

International Building Codes and “The Ladder Effect/Climbability”

There has been much discussion over the years about the safety of horizontal infill on guardrails because of what is perceived as the “ladder effect” that horizontal or decorative infill patterns create. In fact, the first edition of the International Code Council’s (ICC) Residential Building Code (IRC), issued back in 2000, included wording that restricted the use of horizontal and decorative patterns. However, the International Code Council’s Code Technology Committee (CTC), after detailed research and discussion with industry experts, removed the “ladder effect” wording a year later in the first IRC Supplement issued in 2001. And any wording referring to “ladder effect” has never returned. It’s also important to note, that the ICC’s Commercial Code (IBC) has never had any wording that restricted the use of horizontals or decorative infill patterns.

The exact wording of past and current Residential Building Codes (IRC) is as follows:

IRC first edition 2000 (included restrictions)

R316.2 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-in (102mm) in diameter. **Required guards shall not be constructed with horizontal rails or other ornamental pattern that results in a ladder effect.**

Exception: 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-in (152mm) cannot pass through.

IRC first supplement 2001 (“ladder effect” wording removed)

R316.2 Guard opening limitations. Required guards on open sides of stairways, raised floor areas, balconies, and porches shall have intermediate rails or ornamental closures which do not allow passage of a sphere 4-in (102mm) 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-in (152mm) cannot pass through.
2. Openings for required guards on the sides of stair treads shall not allow a sphere 4-3/8-in (107mm) to pass through.

Current IRC 2012 (“ladder effect” wording still gone)

R312.2 Guard opening limitations. Required guards shall not have openings from the walking surface to the required guard height which allow passage of a sphere 4-in (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-in (153 mm) in diameter.
2. Guards on the open side of stairs shall not have openings which allow passage of a sphere 43/8-in (111 mm) in diameter.

Please note, even with the above changes to the International Residential codes, every code jurisdiction is different, and some may still be relying on the earlier 2000 code interpretation. Therefore, it is important for architects, fabricators, contractors, and home owners to confirm local codes as related to the railing products they choose to install.