

## Safety Glazing for Safer Decks

by Glenn Mathewson

The completed deck is beautiful and your client loves it. It just needs to pass inspection, then you can move on to the next job. No worries — it's a simple deck and there shouldn't be any problems. But when the inspector does the final inspection, he tells you it looks great — except you must “safety glaze” a window on the house.

What? You didn't do anything to that window, so how are you responsible? I can tell you that you're not the only deck builder to be surprised by this code requirement. As an inspector, I often see designs that don't account for the locations of the existing windows.

Windows are typically made from glass, or what the building codes call glazing, which is dangerous when broken. Thus, Section R308 of the 2006 International Residential Code calls for safety glazing in locations it deems hazardous.

The safety glazing must display a manufacturer's designation, commonly called a “tempering bug,” that specifies who applied the designation, what type of glazing was used, and which safety standard was met. Further, the tempering bug must be acid- or laser-etched, sandblasted, ceramic-fired, embossed, or otherwise applied so it can't be removed without being destroyed in the process; and it must be visible at final inspection.

The most common safety glazing is tempered glass, like that used in the side and rear windows of your truck. It shatters into small pieces, which are much less likely to cause injury than a big pane of broken glass.

Section R308.4 of the 2006 IRC specifies 11 different “hazardous locations” where safety glass is required; relevant to deck building are glazed areas near walking surfaces, stairways, doors, and hot tubs.

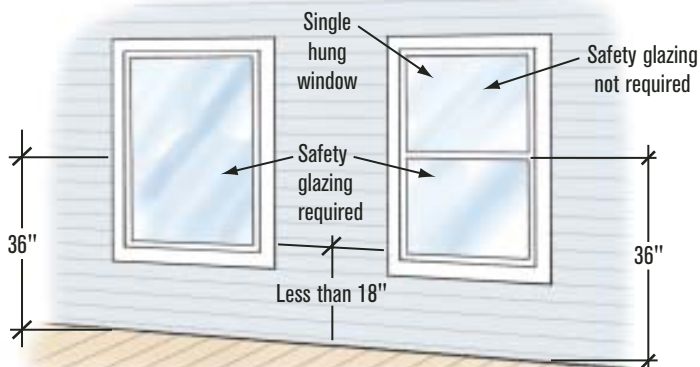
In all these locations, each individual pane of glazing is considered separately. The area, dimensions, and location of each pane are considered exclusive of the window frame or sash, and of the sum of the areas of the other panes in the same window assembly. It's not uncommon to have a single window assembly of multiple panes in which only select panes are required to be safety glazed.

### Walking Surfaces

A glazing location may be considered hazardous by the IRC if it is within 36 inches, measured horizontally, of a walking surface. A deck is exactly that — a walking surface — and if it adjoins the house, it's likely to be within 36 inches of a window or glazing. When that glazing meets all the criteria in the illustration below, it must be safety glazed.

There are a couple of exceptions that allow regular glazing. The first is for “decorative glass,” defined by the 2006 IRC as: “A carved, leaded or Dalle glass or glazing material whose purpose is decorative or artistic, not

### Adding a Deck Might Require Changing the Windows

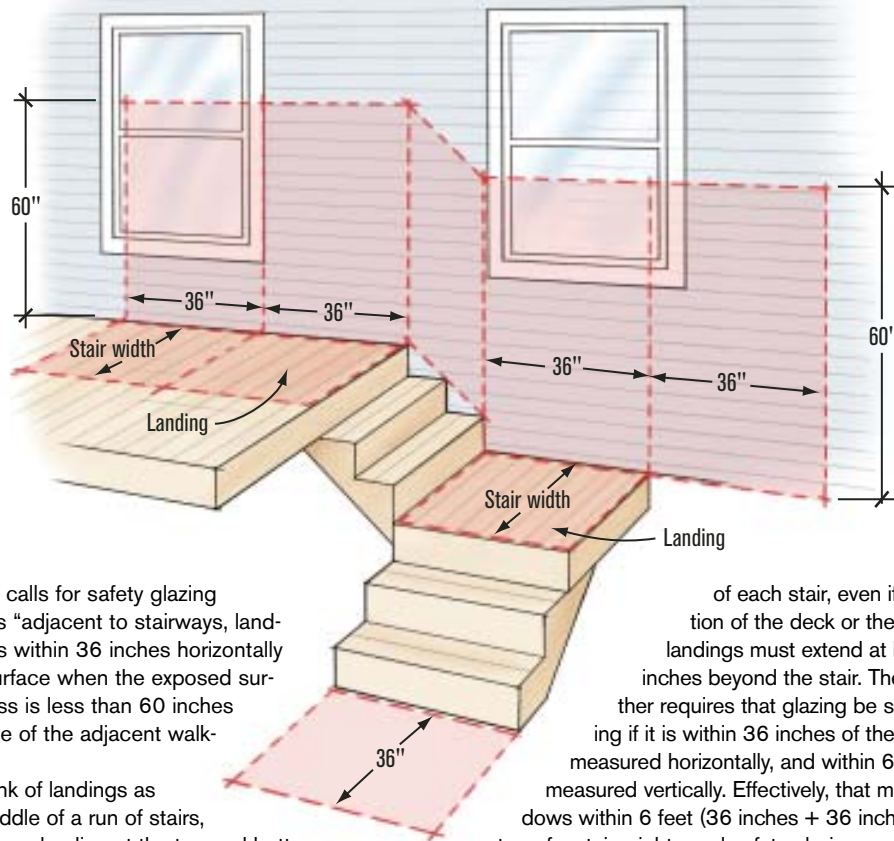


The 2006 IRC requires safety glazing when all four of these criteria are met:

1. Exposed area of an individual pane larger than 9 square feet.
2. Bottom edge less than 18 inches above the floor.
3. Top edge more than 36 inches above the floor.
4. One or more walking surfaces within 36 inches horizontally of the glazing.

Each pane is considered individually, so it's possible that the bottom pane of a single- or double-hung window would need to be safety glazed, while the top would not.

## Safety Glazing Required Near Stairs



The 2006 IRC calls for safety glazing when glazing is "adjacent to stairways, landings and ramps within 36 inches horizontally of a walking surface when the exposed surface of the glass is less than 60 inches above the plane of the adjacent walking surface."

While we think of landings as being in the middle of a run of stairs, the IRC requires a landing at the top and bottom

of each stair, even if it's a portion of the deck or the lawn. Such landings must extend at least 36 inches beyond the stair. The code further requires that glazing be safety glazing if it is within 36 inches of the landing, measured horizontally, and within 60 inches measured vertically. Effectively, that means windows within 6 feet (36 inches + 36 inches) of the top of a stair might need safety glazing.

functional; whose coloring, texture or other design qualities or components cannot be removed without destroying the glazing material; and whose surface, or assembly into which it is incorporated, is divided into segments." In short, "stained glass."

The other exception applies if a protective bar, a minimum of 1½ inches thick, is installed on the accessible side of the glazing. The bar must be at a height between 34 inches and 38 inches above the walking surface and cannot contact the glass when a 50-pound per linear-foot horizontal load is applied.

Before relying on any code exception, always consult the governing building department, as exceptions

can be subjectively interpreted.

### Stairways

Stairs are inherently dangerous; people slip and fall on them. Because of this, safety glazing must be used when the glazing is adjacent to a stairway.

The IRC defines stairways as any elevation change of one or more risers, and includes landings in its definition. All stairways, even those consisting of a single step, require top and bottom landings that are the width of the stairs and extend at least 36 inches in the direction of travel.

The landing does not have to be a separate component; it may be a portion of a larger walking surface. If the stairs ascend directly to the main area

of the deck, the portion of the deck that is the width of the stairs and runs 36 inches beyond the top nosing, measured in the direction of travel, is considered the "landing" (see illustration, above).

Another hazardous location with regard to glazing near stairs is the area within 60 inches of the bottom of the stairway (see illustration, below).

There are exceptions to these rules, also. As in areas adjacent to walkways, protective bars can be used to protect glazing within 36 inches of stairs and landings, unless the glazing is within 60 inches, measured horizontally, of the bottom tread.

Additionally, another exception implies that safety glazing is not

## STRUCTURE

required if the glazing is more than 18 inches beyond a guard (a wall or railing at least 36 inches high, with balusters or infill spaced at most 4 inches apart, all of which must resist a 200-pound load from any direction). This exception can be applied to both hazardous stairway locations, but it isn't clearly presented, and I recommend you check the local building department's interpretation of it before using it in your design.

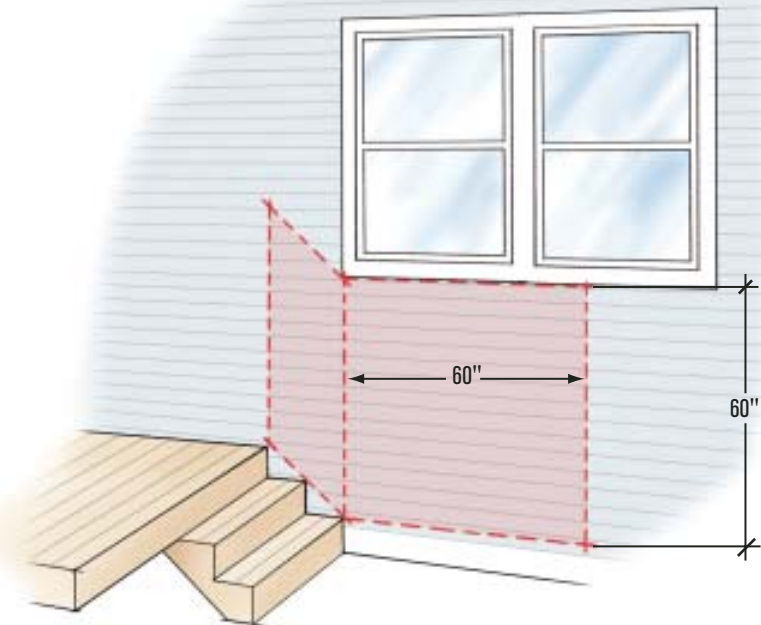
Glazing used in all guardrails – both level and on stairs – must also be safety glazing.

### Doors

Homeowners may wish to have a door installed leading to their new deck, often a simple matter of reframing an existing window opening. You may not even have to change any structural components of the wall, like the header or trimmer-king studs. Easy, right? By now, it should come as no surprise that there are other things to consider, one of them being glazing near the future door.

Glazing that is within a 24-inch arc of a door jamb and whose lowest point is less than 60 inches above the walking surface must be safety glazing. The illustration below shows how the arcs are measured. The exception

### Bottoms of Stairways Have Their Own Requirements

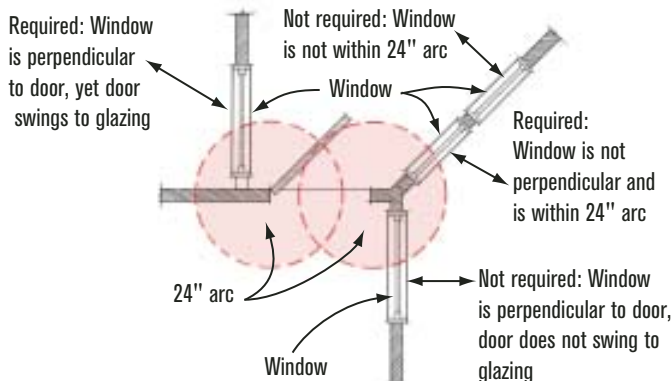


The 2006 IRC calls for safety glazing when glazing is "adjacent to stairways within 60 inches horizontally of the bottom tread of a stairway in any direction when the exposed surface of the glass is less than 60 inches above the nose of the tread."

There are two important aspects of this section to pay attention to. First, it clearly states "any direction." The literal words of the code are the requirements and could be enforced as such. Despite how irrational, even glazing within 60 inches horizontally behind and below the stair would fall into this area.

Second, the 60-inch height is measured above the nose of the tread, so you must include the height of the first rise when measuring off the floor or landing at the base of the stairway. For example, consider steps with 7-inch rises: If you measure horizontally 60 inches from the nose of the last step, as specified by the code, you actually need to measure 67 inches vertically from the landing below to determine the need for safety glazing.

### Adding a Door? Check Nearby Windows

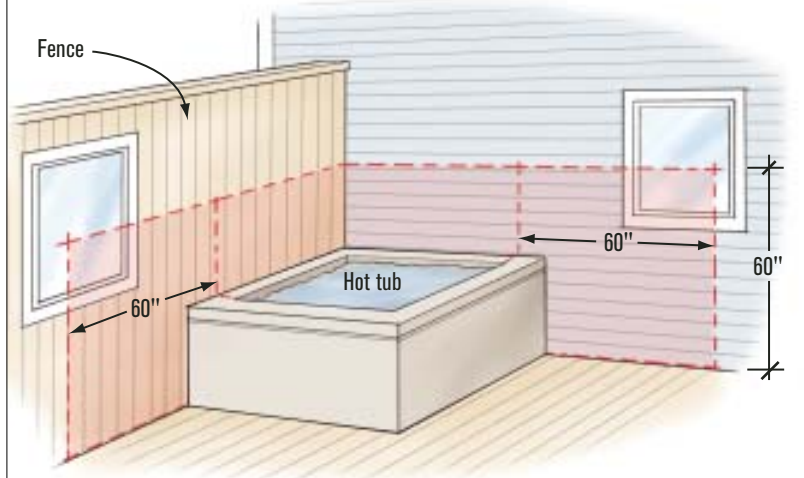


The 2006 IRC calls for safety glazing when glazing "is in an individual fixed or operable panel adjacent to a door where the nearest vertical edge is within a 24-inch arc of the door in a closed position and whose bottom edge is less than 60 inches above the floor or walking surface."

This section is not easily understood. Imagine attaching one end of a 24-inch-long string to the corner of the door jamb, then pulling the free end in a horizontal arc. Any glass less than 60 inches above the floor and within the reach of the string would need to be safety glazed.

Arcs are measured from both door jambs, on the inside and outside – four places. In the case of a sliding glass door, the whole assembly is considered the "door": You would not measure from the edges of only the operable panel, but from the edge of the inoperable panel as well – in other words, the edge of the door assembly.

## Pools, Hot Tubs, and Spas Need Safe Glass



The 2006 IRC calls for safety glazing when glazing is “in walls and fences enclosing indoor and outdoor swimming pools, hot tubs and spas where the bottom edge of the glazing is less than 60 inches above a walking surface and within 60 inches horizontally of the water’s edge. This shall apply to single glazing and all panes in multiple glazing.”

This is probably the simplest section. There are no exceptions – glass near wet areas must be safety glazing.

for decorative glass, as previously defined for areas adjacent to walkways, can also be used to exempt glazing within the 24-inch arcs of the door jambs.

### Pools, Hot Tubs, and Spas:

It’s no secret that water makes floors and decks slippery, and that the floor around pools and hot tubs is usually wet. Any glazing within 5 feet, measured horizontally, of the water’s edge and less than 5 feet above an adjacent walking surface is required to be safety glazed – there are no exceptions to this requirement (see illustration, above).

When designing for a hot-tub or spa location, always remember the “rule of 5,” five items that, in general, must be at least 5 feet away: glazing, lighting, receptacles, switches, and

unbonded-metal objects subject to becoming inadvertently energized (such as guardrails or barbecues).

Code sections are not always easy to understand, which often causes inconsistency in enforcement among jurisdictions. I encourage you to include the location of all glazing on the construction documents you submit for a permit. This gives the plan reviewers a chance to redline any glazing that may be subject to safety glazing. You will then be able to incorporate these requirements into your construction process or alter your design, rather than learning about them when your job is complete. ❖

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