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Infinity Railing Code Compliance

Per IBC / IRC including states: Washington, Oregon, Idaho, Montana and California

As stated in the Effective Use clause introducing the document, The International Residential Code for One- and Two-Family Dwellings (IRC), is limited to, "*All buildings within the scope of the IRC are limited to three stories above grade plane. For example, a four-story single-family house would fall within, the scope of the International Building Code (IBC), not the IRC.*"

The Infinity Rail becomes a code compliance issue when the railing is intended to be used as a guard. Guards are required per IBC 1013.1, "*along open-sided walking surfaces, including mezzanines, equipment platforms, stairs, ramps and landings that are located more than 30 inches (762 mm) measured vertically to the floor or grade below at any point within 36 inches (914 mm) horizontally to the edge of the open side. Guards shall be adequate in strength and attachment in accordance with Section 1607.7.*"

Prior to the 2009 revision to the International Building Code (IBC), installing a glass guard without a top rail acting as the guard was not permissible. The 2006, 2009, and 2012 editions of the IBC specifically states in Section 2407.1.2, "*Glass balusters shall not be installed without an attached handrail or guard.*" Although not as explicitly prohibited in the IRC, glass guardrails without a top rail do not have a specific code compliant path to adhere in the IRC.

An interpretation received from the International Code Council (ICC) that authors and manages the I-Codes states that per the IRC, there is no requirement for a top rail to be included, however such must be approved by the building official.

As outlined in SECTION 104 DUTIES AND POWERS OF THE BUILDING OFFICIAL, in both the IBC and IRC, the Building Official can approve an 'alternative material, design or method of construction' that they find to be 'satisfactory and complies with the intent of the provision of this code.' Construction under the scope of the IRC have had more allowances for glass guards without a top rail prior to 2009 adopted codes.

The 2009 revision of Section 2407 in the IBC, now allows for no top rail as an exception. Note that the language states 'when approved by the building official.'

2407.1.2

Exception: *A top rail shall not be required where the glass balusters are laminated glass with two or more glass plies of equal thickness and the same glass type when approved by the building official. The panels shall be designed to withstand the loads specified in Section 1607.7.*

In both the IBC and IRC, glass used as infill panels in handrails and guards is limited to single fully tempered glass, laminated fully tempered glass or laminated heat-strengthened glass. Per IBC, glass as guards without a top rail is further limited to one of the laminated configurations.

In summary, the IBC requires a factor of four to be applied to glass components in a handrail or guard assembly, this safety factor includes the 200 lbs. point load applied to the guard (per 1607.7) thus equaling a 800 lbs. load on the top edge of the glass guard. The loading requirement is mirrored in the IRC (Table R301.5), but the laminated glass requirement for glass without a top rail does not carry over to the IRC.

CrystaLite's Infinity Railing System has been independently tested by National Certified Testing Laboratories (NCTL). Testing included glass options of 3/8" tempered and 7/16" fully tempered laminated installed in 42" tall railing systems and both have successfully passed point load testing exceeding the IBC/IRC requirements. The testing has been reviewed by an independent structural engineer with licenses for Washington, Oregon, and California.

Currently, Washington, Oregon, Idaho, Montana and California have adopted revisions to their state codes which accepts the 2009 IBC/IRC code revisions addressing glass guardrail systems. CrystaLite's Infinity Railing System is code compliant in these states. Note that these states are in the process of reviewing the 2012 editions of the I-Codes for adoption. The current and un-amended language remains the same regarding glass without a top rail, only referenced section numbers will shift.

California has amended Section R312.2 of the 2009 IRC, which raised the minimum height of the guard from 36 inches to mirror the IBC minimum height of 42 inches.

All final decisions of code compliance are at the discretion of the local building authority. Always ensure approval by the local authority prior to installation. CrystaLite can provide test reports and engineering analysis for all our railing systems, including Infinity Railing.