Window Glazing – 2015 IRC Section 312.2

R308.4 Hazardous locations. The locations specified in Sections R308.4.1 through R308.4.7 shall be considered to be specific hazardous locations for the purposes of glazing.

R308.4.1 Glazing in doors. Glazing in fixed and operable panels of swinging, sliding and bi-fold doors shall be considered to be a hazardous location.
Exceptions:
1. Glazed openings of a size through which a 3- inch-diameter (76 mm) sphere is unable to pass.
2. Decorative glazing.

R308.4.2 Glazing adjacent to doors. Glazing in an individual fixed or operable panel adjacent to a door shall be considered to be a hazardous location where the bottom exposed edge of the glazing is less than 60 inches (1524 mm) above the floor or walking surface and it meets either of the following conditions:
1. Where the glazing is within 24 inches (610 mm) of either side of the door in the plane of the door in a closed position.
2. Where the glazing is on a wall perpendicular to the plane of the door in a closed position and within 24 inches (610 mm) of the hinge side of an in-swinging door.
Exceptions:
1. Decorative glazing.
2. Where there is an intervening wall or other permanent barrier between the door and the glazing.
3. Where access through the door is to a closet or storage area 3 feet (914 mm) or less in depth. Glazing in this application shall comply with Section R308.4.3.
4. Glazing that is adjacent to the fixed panel of patio doors.

R308.4.3 Glazing in windows. Glazing in an individual fixed or operable panel that meets all of the following conditions shall be considered to be a hazardous location:
1. The exposed area of an individual pane is larger than 9 square feet (0.836 m2),
2. The bottom edge of the glazing is less than 18 inches (457 mm) above the floor,
3. The top edge of the glazing is more than 36 inches (914 mm) above the floor; and
4. One or more walking surfaces are within 36 inches (914 mm), measured horizontally and in a straight line, of the glazing.
Exceptions:
1. Decorative glazing.
2. Where a horizontal rail is installed on the accessible side(s) of the glazing 34 to 38 inches (864 to 965 mm) above the walking surface. The rail shall be capable of withstanding a horizontal load of 50 pounds per linear foot (730 N/m) without contacting the glass and have a cross-sectional height of not less than 11/2 inches (38 mm).
3. Outboard panes in insulating glass units and other multiple glazed panels where the bottom edge of the glass is 25 feet (7620 mm) or more above *grade*, a roof, walking surfaces or other horizontal [within 45 degrees (0.79 rad) of horizontal] surface adjacent to the glass exterior.

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R308.4.4 Glazing in guards and railings. Glazing in *guards* and railings, including structural baluster panels and nonstructural in-fill panels, regardless of area or height above a walking surface shall be considered to be a hazardous location.

R308.4.5 Glazing and wet surfaces. Glazing in walls, enclosures or fences containing or facing hot tubs, spas, whirlpools, saunas, steam rooms, bathtubs, showers and indoor or outdoor swimming pools where the bottom exposed edge of the glazing is less than 60 inches (1524 mm) measured vertically above any standing or walking surface shall be considered to be a hazardous location. This shall apply to single glazing and each pane in multiple glazing.
Exception: Glazing that is more than 60 inches (1524 mm), measured horizontally and in a straight line, from the water's edge of a bathtub, hot tub, spa, whirlpool or swimming pool or from the edge of a shower, sauna or steam room.

R308.4.6 Glazing adjacent to stairs and ramps. Glazing where the bottom exposed edge of the glazing is less than 36 inches (914 mm) above the plane of the adjacent walking surface of stairways, landings between flights of stairs and ramps shall be considered to be a hazardous location.
Exceptions:
1. Where a rail is installed on the accessible side(s) of the glazing 34 to 38 inches (864 to 965 mm) above the walking surface. The rail shall be capable of withstanding a horizontal load of 50 pounds per linear foot (730 N/m) without contacting the glass and have a cross-sectional height of not less than 11/2 inches (38 mm).
2. Glazing 36 inches (914 mm) or more measured horizontally from the walking surface.

R308.4.7 Glazing adjacent to the bottom stair landing.
Glazing adjacent to the landing at the bottom of a stairway where the glazing is less than 36 inches (914 mm) above the landing and within a 60-inch (1524 mm) horizontal arc less than 180 degrees from the bottom tread nosing shall be considered to be a hazardous location.
Exception: The glazing is protected by a *guard* complying with Section R312 and the plane of the glass is more than 18 inches (457 mm) from the *guard*.

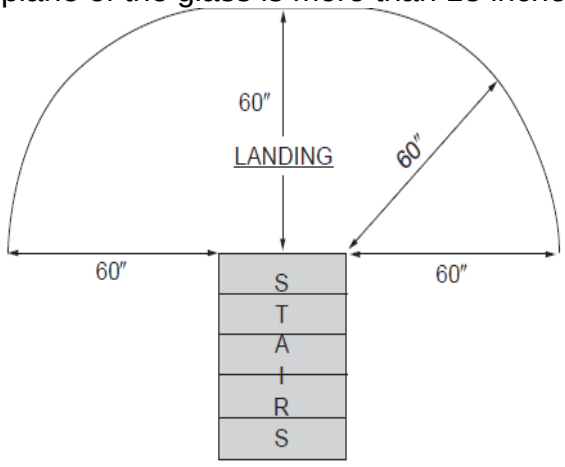


FIGURE R308.4.7
PROHIBITED GLAZING LOCATIONS AT BOTTOM STAIR LANDINGS

Window Glazing – 2015 IRC Section 312.2

Window Fall Protection Code Related Items

R312.2 Window fall protection. Window fall protection shall be provided in accordance with Sections R312.2.1 and R312.2.2.

R312.2.1 Window sills. In dwelling units, where the top of the sill of an operable window opening is located less than 24 inches (610 mm) above the finished floor and greater than 72 inches (1829 mm) above the finished grade or other surface below on the exterior of the building, the operable window shall comply with one of the following:

1. Operable windows with openings that will not allow a 4-inch-diameter (102 mm) sphere to pass through the opening where the opening is in its largest opened position.

2. Operable windows that are provided with window fall prevention devices that comply with ASTM F 2090.

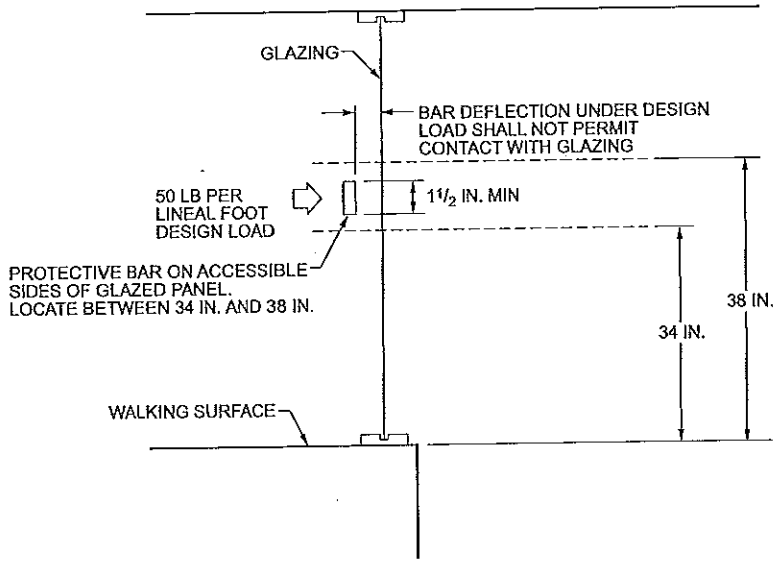
3. Operable windows that are provided with window opening control devices that comply with Section R312.2.2.

R312.2.2 Window opening control devices. Window opening control devices shall comply with ASTM F 2090. The window opening control device, after operation to release the control device allowing the window to fully open, shall not reduce the net clear opening area of the window unit to less than the area required by Section R310.2.1.

Exception 2 to Section R308.4.3 does not apply to panels adjacent to a door, so even though Panel 7 has a protective bar, safety glazing is still required (see Section R308.4.2).

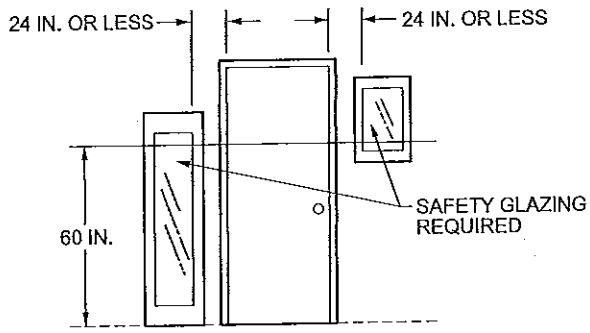
Commentary Figures R308.4(3) and R308.4(4) illustrate where safety glazing is required for panels adjacent to a door (see Section R308.4.2). This requirement applies to both fixed and operable panels. Where there is an intervening wall or permanent barrier, as shown in Commentary Figure R308.4(5), safety glazing would not be required (see Section R308.4.2, Exception 2). Commentary Figure R308.4(6) illustrates Exception 3 to Section R308.4.2, which applies to glazing positioned perpendicular to the plane of the door when it is in the closed position and the perpendicular glazing is on the latch side. Only one side is considered to be the hazardous location, the side that the door swings toward. The other side need not have safety glazing. This wall has a much lower risk of problems. When a door swings open to a perpendicular wall with glazing within 24 inches (610 mm), it is possible that if the door were caught by a strong wind it could slam into the wall and break the glass, or the doorknob could hit the glass and break it. There is also the possibility that someone could be caught behind the door when it is opened and they could be pushed into/through the glass. Thus, this would be an appropriate area to have the required safety glazing to protect the occupants.

Panels 8 and 9, as well as Panels 2 and 3, fall under



For SI: 1 inch = 25.4 mm, 1 pound per linear foot = 2.46 N/m.

Figure R308.4(2)
PROTECTIVE BAR ALTERNATIVE
(Section R308.4.3, Exception 2)



For SI: 1 inch = 25.4 mm.

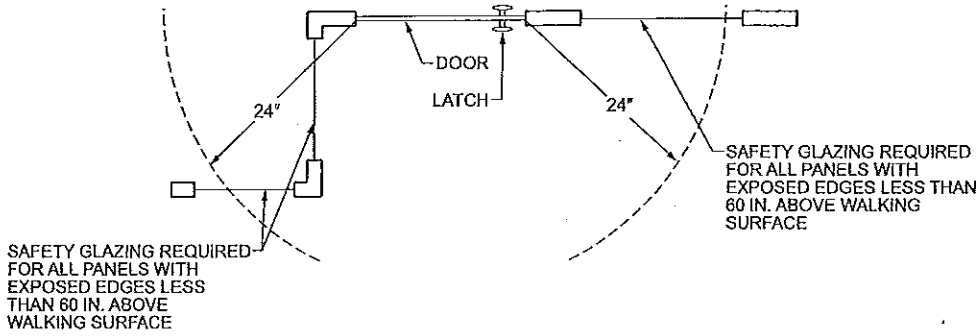
Figure R308.4(3)
GLAZING IN PANELS ADJACENT TO DOORS—ELEVATION
(Section R308.4.2)

Section R308.4.3. Under this section, all four stated conditions must occur before safety glazing is required. These conditions are as follows:

1. The area of an individual pane must be more than 9 square feet (0.84 m^2);
2. The bottom edge must be less than 18 inches (457 mm) above the floor;
3. The top edge must be more than 36 inches (914 mm) above the floor; and
4. One or more walking surfaces must be within 36 inches (914 mm), measured horizontally from the glazed panel.

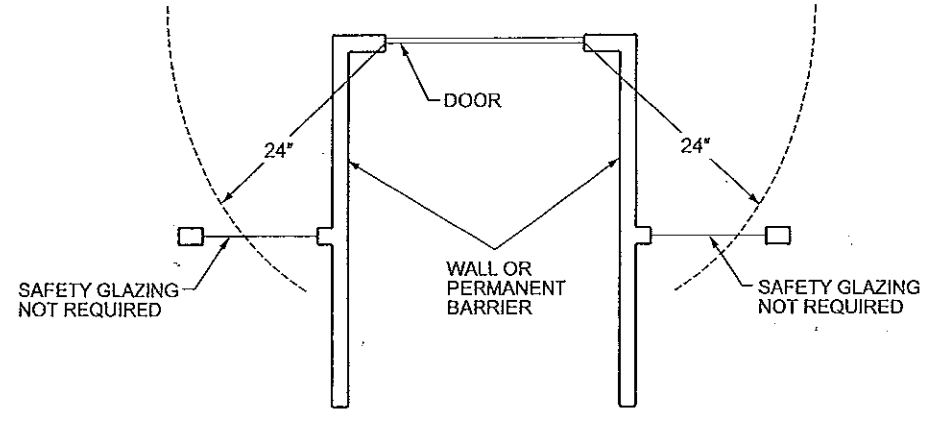
However, Panels 2 and 3 do not require safety glazing because their bottom edges are not less than 18 inches (457 mm) from the floor.

If Panels 8 and 9 have a walking surface within 36 inches (914 mm) horizontally of the interior, safety glazing would be required. From the exterior side, as shown in Commentary Figure R308.4(1), the bottom of the panel appears to be more than 18 inches (457 mm) above the exterior walking surface, so the exterior condition would have no bearing on the determination. Panels 5 and 6 are glass doors, which require safety glazing based on the provisions of Section R308.4.1. Glazing in doors (except louvered or jalousies in accordance with Exception 1 to Section R308.3) requires safety glazing, but there are two exceptions. If openings in a door will not pass a 3-inch-diameter (76 mm) sphere, the glazing is exempt (see Section R308.4.1, Exception 1), as are assemblies of decorative glass which is defined in Chapter 2 (see Section R308.4.1, Exception 2). The latter exception applies not only to doors but also to sidelights and other glazed panels (see Section R308.4.2, Exception 1). Glazing in railings, balusters, panels and nonstructural in-fill panels, regardless of their height above a walking surface, requires safety glazing (see Section R308.4.4). Because of the high prob-



For SI: 1 inch = 25.4 mm.

Figure R308.4(4)
GLAZING IN PANELS ADJACENT TO DOORS—PLAN
(Section R308.4.2)

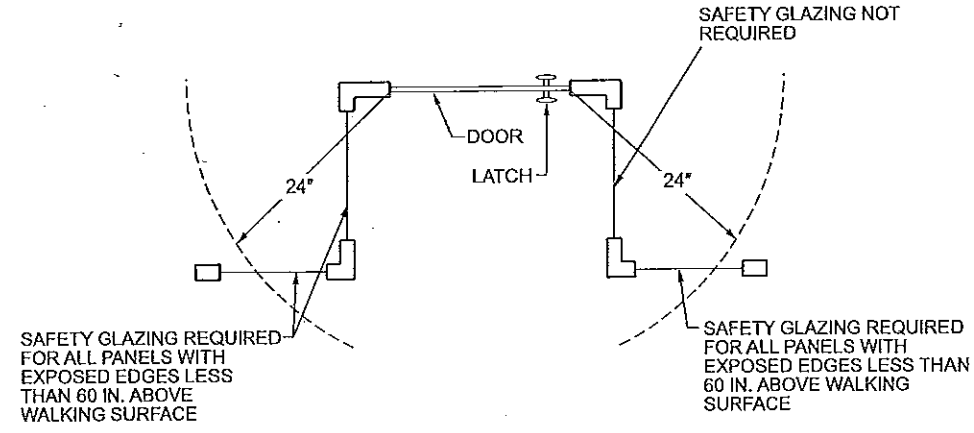


For SI: 12 inch = 25.4 mm.

Figure R308.4(5)
BARRIER BETWEEN GLAZING AND DOOR
(Section R308.4.2, Exception 2)

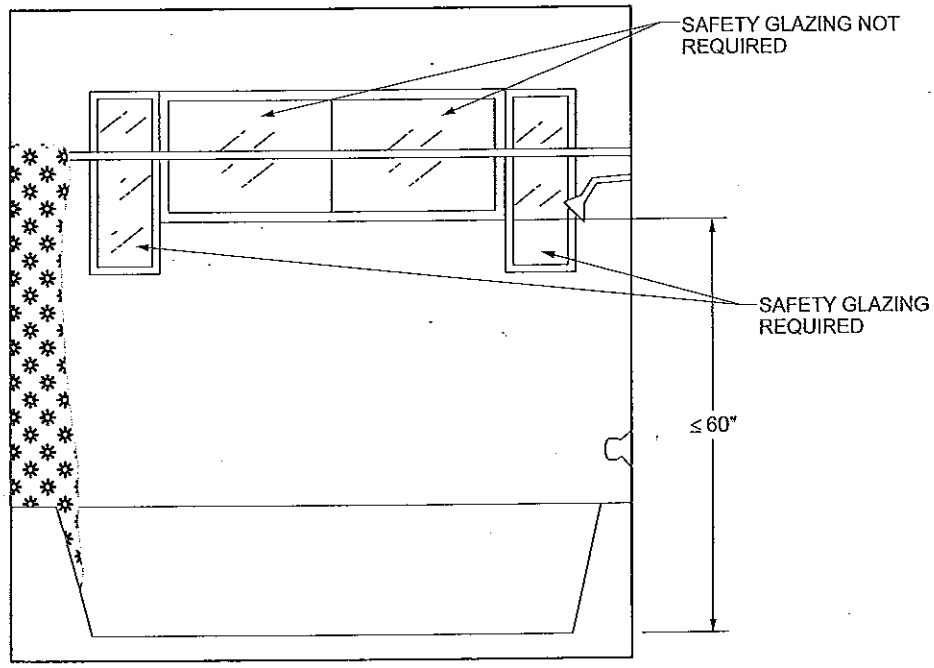
ability that people will strike guards, it is critical that an increased level of protection be provided.

Section R308.4.5 addresses glazing near water or wet areas. Safety glazing is required adjacent to hot tubs, spas, whirlpools, saunas, steam rooms, bathtubs, showers and swimming pools. Because of the presence of water, all of these locations represent slip hazards and need safety glazing to prevent injury in case of a fall. Glazing adjacent to these areas must be safety glazed if the glazing is less than 60 inches above any standing or walking surface. Commentary Figure R308.4(7) illustrates the condition where a window occurs within a shower enclosure. Commentary Figure R308.4(8) illustrates the requirements of Section R308.4.5. Glazing that is more than 60 inches (1524 mm) from the water's edge of a bathtub, hot tub, spa, whirlpool, swimming pool, shower, sauna or steam room is not a hazardous location in accordance



For SI: 1 degree = 0.01745 rad.

Figure R308.4(6)
GLAZING IN PANELS ADJACENT TO DOORS—PLAN
(Section R308.4.2, Item 2)



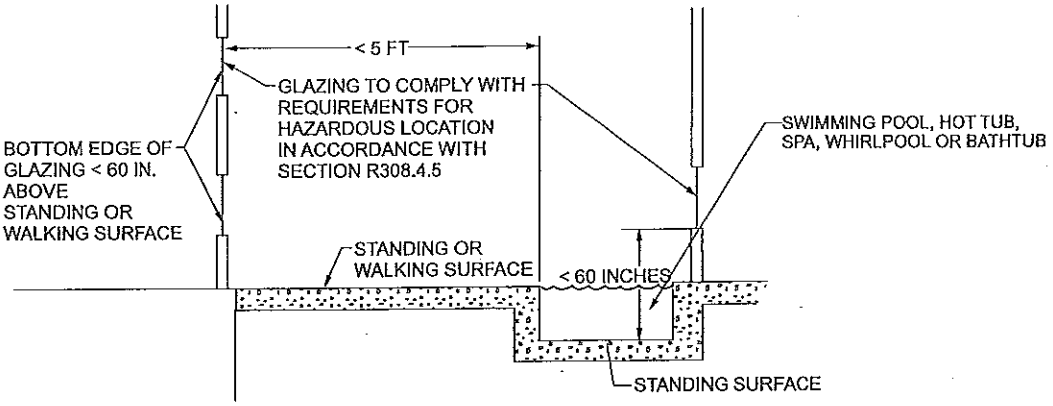
For SI: 1 inch = 25.4 mm.

Figure R308.4(7)
GLAZING WITHIN A SHOWER ENCLOSURE

with the exception to Section R308.4.5. Commentary Figure R308.4(9) illustrates the exception to Section R308.4.5.

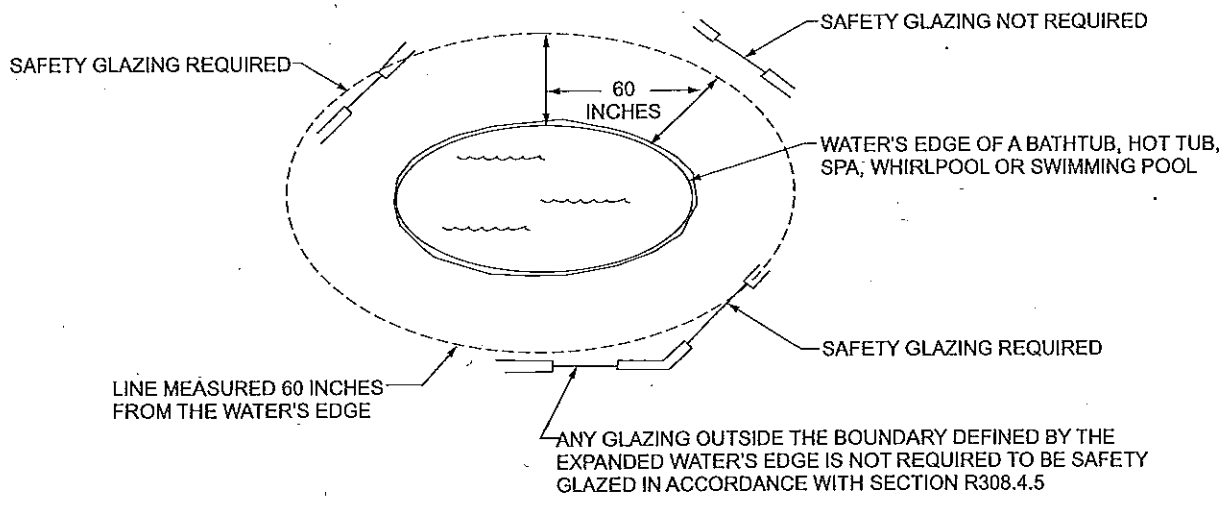
Sections R308.4.6 and R308.4.7 address the hazardous locations to be considered for stairways, landings and ramps. Stairways and ramps present users with a greater risk for injury caused by falling than a flat surface. Not only is the risk of falling greater when using a stair, but the injuries are generally more severe. Unlike falling on a flat surface where the floor will, for the most part, break a person's fall, there is nothing to stop someone from continuing to fall until he or she reaches the bottom of the stair. The increased risks inherent in stairways, as well as attempting to be consistent with other chapters in the code that mandate more restrictive requirements when addressing safety issues involving stairways and ramps, account for the more restrictive requirements for glazing in and around stairways and ramps.

Section R308.4.6 includes any glazing when the exposed surface of that glazing is within 36 inches (914 mm) above the plane of the adjacent walking surface. The walking surface in question would be part of a stair or ramp itself, including intermediate landings [see Commentary Figure R308.4(10)]. Safety glazing is not required for Exception 1 of Section R308.4.6 where the side of the stairway, landing or ramp has a rail, which can be part of the guard or handrail, which



For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

Figure R308.4(8)
GLAZING IN WET AREAS ADJACENT TO HOT TUBS, SPAS, WHIRLPOOLS, SAUNAS, STEAM ROOMS, BATHTUBS, SHOWERS AND SWIMMING POOLS



For SI: 1 inch = 25.4 mm.

Figure R308.4(9)
GLAZING AND WET SURFACES—PLAN VIEW
(Section R308.4.5, Exception)

has a load resistance of 50 pounds per linear foot (730 N/m) (for additional loading criteria for handrails and guards, see Table R301.5).

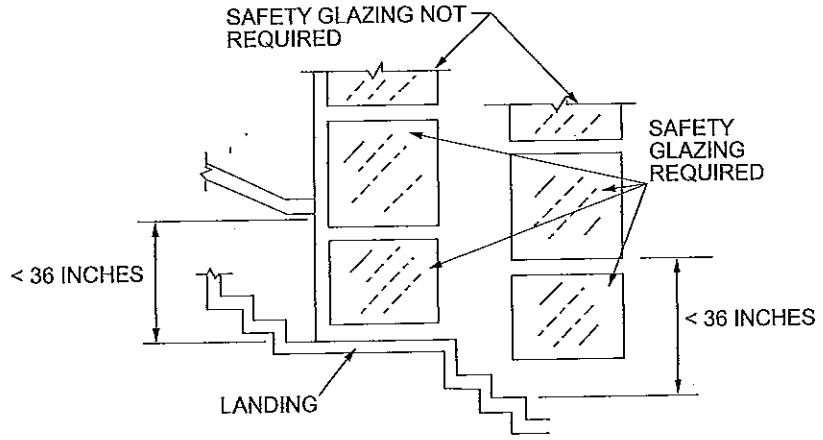
In Section R308.4.7, the concern is glazing that may be located within 60 inches (1524 mm) horizontally of the bottom tread of the stairway and within 36 inches (914 mm) vertically above the bottom landing of a stairway. The 60-inch (1524 mm) dimension is from any point along the nosing of the bottom tread, as measured horizontally in any direction to any surface of any glazing within that range [see Commentary Figure R308.4(11) and Figure R308.4.7]. The exception to Section R308.4.7 will permit nonsafety glazing where a guard is installed and the actual plane of the glazing is located at least 18 inches (457 mm) from the guard.

R308.4.1 Glazing in doors. Glazing in fixed and operable panels of swinging, sliding and bifold doors shall be considered to be a hazardous location.

Exceptions:

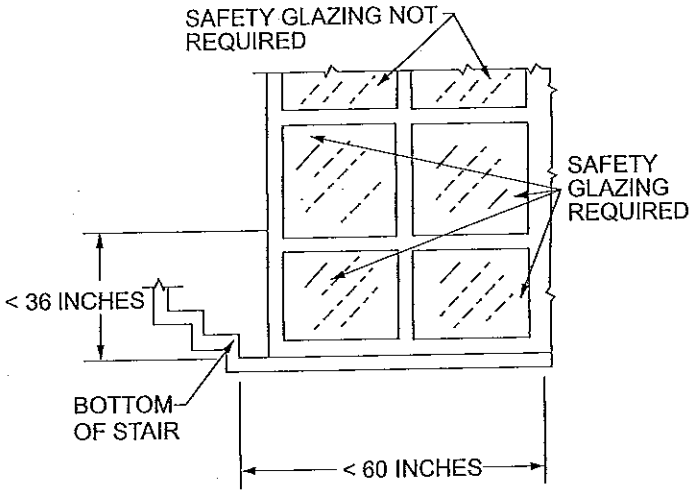
1. Glazed openings of a size through which a 3-inch-diameter (76 mm) sphere is unable to pass.
2. Decorative glazing.

❖ See the commentary to Section R308.4.



For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

Figure R308.4(10)
GLAZING ADJACENT TO STAIRWAYS
(Section to R308.4.6)



For SI: 1 inch = 25.4 mm.

Figure R308.4(11)
GLAZING ADJACENT TO THE BOTTOM STAIR LANDING
(Section R308.4.7)

2404 of the IBC, which sets forth the wind, snow, seismic and dead loads on glass.

R308.6 Skylights and sloped glazing. Skylights and sloped glazing shall comply with the following sections.

❖ Sloped glazing and skylights consist of glazing installed in roofs or walls that are on a slope 15 degrees (0.26 rad) or more from the vertical. The provisions of the code address loads normally attributed to roofs. The provisions also enhance the protection of the occupants of a building from the possibility of falling glazing materials.

R308.6.1 Definitions. The following terms are defined in Chapter 2:

SKYLIGHT, UNIT.

❖ Unit skylights are a specific type of sloped glazing assembly which is factory assembled. The IBC and the code contain specific provisions that are appropriate for this type of building component. Factory-assembled units, as opposed to site-built skylights, can be designed, tested and rated as one component, which incorporates both glazing and framing, if applicable. The individual components of site-built glazing must be designed to resist the design loads of the codes individually, and are not usually rated as an assembly.

SKYLIGHTS AND SLOPED GLAZING.

❖ The failure of skylights and sloped glazing could result in injury and building damage. This definition establishes the criteria to which the code requirements of Section R308.6 are to apply.

TUBULAR DAYLIGHTING DEVICE (TDD).

❖ This definition provides the distinction from a unit skylight. Although tubular daylighting devices (TDDs) and unit skylights are similar and subjected to the same testing and labeling requirements, there are some differences. A TDD is typically field assembled from a manufactured kit, unlike a unit skylight which is typically shipped as a factory-assembled unit. If the unit skylight definition is applied to TDDs, it would imply that TDDs be entirely assembled in the factory. Also, the dome of a TDD is not necessarily constructed out of a single panel of glazing material. As such, a separate definition from that of a unit skylight is needed. The definition is adapted from the definition in AAMA/WDMA A440.

R308.6.2 Materials. The following types of glazing shall be permitted to be used:

1. Laminated glass with not less than a 0.015-inch (0.38 mm) polyvinyl butyral interlayer for glass panes 16 square feet (1.5 m^2) or less in area located such that the highest point of the glass is not more than 12 feet (3658 mm) above a walking surface or other accessible area; for higher or larger sizes, the interlayer thickness shall be not less than 0.030 inch (0.76 mm).
2. Fully tempered glass.
3. Heat-strengthened glass.
4. Wired glass.
5. *Approved* rigid plastics.

❖ The provisions of this section limit glazing materials in skylights and sloped glazing to those specified, and they outline glazing materials and protective measures for sloped glazing and skylights. The materials and their characteristics and limitations are as follows:

Laminated glass. Laminated glass is usually constructed with an inner layer of polyvinyl butyral, which has a minimum thickness of 0.030 inch (0.76 mm). Such glass is highly resistant to impact and, as a result, requires no further protection below. When used within dwelling units, laminated glass is permit-

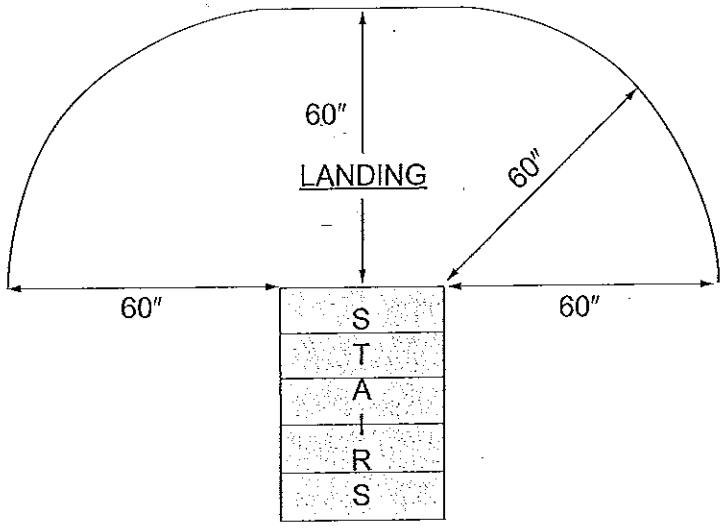


FIGURE R308.4.7
PROHIBITED GLAZING LOCATIONS AT BOTTOM STAIR LANDINGS