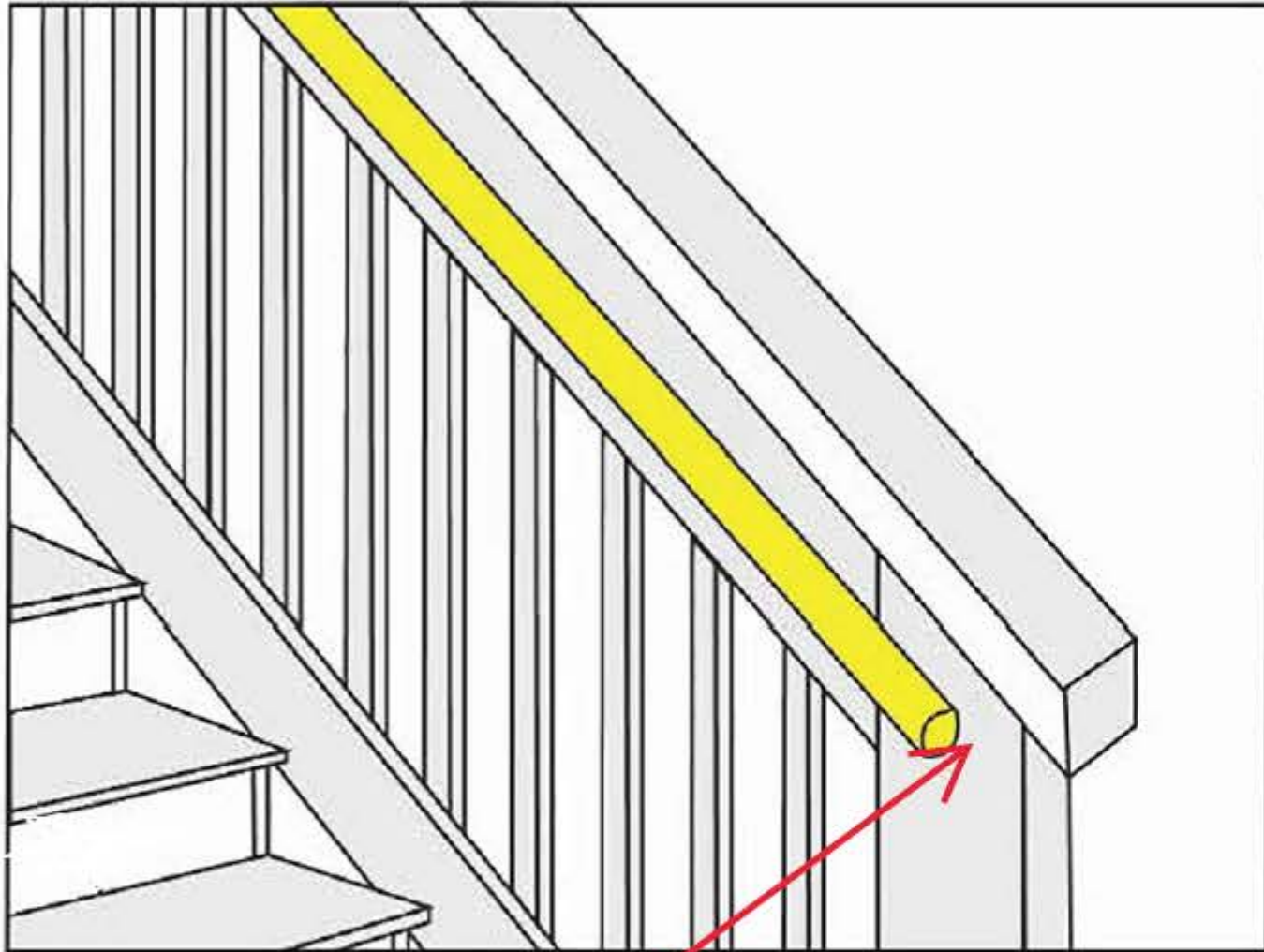


Non-Circular Handrail  
Type I

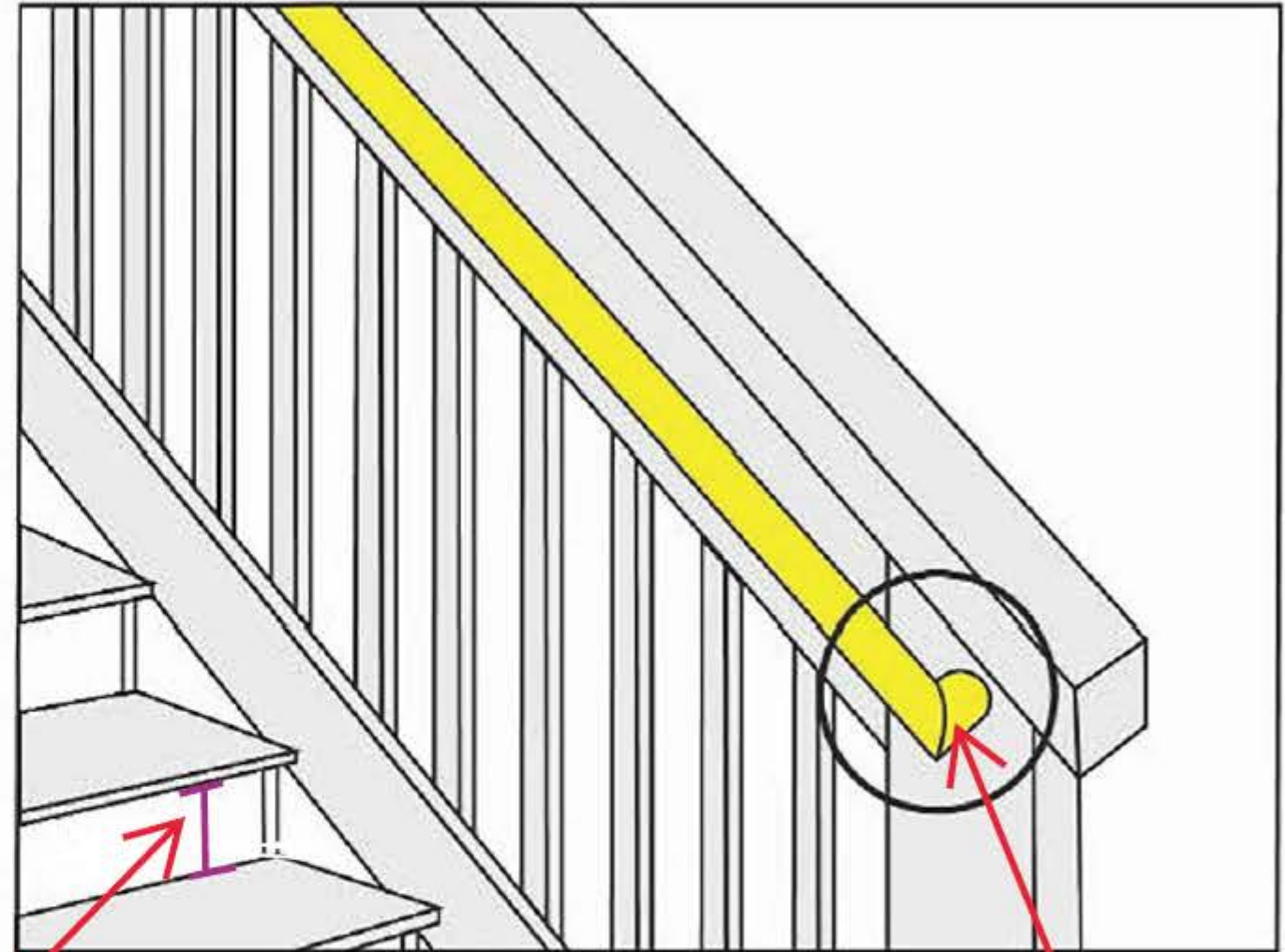


(Recessed) Handrail  
Type II





At open risers, openings located more than 30 inches (762 mm), as measured vertically, to the floor or grade below shall not permit the passage of a 4 "-diameter



Handrail ends shall be returned or shall terminate in newel posts or safety terminals.