

## Construction Tip Sheet 19 Safety Glazing (IRC 2009)

Attached is IRC 2009 section R308 Glazing. This section covers the safety aspects for any glass that is installed in a building and calls out hazardous locations that require a higher degree of product safety. Glazing placed in hazardous locations must be designed for human impact loads (most common design is tempered glass) or where allowed, be protected from impact with a rail. Section R308.4 lists the hazardous locations; please review this section, the commentary to it and the figures following the section to determine if your project will require safety glazing.

other panes must be labeled either "16 CFR 1201" or "ANSI Z97.1."

**R308.2 Louvered windows or jalousies.** Regular, float, wired or patterned glass in jalousies and louvered windows shall be no thinner than nominal  $\frac{3}{16}$  inch (5 mm) and no longer than 48 inches (1219 mm). Exposed glass edges shall be smooth.

❖ The requirements for louvered windows exist because there is no edge support on the longitudinal edges of these panes. The code requires that the exposed edges be smooth for safety. The minimum thickness and maximum span are specified so that the glass has sufficient resistance to human impact loads.

**R308.2.1 Wired glass prohibited.** Wired glass with wire exposed on longitudinal edges shall not be used in jalousies or louvered windows.

❖ Wired glass is not permitted if the wire is exposed on the longitudinal edge because it would be a hazard.

**R308.3 Human impact loads.** Individual glazed areas, including glass mirrors in hazardous locations such as those indicated as defined in Section R308.4, shall pass the test requirements of Section R308.3.1.

**Exceptions:**

1. Louvered windows and jalousies shall comply with Section R308.2.
2. Mirrors and other glass panels mounted or hung on a surface that provides a continuous backing support.
3. Glass unit masonry complying with Section R610.

❖ The code requires that glazing in hazardous locations subject to human impact pass the impact tests. Criteria is based on size and location [see Section R308.3.1, and Tables R308.3(1) and R308.3.1(2)]. The exceptions provide for three types of glazing that have alternative means of offering protection when used in hazardous locations: louvered windows and jalousies meeting the thickness and length limitations in Section R308.2; mirrors or glass hung on a wall or fitted with a backing; and glass block constructed in accordance with Section R610. Glass block is becoming more prevalent in the design of homes. One of the more common uses is enclosures for walk-in showers.

**R308.3.1 Impact test.** Where required by other sections of the code, glazing shall be tested in accordance with CPSC 16 CFR 1201. Glazing shall comply with the test criteria for Category I or II as indicated in Table R308.3.1(1).

**Exception:** Glazing not in doors or enclosures for hot tubs, whirlpools, saunas, steam rooms, bathtubs and showers shall be permitted to be tested in accordance with ANSI Z97.1. Glazing shall comply with the test criteria for Class A or B as indicated in Table R308.3.1 (2).

❖ Section 308.4 lists eight different situations where there is a chance of someone falling or reaching into a piece of glass and possibly injuring themselves; therefore, testing is required to resist these human impact loads. Glazing in hazardous locations must pass the test requirements of CPSC 16 CFR, Part 1201 and

## SECTION R308 GLAZING

**R308.1 Identification.** Except as indicated in Section R308.1.1 each pane of glazing installed in hazardous locations as defined in Section R308.4 shall be provided with a manufacturer's designation specifying who applied the designation, designating the type of glass and the safety glazing standard with which it complies, which is visible in the final installation. The designation shall be acid etched, sandblasted, ceramic-fired, laser etched, embossed, or be of a type which once applied cannot be removed without being destroyed. A label shall be permitted in lieu of the manufacturer's designation.

**Exceptions:**

1. For other than tempered glass, manufacturer's designations are not required provided the *building official* approves the use of a certificate, affidavit or other evidence confirming compliance with this code.
  2. Tempered spandrel glass is permitted to be identified by the manufacturer with a removable paper designation.
- ❖ Once glass is installed in a window frame by a manufacturer, whether that glass is safety glazing or not is not easily determined. In theory, this can be established only by breaking the particular piece of glass, in which case the glass is no longer useable. Thus, the code requires that safety glazing be marked with a manufacturer's designation that is visible during the final building inspection. Except for tempered glass labels, labels may be omitted where approved by the building official and an affidavit, certificate or other evidence is submitted indicating compliance with the code. A manufacturer can identify safety glazing with a removable paper designation, provided it is destroyed during removal. This ensures that the designation will not be applied to a noncomplying piece of glass.

**R308.1.1 Identification of multiple assemblies.** Multipane assemblies having individual panes not exceeding 1 square foot (0.09 m<sup>2</sup>) in exposed area shall have at least one pane in the assembly identified in accordance with Section R308.1. All other panes in the assembly shall be labeled "CPSC 16 CFR 1201" or "ANSI Z97.1" as appropriate.

❖ Multipane assemblies of glass need identification for the same reasons noted in Section R308.1. This provision allows labeling of only one pane of glass in accordance with Section R308.1.1, when the exposed area of each pane is 1 square foot (0.09 m<sup>2</sup>) or less. All

meet the categories specified in Table R308.3.1(1). The exception allows for another standard, ANSI Z97.1, as an alternative test for glazing that is located other than in a door or serving as part of a bathing enclosure. This limitation in the exception is due to the mandatory location requirements in CPSC 16 CFR, Part 1201.

Set forth below are the more significant differences between these two standards, both of which are applicable to safety glazing materials used in architectural applications. This statement makes no attempt to summarize all pertinent provisions of the two standards, only their significant differences.

The principal differences between CPSCs 16 CFR, Part 1201 and ANSI Z97.1 relate to their scope and function. The CPSC standard is not only a test method and a procedure for determining the safety performance of architectural glazing, but also a federal standard that mandates where and when safety glazing materials must be used in architectural applications and preempts any nonidentical state or local standard. In contrast, ANSI Z97.1 is only a voluntary safety performance specification and test method. It does not purport to indicate where and when safety glazing materials must be used, leaving those determinations up to the building codes and to glass and fenestration specifiers. In this instance, the IBC provides the requirements regarding the safety performance of architectural glazing beyond that which is covered by the federal standard.

The CPSC standard requires the installation of safety glazing materials meeting 16 CFR, Part 1201 only in storm doors, combination doors, entrance-exit doors, sliding patio doors, closet doors, and shower and tub doors and enclosures. See Section 308.4 of the IBC for additional locations where the code requires safety glazing.

**Test Specimens:** For impact testing, the CPSC standard requires only one specimen of each nominal thickness be submitted for testing and specifies it must be the largest size the manufacturer produces up to a maximum size of 34-inches by 76 inch (864 mm by 1830 mm). ANSI Z97.1 requires that four specimens of each nominal thickness and size must be impact tested. The manufacturer has the option of testing either 34-inch by 76-inch (864 mm by 1830 mm) specimens or the largest size it commercially produces less than 34 inches by 76 inches (864 mm by 1830 mm), but with a minimum size of 24 inches by 30 inches (610 mm by 762 mm).

**Types of Glass:** The CPSC standard has no performance tests for plastics or for bent glass. ANSI Z97.1 has specific tests for both.

The CPSC standard does not prohibit the use of ordinary annealed glass in hazardous locations as long as it passes the appropriate impact tests, consistent with the concept of a performance-based impact test. [Thick, heavy annealed glass is likely to pass the CPSC 18-inch (457 mm) drop-height and 48-inch (1219 mm) drop-height impact tests for Category I and II locations.]

ANSI Z97.1 contains an express limitation on annealed glass: "Monolithic annealed in any thickness is not considered safety glazing material under this standard."

**Asymmetrical Glazing Material:** The CPSC standard requires all asymmetrical glazing materials to be impacted on both sides of each specimen and then evaluated under the pass-fail criteria. There is no exception. ANSI Z97.1 requires that, with the exception of mirror glazing, all asymmetrical glass specimens must be impacted on both sides, two on one side and two on the other. With respect to mirror glazing products using reinforced or nonreinforced organic adhesive backing, all four specimens must be impacted only on the nonreinforced side "and with no other material applied."

**Impact Categories or Levels:** See the commentary to Tables R308.3.1(1) and R308.3.1(2).

**Pass-fail Impact Criteria:** The CPSC standard, like the ANSI standard, offers alternative criteria for evaluating whether a test specimen passes the impact test. The CPSC standard considers the specimen a pass if a 3-inch-diameter (76 mm) solid steel ball, weighing 4 pounds (18 N), will not pass through the opening when placed on the specimen for 1 second. ANSI uses the 3-inch (76 mm) sphere measure, but does not require the sphere to be a steel ball and does not specify its weight. It does require that the sphere not pass freely through the opening when a force of 4 pounds (18 N) is applied to the sphere. There is no time element associated with this alternative.

A second alternative pass-fail criterion under the CPSC standard involves weighing the 10 largest particles selected within 5 minutes after the impact test—they must weigh no more than the equivalent weight of 10 square inches (6452 m<sup>2</sup>) of the original specimen. The ANSI standard has an almost identical criterion, except the 10 largest particles must be "crack free." It also includes additional product-specific qualifications applicable solely to selecting the 10 largest particles of tempered glass and offers a formula for determining the weight of 10 square inches (6452 m<sup>2</sup>) of the original specimen.

The CPSC standard has no separate pass-fail impact criteria for the scenario in which the glass specimen separates from the frame after impact and breaks or produces a hole in the glass. The ANSI standard has a special criterion for that scenario—to pass, the glass is subjected to the same 3-inch (76 mm) sphere measure or to the weight criterion for the 10 largest crack-free particles.

The CPSC standard involves impact testing of only a single specimen of each nominal glass thickness. Accordingly, if that specimen passes, all glass of that type and thickness is deemed to pass. Under the ANSI standard, four specimens of each type, size and thickness must be impact tested, and if any one of the four specimens fails, there is a failure of that specific type, thickness and size.

**Impact Testing Apparatus:** Relatively minor technical differences exist between the test frames and impactors specified in the CPSC standard and those in ANSI

Z97.1. The ANSI standard prescribes special test frame and subframe configurations for impact testing bent glass; the CPSC standard has no provisions for testing bent glass. The ANSI standard includes detailed specifications for the impactor suspension device and traction and release system, and for their operation; the CPSC standard does not.

**Weathering Tests:** The CPSC standard requires a weathering test only for organic-coated glass. ANSI requires a weathering test for laminated glass and plastics, as well as for organic-coated glass.

The CPSC accelerated weathering test (only for organic-coated glass) uses the xenon arc Weatherometer. The ANSI standard gives the manufacturer the choice of one of three weathering exposure alternatives: the xenon arc exposure, the enclosed twin carbon

arc exposure or the 1-year outdoor exposure in South Florida. The ANSI prescribed xenon arc apparatus and procedure are the more current versions of the pertinent ASTM standards, ASTM D 2565 and ASTM G 155, than the versions referenced in the CPSC standard. The CPSC's xenon arc procedure for interpreting results of the adhesion test requires an average adhesion value or pull force of no less than 90 percent of the average of the unexposed organic-coated glass specimens in order to "pass," whereas the ANSI standard requires no less than 75 percent of the average of the unexposed specimens.

**Indoor Aging Tests:** The CPSC standard does not prescribe any indoor aging test; the ANSI standard requires specified indoor aging tests for plastics and or-

**TABLE R308.3.1(1)**  
**MINIMUM CATEGORY CLASSIFICATION OF GLAZING USING CPSC 16 CFR 1201**

EXPOSED SURFACE AREA OF ONE SIDE OF ONE LITE	GLAZING IN STORM OR COMBINATION DOORS (Category Class)	GLAZING IN DOORS (Category Class)	GLAZED PANELS REGULATED BY ITEM 7 OF SECTION R308.4 (Category Class)	GLAZED PANELS REGULATED BY ITEM 6 OF SECTION R308.4 (Category Class)	GLAZING IN DOORS AND ENCLOSURES REGULATED BY ITEM 5 OF SECTION R308.4 (Category Class)	SLIDING GLASS DOORS PATIO TYPE (Category Class)
9 square feet or less	I	I	NR	I	II	II
More than 9 square feet	II	II	II	II	II	II

For SI: 1 square foot = 0.0929 m<sup>2</sup>.  
NR means "No Requirement."

❖ In 1977, the CPSC adopted as a mandatory federal safety regulation *Safety Standard for Architectural Glazing Materials*, codified at 16 CFR, Part 1201. The CPSC amended the regulation on several occasions subsequent to its initial adoption, the last time on June 28, 1982. For additional information, see the commentary to Section R308.3.1.

**Impact Categories or Levels:** The CPSC standard has two distinct impact levels or categories, Category I and Category II, and specifies which defined hazardous location must contain Category II safety glazing materials and which may use Category I glazing materials. Glazing material successfully passing the impact test of a 48-inch (1219 mm) drop height a 400 foot-pound (940 J) impact, is classified as Category II glass. Glazing material passing the 18-inch (457 mm) drop height, at 150 foot-pounds (203.4 J) impact, is classified as Category I glass.

**TABLE R308.3.1(2)**  
**MINIMUM CATEGORY CLASSIFICATION OF GLAZING USING ANSI Z97.1**

EXPOSED SURFACE AREA OF ONE SIDE OF ONE LITE	GLAZED PANELS REGULATED BY ITEM 7 OF SECTION R308.4 (Category Class)	GLAZED PANELS REGULATED BY ITEM 6 OF SECTION R308.4 (Category Class)	DOORS AND ENCLOSURES REGULATED BY ITEM 5 OF SECTION R308.4 <sup>a</sup> (Category Class)
9 square feet or less	No requirement	B	A
More than 9 square feet	A	A	A

For SI: 1 square foot = 0.0929 m<sup>2</sup>.

a. Use is permitted only by the exception to Section R308.3.1.

❖ ANSI Z97.1 was revised in 2004. Utilization of this testing for glazing in hazardous locations is limited by the exception in Section R308.3.1. For additional information, see the commentary to Section R308.3.1.

**Impact Categories or Levels:** ANSI Z97.1 has adopted three separate impact categories or classes, based upon impact performance. ANSI Z97.1's Class A glazing materials are comparable to the CPSC's Category II glazing materials, passing a 48-inch (1219 mm) drop-height test, and its Class B glazing materials are comparable to the CPSC's Category I glazing materials, passing the 18-inch (457 mm) drop-height test. ANSI Z97.1 also has a product-specific Class C impact test, a 12-inch (305 mm) drop-height test, applicable only for fire-resistant glazing materials. However, Table R308.3.1(2) does not identify Class C as an acceptable product for use in hazardous locations.

ganic-coated glass intended for indoor-use only, followed by impact tests.

**R308.4 Hazardous locations.** The following shall be considered specific hazardous locations for the purposes of glazing:

1. Glazing in all fixed and operable panels of swinging, sliding and bifold doors.

**Exceptions:**

1. Glazed openings of a size through which a 3-inch diameter (76 mm) sphere is unable to pass.
2. Decorative glazing.
2. Glazing in an individual fixed or operable panel adjacent to a door where the nearest vertical edge is within a 24-inch (610 mm) arc of the door in a closed position and whose bottom edge is less than 60 inches (1524 mm) above the floor or walking surface.

**Exceptions:**

1. Decorative glazing.
2. When there is an intervening wall or other permanent barrier between the door and the glazing.
3. Glazing in walls on the latch side of and perpendicular to the plane of the door in a closed position.
4. Glazing adjacent to a door where access through the door is to a closet or storage area 3 feet (914 mm) or less in depth.
5. Glazing that is adjacent to the fixed panel of patio doors.
3. Glazing in an individual fixed or operable panel that meets all of the following conditions:
  - 3.1. The exposed area of an individual pane is larger than 9 square feet (0.836 m<sup>2</sup>); and
  - 3.2. The bottom edge of the glazing is less than 18 inches (457 mm) above the floor; and
  - 3.3. The top edge of the glazing is more than 36 inches (914 mm) above the floor; and
  - 3.4. 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. When a horizontal rail is installed on the accessible side(s) of the glazing 34 to 38 inches (864 to 965) 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 be a minimum of 1½ inches (38 mm) in cross sectional height.
3. Outboard panes in insulating glass units and other multiple glazed panels when

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.

4. All glazing in railings regardless of area or height above a walking surface. Included are structural baluster panels and nonstructural infill panels.
5. Glazing in enclosures for or walls facing hot tubs, whirlpools, saunas, steam rooms, bathtubs and showers where the bottom exposed edge of the glazing is less than 60 inches (1524 mm) measured vertically above any standing or walking surface.

**Exception:** Glazing that is more than 60 inches (1524 mm), measured horizontally and in a straight line, from the waters edge of a hot tub, whirlpool or bathtub.

6. Glazing in walls and fences adjacent to indoor and outdoor swimming pools, hot tubs and spas where the bottom edge of the glazing is less than 60 inches (1524 mm) above a walking surface and within 60 inches (1524 mm), measured horizontally and in a straight line, of the water's edge. This shall apply to single glazing and all panes in multiple glazing.
7. Glazing adjacent to stairways, landings and ramps within 36 inches (914 mm) horizontally of a walking surface when the exposed surface of the glazing is less than 60 inches (1524 mm) above the plane of the adjacent walking surface.

**Exceptions:**

1. When 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 be a minimum of 1½ inches (38 mm) in cross sectional height.
2. The side of the stairway has a guardrail or hand-rail, including balusters or in-fill panels, complying with Sections R311.7.6 and R312 and the plane of the glazing is more than 18 inches (457 mm) from the railing; or
3. When a solid wall or panel extends from the plane of the adjacent walking surface to 34 inches (863 mm) to 36 inches (914 mm) above the walking surface and the construction at the top of that wall or panel is capable of withstanding the same horizontal load as a *guard*.
8. Glazing adjacent to stairways within 60 inches (1524 mm) horizontally of the bottom tread of a stairway in any direction when the exposed surface of the glazing is less than 60 inches (1524 mm) above the nose of the tread.

**Exceptions:**

1. The side of the stairway has a guardrail or hand-rail, including balusters or in-fill panels, complying with Sections R311.7.6 and R312 and

the plane of the glass is more than 18 inches (457 mm) from the railing; or

2. When a solid wall or panel extends from the plane of the adjacent walking surface to 34 inches (864 mm) to 36 inches (914 mm) above the walking surface and the construction at the top of that wall or panel is capable of withstanding the same horizontal load as a *guard*.

❖ This section lists eight specific hazardous locations where safety glazing is required. Listed under each location are exceptions specific to that location. Some of these locations are shown in Commentary Figures R308.4(1) through R308.4(9). In addition to the hazardous locations shown in the nine drawings, safety glazing is also required in a number of other locations, including fixed and sliding panels of sliding door assemblies, storm doors and glass railings.

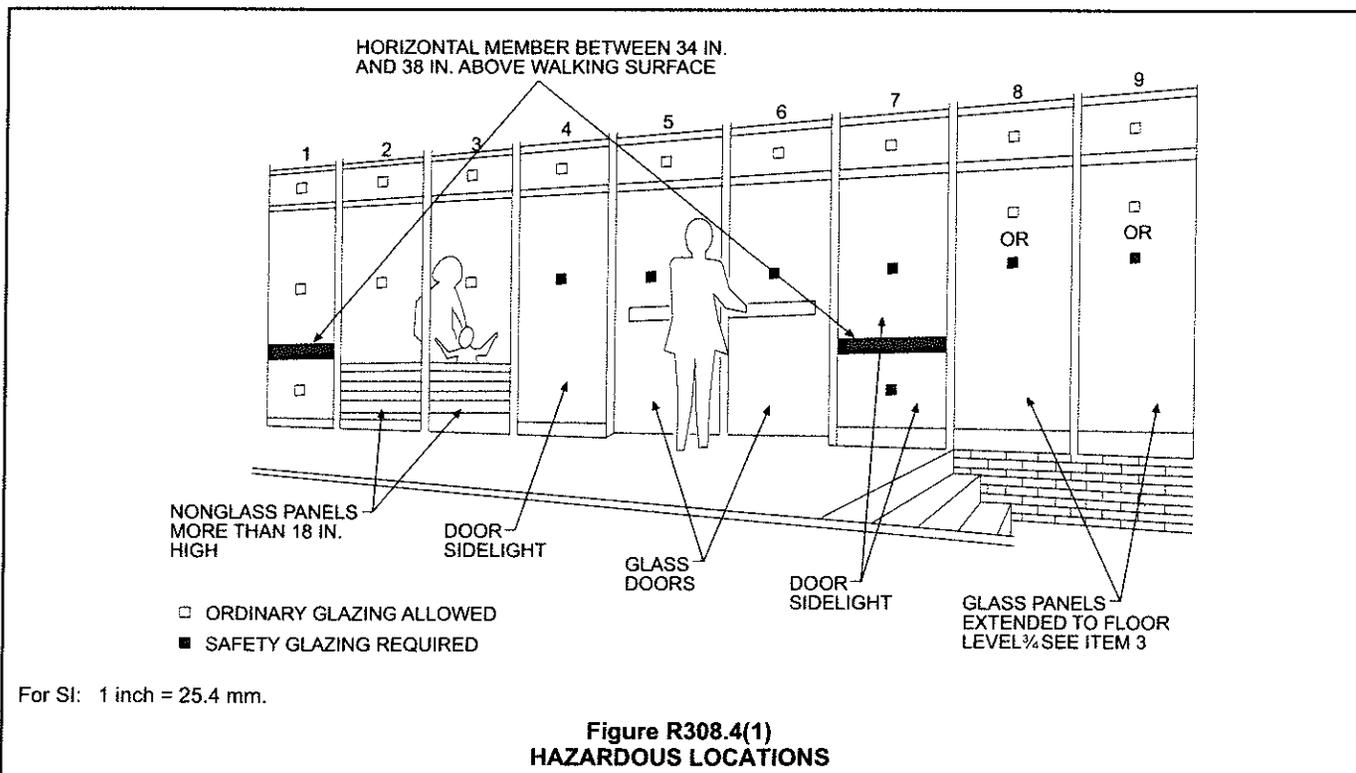
Commentary Figure R308.4(1) illustrates several locations where safety glazing may or may not be required. To facilitate discussion, each glazed panel has been numbered. Panel 1 is not required to have a safety glazing because a protective bar has been installed in compliance with Exception 2 to Item 3, the details of which are illustrated in Commentary Figure R308.4(2). Panels 4 and 7 require safety glazing because they are door sidelights. The exception mentioned above does not apply to panels adjacent to a door, so even though Panel 7 has a protective bar, safety glazing is still required (see Item 2).

Commentary Figures R308.4(3) and R308.4(4) illustrate where safety glazing is required for panels adjacent to a door (see Item 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 Item 2, Exception 2). Commentary Figure R308.4(6) illustrates Exception 3 to Item 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 door knob 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 Item 3 of Section R308.4. Under this item, all four stated conditions must occur before safety glazing is required. These conditions are as follows:

- 3.1. The area of an individual pane must be more than 9 square feet (0.84 m<sup>2</sup>);
- 3.2. The bottom edge must be less than 18 inches (457 mm) above the floor;
- 3.3. The top edge must be more than 36 inches (914 mm) above the floor; and

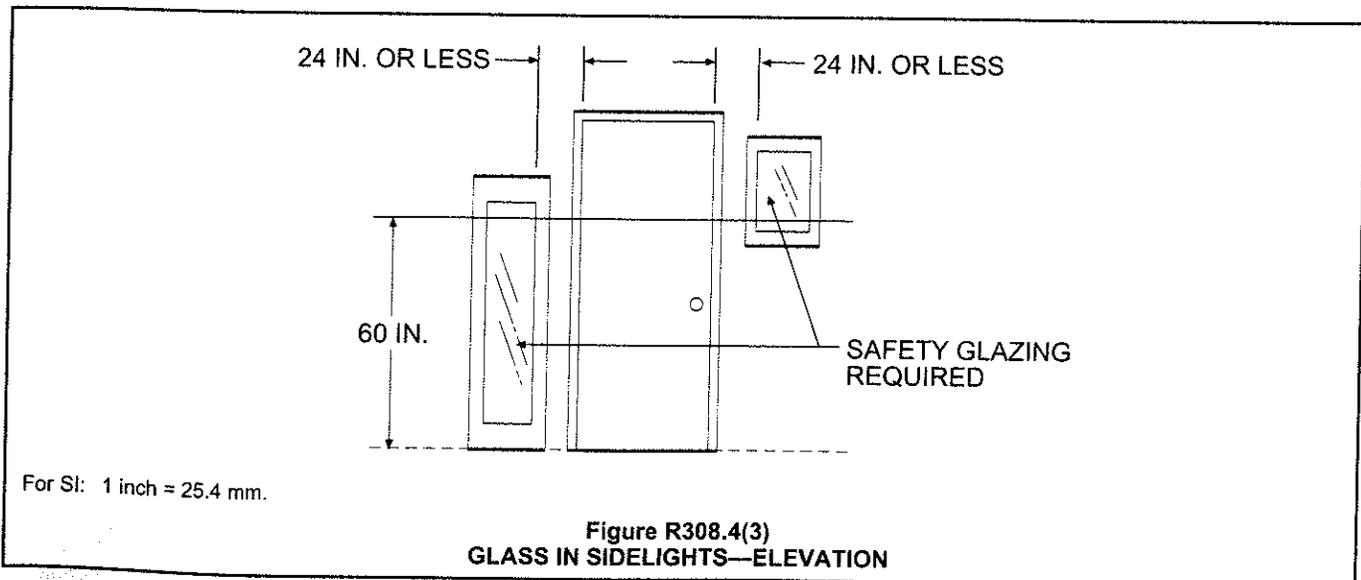
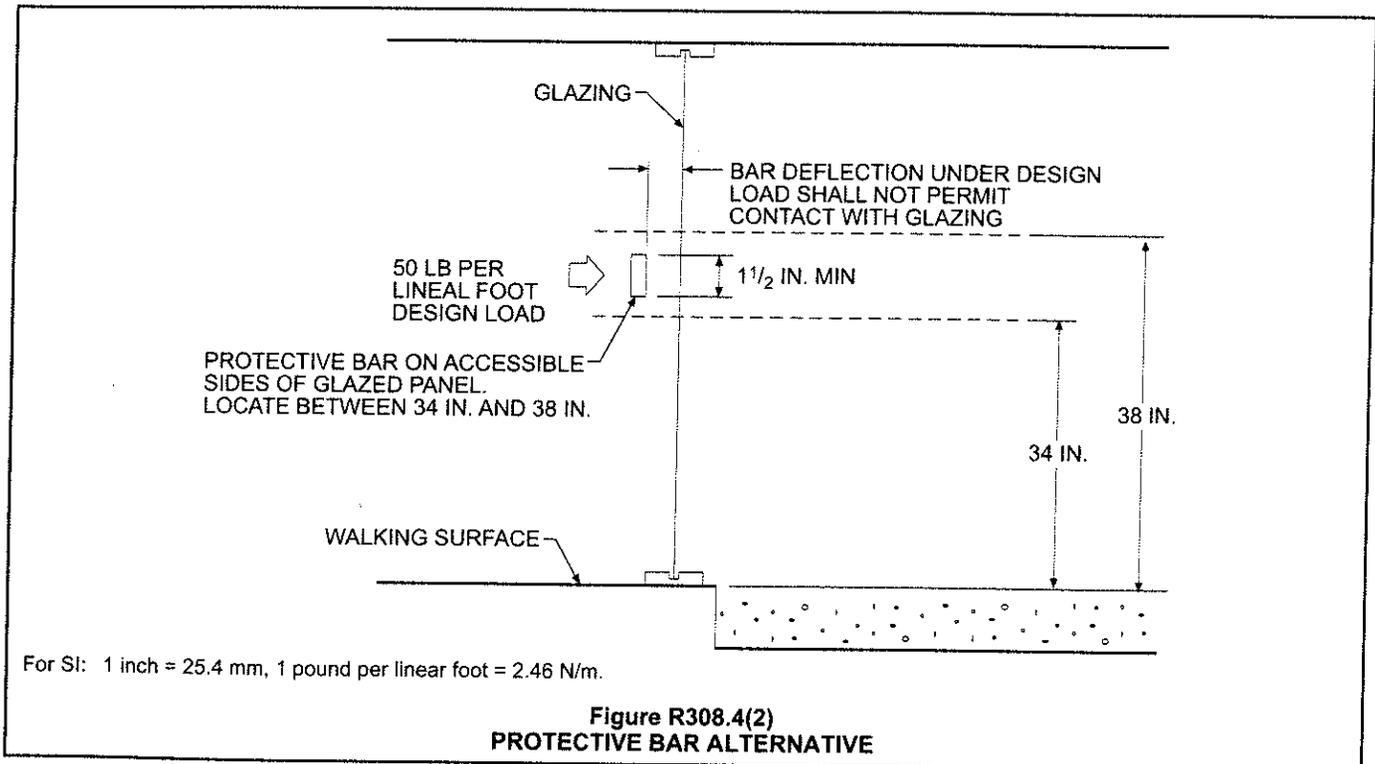


3.4. One or more walking surfaces must be within 36 inches (914 mm), measured horizontally from the glazed panel.

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) 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 Item 1. Most ingress and egress doors (except jalousies in accordance with Exception 1 to Section R308.3), unframed swinging doors and glazing in storm doors require 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 Item 1, Exception 1), as are assemblies of leaded, faceted or carved glass used for decoration (see Item 1, Exception 2). The latter exception applies to not only doors but also to sidelights and other glazed panels (see Item 2, Exception 1).



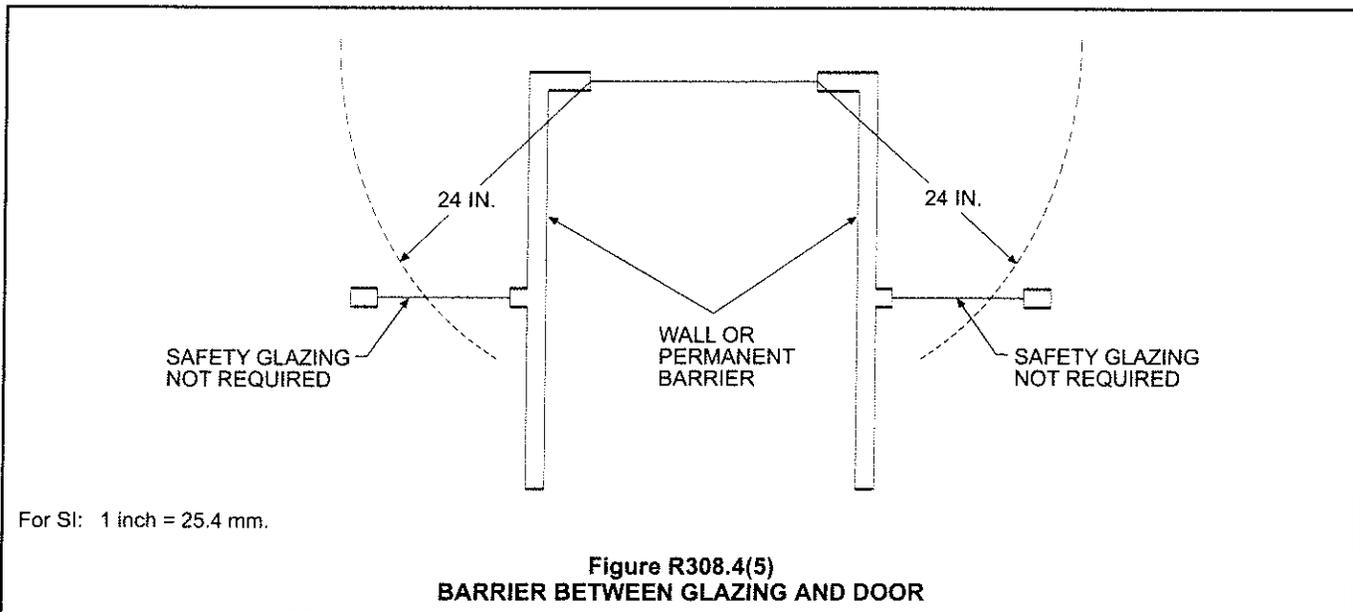
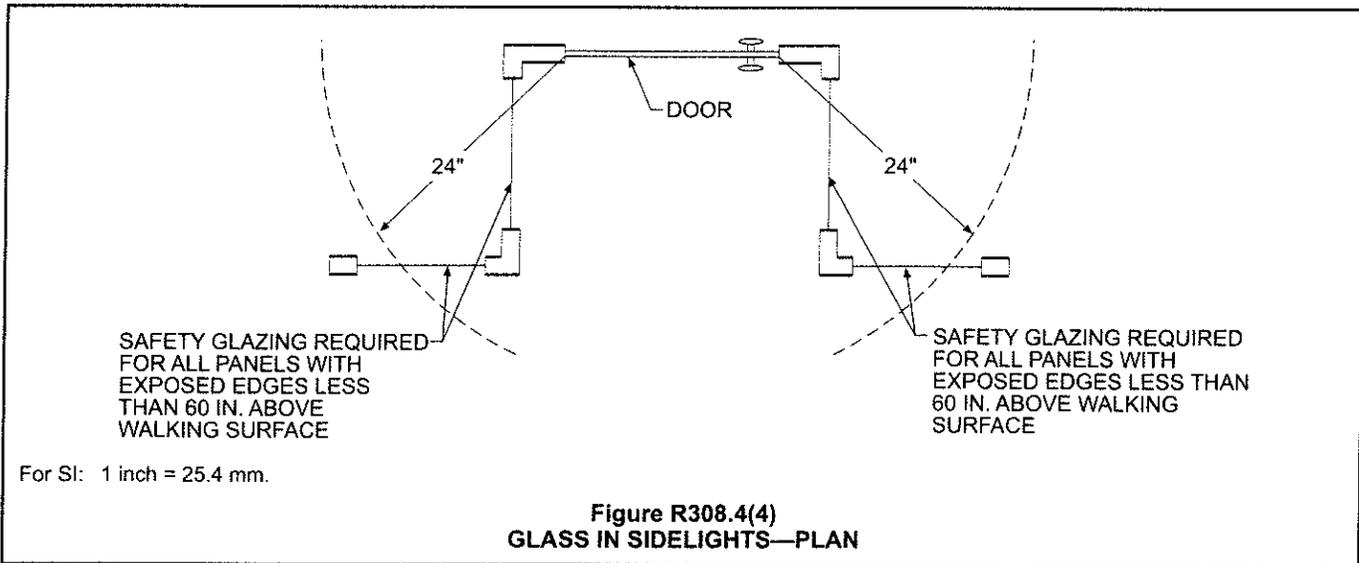
Glass in railings, balusters panels and in-fill panels, regardless of their height above a walking surface, require safety glazing (see Item 4). Because of the high probability that people will strike guards, it is critical that an increased level of protection be provided.

Commentary Figure R308.4(7) illustrates the condition where a window occurs within a shower enclosure (see Item 5). If this window is less than 60 inches (1524 mm) above a standing surface, safety glazing would be required. This same requirement applies not only to showers, but also to windows installed adjacent to hot tubs, whirlpools, saunas, steam rooms and bathtubs. Because of the presence of moisture, all of these locations represent slip hazards and need safety glazing to prevent injury in case of a fall.

Commentary Figure R308.4(8) illustrates the requirements of Item 6. This provision applies to walls

and fences used as barriers for indoor or outdoor swimming pools, hot tubs and spas. Before safety glazing is required, the bottom of the glazed panels must be lower than 5 feet (1524 mm) above the decking for a pool or spa.

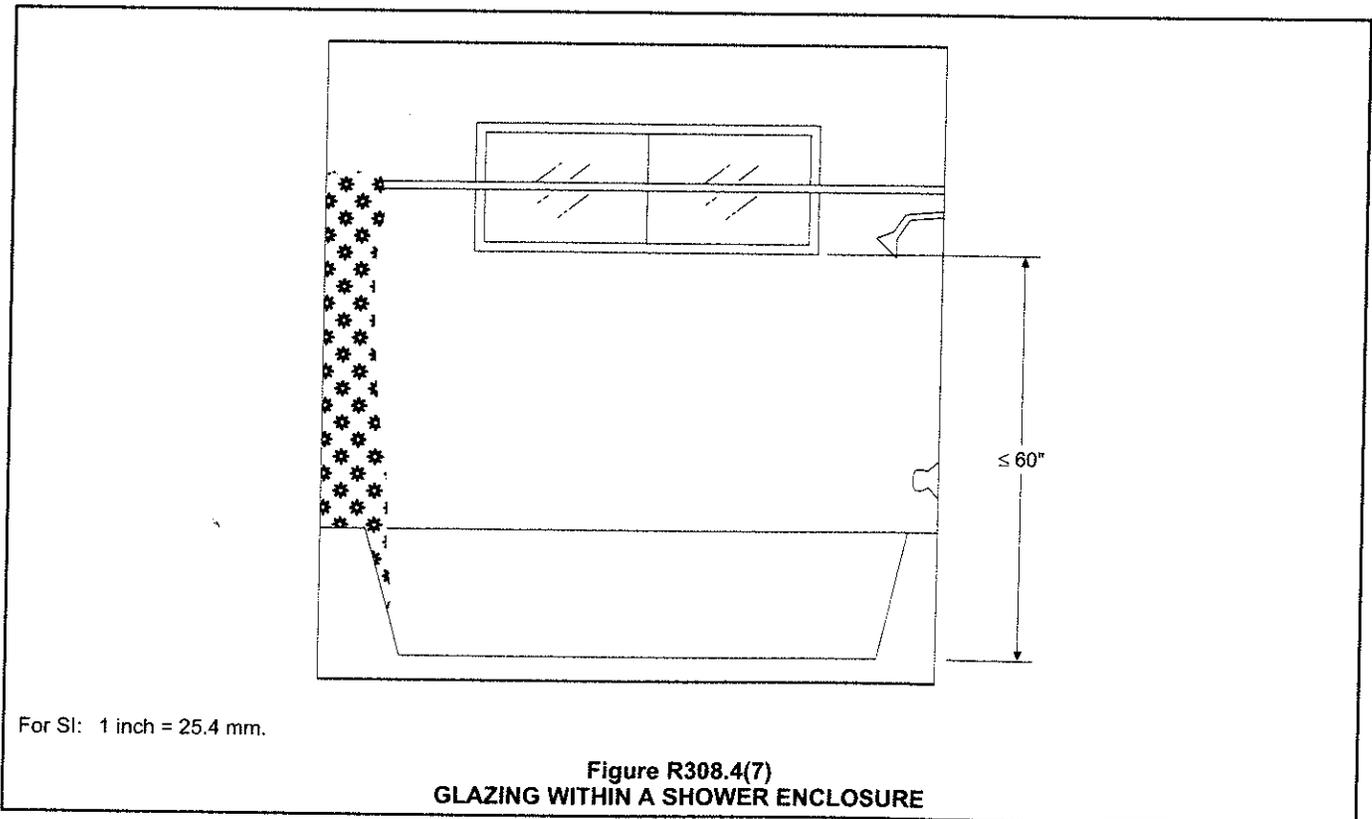
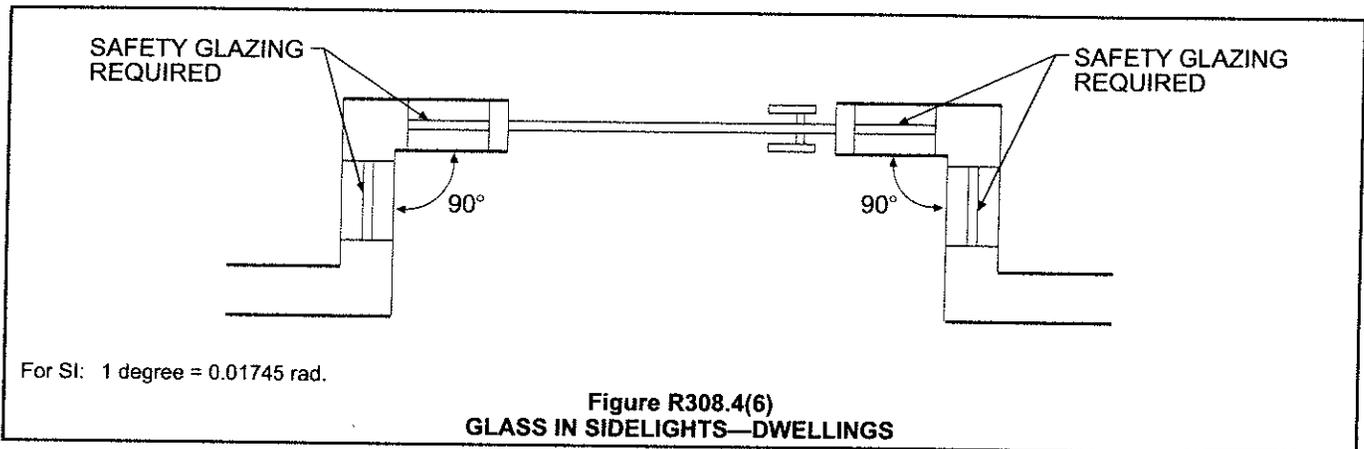
Items 7 and 8 address the hazardous locations to be considered for stairways, landings and ramps. Stairways and ramps present users with a greater risk for injury caused by falling than a flat surface. Not only is the risk of falling greater when using a stair, but the injuries are generally more severe. 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 re-

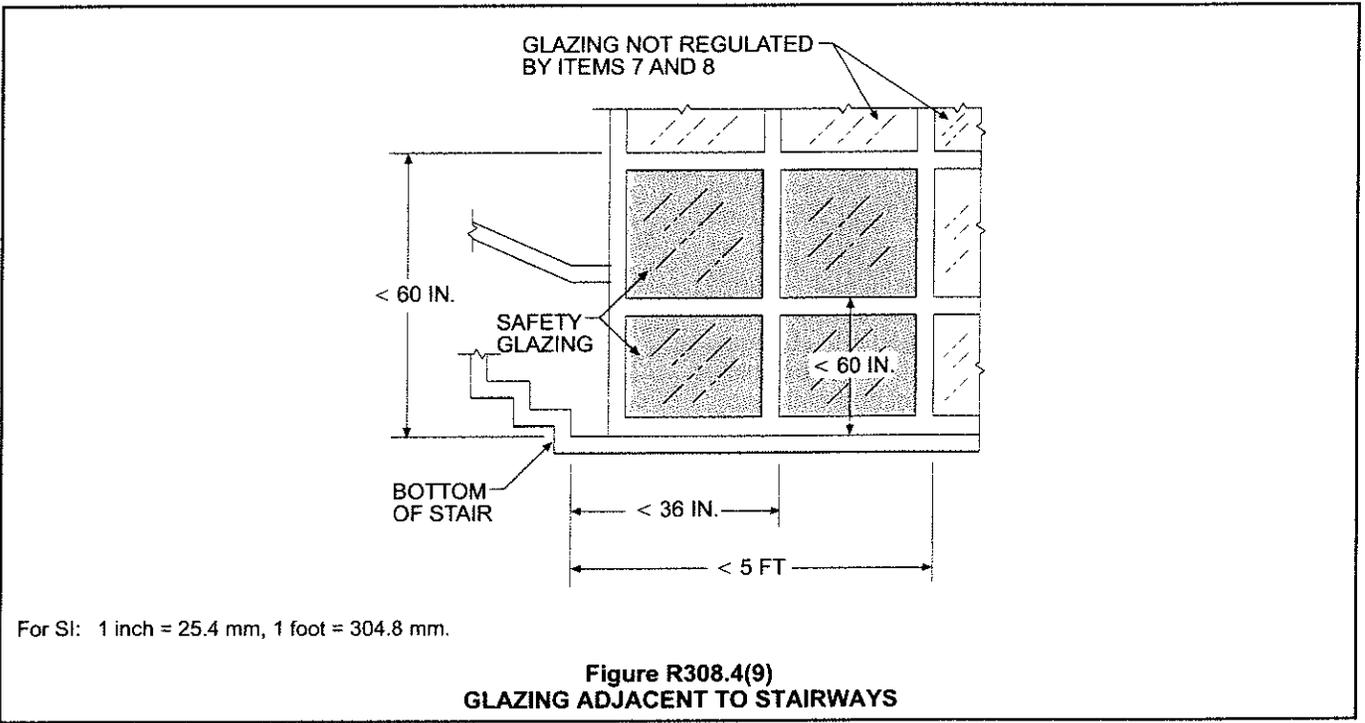
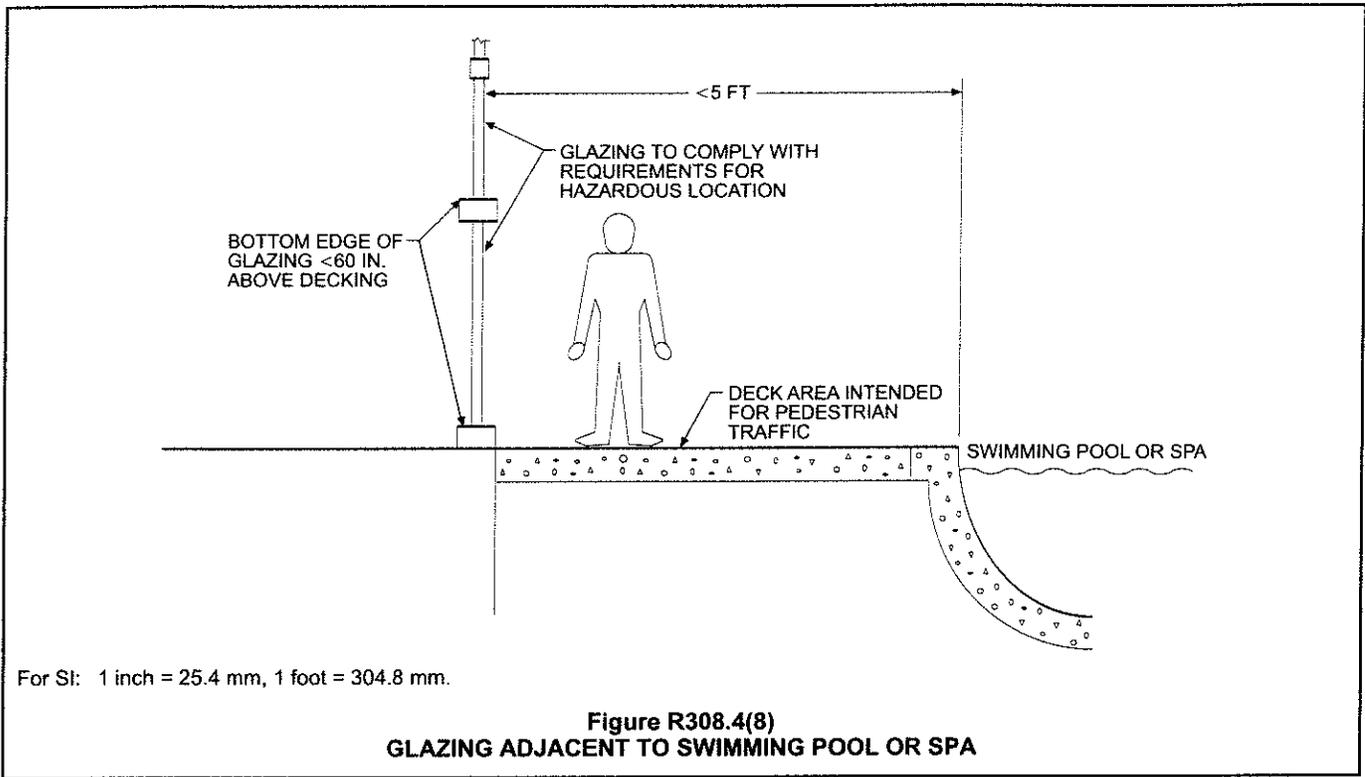


quirements when addressing safety issues involving stairways and ramps, account for the more restrictive requirements for glazing in and around stairways and ramps. Item 7 includes any glazing within 36 inches (914 mm) horizontally of any walking surface when the exposed surface of that glazing is within 60 inches (1524 mm) of the walking surface. The walking surface in question would be part of a stair or ramp itself, including top, bottom and intermediate landings. It does not include adjacent floors or other walking surfaces [see Commentary Figure R308.4(9)].

In Item 8, the concern is any glass that may be located within 60 inches (1524 mm) from the bottom tread in a run of stairs and within 60 inches (1524 mm) vertically of the walking surface of a stair. The code does not distinguish between a bottom tread at the pri-

mary floor level or at an intermediate landing. The last tread in a flight of stairs is the bottom tread. The 60-inch (1524 mm) dimension is from any point on the bottom tread, horizontally in any direction to any surface of any glazing within that range. Safety glazing is not required for Items 7 and 8 where (1) the side of the stairway, landing or ramp has a rail, which can be part of the guard or handrail, which 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); (2) the actual plane of the glazing is located at least 18 inches (457 mm) from the handrail or guard; and (3) a solid wall or panel extends to cover the area between 34 and 36 inches (863 and 914 mm) above the landing that can take the same load as a guard (see Table R301.5).





**R308.5 Site built windows.** Site built windows shall comply with Section 2404 of the *International Building Code*.

❖ Because site-built windows are not constructed in a manufacturing facility that follows industry standards, they must be constructed in accordance with Section 2404 of the IBC, which sets forth the wind, snow, seismic and dead loads on glass.