



# STAIRWAYS, HANDRAILS, AND GUARDRAILS (RESIDENTIAL)

City of Austin  
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**Building Department**  
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## International Residential Code:

**R314.1 Width.** Stairways shall not be less than 36" in clear width at all points above the permitted handrail height and below the required headroom height. Handrails shall not project more than 4.5" on either side of the stairway and the minimum clear width of the stairway at and below the handrail height, including treads and landings, shall not be less than 31.5" where a handrail is installed on one side and 27" where handrails are provided on both sides.

**Exception:** The width of spiral stairways shall be in accordance with Section R314.5.

**R311.5.3 Treads & risers.** The maximum riser height shall be 7 3/4" and the minimum tread depth shall be 10". The riser height shall be measured vertically between leading edges of the adjacent treads. 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 walking surface of treads and landings of a stairway shall be sloped no steeper than one unit vertical in 48 units horizontal (2% slope). The greatest riser height within any flight of stairs shall not exceed the smallest by more than 3/8". The greatest tread depth within any flight of stairs shall not exceed the smallest by more than 3/8".

**R311.5.3.3 Profile.** Open risers are permitted, provided that the opening between treads does not permit the passage of a 4" diameter sphere. **Exception:** The opening between adjacent treads is not limited on stairs with a total rise of 30" or less.

**R311.5.2 Headroom.** The minimum headroom in all parts of the stairway shall not be less than 6' 8" measured vertically from the sloped plane adjoining the tread nosing or from the floor surface of the landing or platform.

**R311.5.3.2 Winders.** Winders are permitted, provided that the width of the tread at a point not more than 12" from the side where the treads are narrower is not less than 10" and the minimum width of any tread is not less than 6".

**R311.5.8.1 Spiral stairs.** Spiral stairways are permitted, provided the minimum width shall be 26" with each tread having a 7 1/2" minimum tread width at 12" from the narrow edge. All treads shall be identical, and the rise shall be no more than 9 1/2". A minimum headroom of 6' 6" shall be provided.

**R314.6 Circular stairways.** Circular stairways shall have a tread depth at a point not more than 12" from the side where the treads are narrower of not less than 10" and the minimum depth of any tread shall not be less than 6". Tread depth at any walking line measured a consistent distance from a side of the stairway shall be uniform as specified in Section R314.2.

**R311.2.2 Under stair protection.** Enclosed accessible space under stairs shall have walls, under stair surface, and any soffits protected on the enclosed side with 1/2" gypsum board.

**R311.5.6 Handrails.** Handrails shall be provided on at least one side of each continuous run of treads or flight with 4 or more risers.

**R311.5.6.1 Height.** Handrails for stairways 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.

**R311.5.6.2. Continuity.** Handrails for stairways 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.

Handrails shall be returned or shall terminate in newel posts or safety terminals.

Handrails adjacent to a wall shall have a space of not less than 1.5" between the wall and the handrails.

**Exceptions:**

- 1) Handrail shall be permitted to be interrupted by a newel post at a turn
- 2) The use of a volute, turnout, starting easing or starting newel shall be allowed over the lowest tread

**R311.5.6.3. Handrail grip size:** All required handrails shall be one of the following types or provide equivalent graspability

1. Type I. Handrails with a circular cross section shall have an outside diameter of at least 1 1/2 " and not greater than 2". If the handrail is not circular, it shall have a perimeter dimension of at least 4" and not greater than 6 1/4" with a maximum cross section dimension of 2 1/4'.
2. Type II. Handrails with a perimeter greater than 6 1/4" shall provide a graspable finger recess area on both sides of the profile. The finger recess shall begin within a distance of 1/4" measured vertically from the tallest portion of the profile and achieve a depth at least 5/16" within 7/8" below the widest of the profile. This required depth shall continue for at least 3/8' to a level that is not less than 1 3/4" below the tallest portion of the profile. The minimum width of the handrail above the recess shall be 1 1/4" to a maximum of 2 3/4".

**R311.2.1 Guards required.** Porches, balconies or raised floor surfaces located more than 30" above the floor or grade below shall have guards not less than 36" in height. Open sides of stairs with a total rise of more than 30" above the floor or grade below shall have guards not less than 34" in height measured vertically from the nosing of the treads. Porches and decks which are enclosed with insect screening shall be equipped with guards where the walking surface is located more than 30" above the floor or grade below.

**R312.2 Guard opening limitations.** Required guards on open sides of stairways, raised floor areas, balconies, and porches shall have intermediate rails or ornamental closures that do not allow passage of a sphere 4" (102 mm) or more in diameter.

**Exceptions:**

1. The triangular openings formed by the riser, tread and bottom rail of a guard at the open side of a stairway are permitted to be of such a size that a sphere 6 inches (152 mm) cannot pass through
2. Openings for required guards on the sides of stair treads shall not allow a sphere 4-3/8 inches (107 mm) to pass through

## **Landings at doors.**

**“The exterior landing at an exterior doorway shall not be more than 7 <sup>3</sup>/<sub>4</sub> inches below the top of the threshold, provided the door, other than an exterior storm or screen door does not swing over the landing.”**

**There is no minimum height of landing in the code.**

**IRC section R311.4.3**



## **Stairways.**

**“Stairways shall not be less than 36 inches in clear width at all points above the permitted handrail height... shall not project more than 4.5 inches on either side of the stairway ... shall not be less than 31.5 inches where a handrail is installed on one side and 27 inches where handrails are provided on both sides.”**



**IRC section R311.5.1**

## **Stair treads and risers.**

**“The maximum riser height shall be 7  $\frac{3}{4}$  inches. ...**

**The minimum tread depth shall be 10 inches.**

**The tread depth shall be measured horizontally between the vertical planes of the adjacent treads and at a right angle to the tread's leading edge.”**



**IRC section R311.5.3**



## **Stair handrail.**

**“Handrails shall be provided on at least one side of each continuous run of treads or flight of stairs with four or more risers.”**

**“Handrail height ... shall not be less than 34 inches and not more than 38 inches .”**

**IRC section R311.5.6**



## Stair handrail continuity.

“The use of a volute, turnout, starting easing or **starting newel** shall be allowed over the lowest tread.”



IRC section R311.5.6.2

## Guards.

**“Porches, balconies, ramps or raised floor surfaces located more than 30 inches above the floor or grade below shall have guards not less than 36 inches. ... Porches and decks which are enclosed with insect screening shall be equipped with guards ...”**



**IRC section R312.1**



## Guard opening limitations.

“Openings for required guards on the sides of stair treads shall not allow a sphere 4 3/8 inch to pass through.”



IRC section R312.1

## **Deck stairway.**

**Decks need to be designed for 40 psf live load, plus the dead load of the building material.**

**“Individual stair treads shall be designed for the uniformly distributed live load or a 300 pound concentrated load acting over an area of 4 square inches, whichever produces the greater stresses.”**



**IRC Table R301.5**

## **Landings at stairways.**

**“There shall be a floor or landing at the top and bottom of each stairway.”**

**“The width of each landing shall not be less than the width of stairway served. Every landing shall have a minimum dimension of 36 inches measured in the direction of travel.”**



**IRC section R311.5.4**

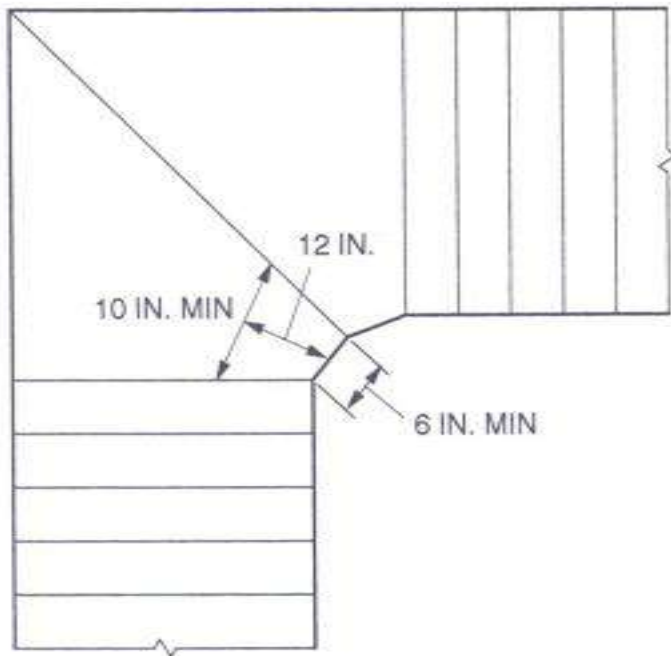
## **Landings at stairways.**

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

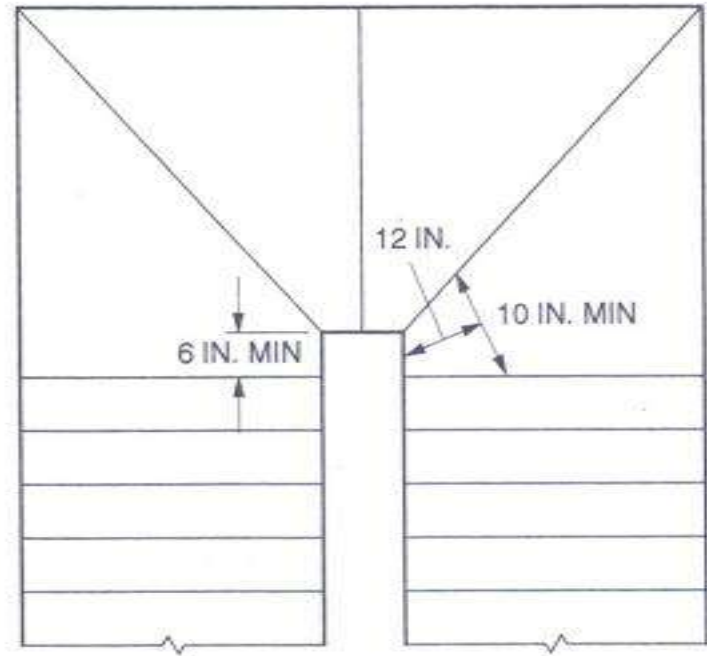
**IRC section R311.4.3**



**Winder treads shall have a minimum tread depth of 10 inches measured at a point 12 inches from the side where the treads are narrower. Winder treads shall have a minimum tread depth of 6 inches at any point.”**



**IRC section R311.5.3.2**



**Drawing courtesy of the ICC**



## Spiral stairways.

**“...Minimum width shall be 26 inches with each tread having a 7 1/2 inches minimum tread depth at 12 inches from the narrower edge. All treads shall be identical, and the rise shall be no more than 9 1/2 inches. A minimum headroom of 6 feet 6 inches shall be provided.”**

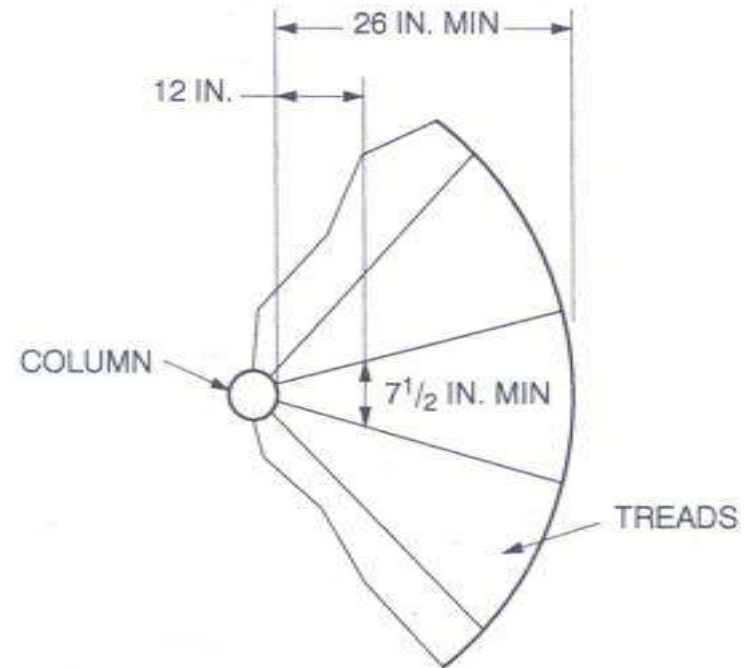


Figure R314.5  
SPIRAL STAIRS

## **Spiral stairways.**

**“All treads shall be identical,  
and the rise shall be no more  
than 9 1/2 inches.**

**A minimum headroom of 6 feet  
6 inches shall be provided.”**

**IRC section R311.5.8**

