

BY GLENN MATHEWSON

## Replacement Windows and the Code

**The IRC and the window** replacement industry have not been friendly to each other or to building officials, contractors, and homeowners for quite a long time. Besides the codes that govern installation practices, the reason for this animosity has to do with the four major aspects of code compliance that deal with windows: energy conservation, safety glazing, fall protection, and emergency escape/rescue.

For the first two aspects, the requirements for replacement windows in existing framing are the same as those for new windows in new framing. That is, energy codes limit the U-factor and solar-heat-gain coefficient, and if the window is located in one of seven locations deemed "hazardous" by the IRC, then it must be safety glazed, typically using either tempered glass or security film. These both impact the consumer mainly in the cost of the window itself.

Code compliance surrounding the latter two aspects—fall protection and emergency egress—involves the openings in the wall, however, and

not just the windows. The code is vague as to how best to apply new provisions in existing homes built under less-stringent code regulations. Lacking clear guidance from the IRC, many jurisdictions are reluctant to take into consideration much beyond these two safety issues. As a result, many homeowners are stunned to discover that updating to more energy-efficient windows will require complete wall remodeling to meet egress requirements as well, something that their budgets might not allow for.

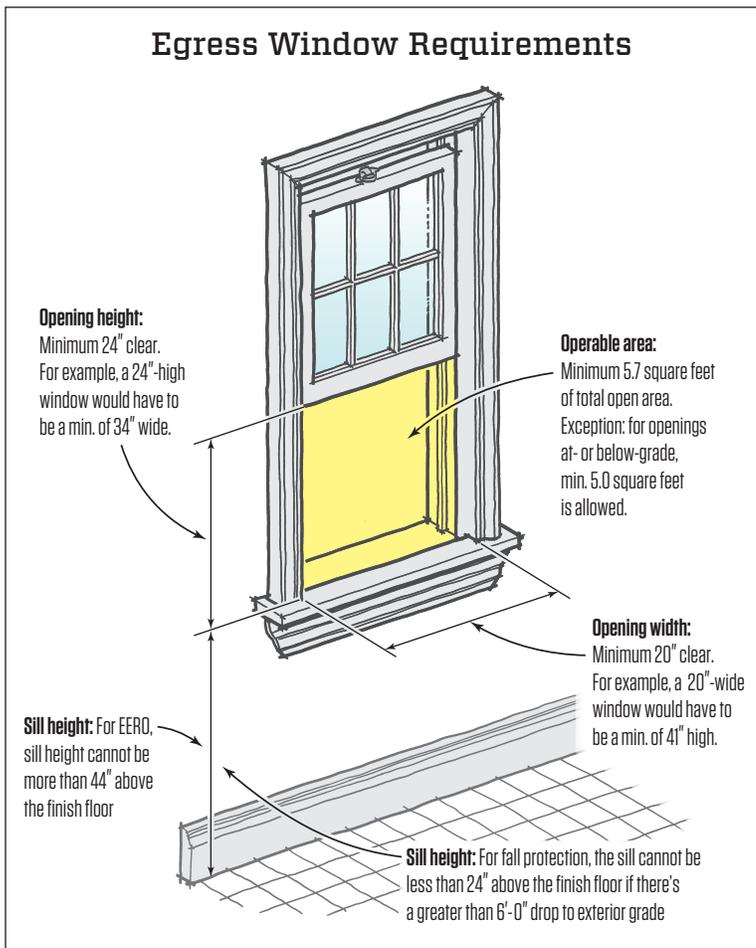


Illustration by Tim Healey

### EMERGENCY ESCAPE AND RESCUE OPENINGS

Provisions for emergency escape and rescue openings (EERO) entered as a minimum code standard in the 1960s and have evolved since then. In the latest version (2015 IRC), EERO finished sill heights cannot be more than 44 inches above the finished floor. In addition, windows must open no less than 20 inches wide or 24 inches high, with no less than 5.7 square feet of total open area (although an exception is made for at-grade or below-grade openings: Total open area must be at least 5 square feet).

It's important to note that an opening cannot be *both* the minimum width and the minimum height—and still meet the minimum area requirement. For a replacement window in homes built prior to enactment of these minimum dimensions, many building officials will not allow installations that don't meet today's code for an EERO. The only way to install new windows is to completely remodel (enlarge or lower) the opening in the wall. This could mean structural work such as enlarging the header, drywall finish work on the inside, and modification of the exterior siding or perhaps brick—work that can cost more than the windows themselves.

For owners with limited budgets, this means being stuck with their old, inefficient windows. The unfortunate irony (discussed at a recent code hearing) is that older windows may not be operable at all, because they're damaged or painted shut. In those cases, even a noncompliant new window would be safer than what's there.

### FALL PROTECTION

Another provision affecting window sill height corrects a problem that arose with the 2009 IRC: That version of the code required that an operable window with a sill height of less than 24 inches above the floor be no greater than 6 feet above the grade

outside the window. The purpose of this provision is to protect young children (under 5 years old) from severe injury if they fall through an open window with a low sill. When applied to replacing a low operable window in an older home, this requirement begged the question of what should be "grandfathered in."

Recognizing the problem, the 2015 IRC offers some relief. The only catch is that the provisions are located in Appendix J, titled "Existing Buildings and Structures," and must be adopted specifically into the governing ordinance. Though not yet in primary chapters of the IRC, Appendix J is still a major step in the right direction as

new code applies. But if you remodel an existing bedroom, and it stays a bedroom, then the windows do not need to be enlarged.

#### WINDOW STYLE AND MATERIAL

Window material or style can also have an impact on what's allowed. Replacing an old aluminum-frame window with a vinyl window of the same size and style often results in a smaller opening because of the thicker vinyl frame and mullion. Many code authorities have addressed this issue by requiring a different style window to increase the opening size, such as a casement window in place of a slider. While

have more than a 6-foot drop outside are now in violation of the code. This provision is intended to keep children 5 years old and younger from falling out an open window while they are standing on the floor.

In this case, Appendix J offers relief in the form of fall-prevention devices—such as screens or gates that meet ASTM test standard F 2090—placed in front of an opening. The provision also allows control devices that prevent windows from opening more than 4 inches. Approved devices can block the fall of a child under 5, yet can also be removed easily for egress by someone smarter than a 5 year old. They are the only

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a recalibration of the balance between ideal life safety and the reality of our varied existing-home stock.

#### ENTER "APPENDIX J"

Under the provisions of Appendix J, a replacement window functioning as an EERO does not have to comply with the maximum 44-inch sill height or the minimum-opening-size requirements, but with some strict caveats. First, this doesn't mean that a smaller window can be installed; rather, it means that if the existing windows are not low enough, the wall does not need to be modified to set the new window at a lower sill height.

Also this rule applies only if there is no change in occupancy of the space. If you remodel a dining room into a bedroom, you are changing the intended occupancy of the space, and a fully-compliant EERO window must be installed. If you build a bedroom in an unfinished basement, you are changing its use, and the

this may satisfy the opening requirements of the building code, it is often at odds with planning commissions, zoning boards, or homeowner associations that require matching window types.

The 2015 Appendix J addresses this issue by allowing use of the chosen manufacturer's largest standard-size window (largest openable area) that fits an existing wall opening. That window can be either the same style or a different style. No longer must remodelers stress over the size difference between an aluminum frame and a vinyl frame, or over having to install a casement window or slider in place of a double-hung.

#### EERO VS. FALL PROTECTION

In contrast to the need to lower the sill height of a window opening for an EERO, sometimes the need is to raise it for fall protection. In an existing home, operable windows that have finished-sill heights less than 24 inches and

code-compliant methods—that is, short of building a new deck outside the window to reduce the fall height to less than the 6-foot maximum allowed by the IRC for windows (replacement or new) with open sill heights below 24 inches.

These new provisions should have a positive effect on the window replacement industry and on owners in jurisdictions that adopt them.

I encourage window replacement contractors to prepare in two ways. First, take part in your local HBA or other industry association represented in local politics and legislation, calling for them to adopt Appendix J. Second, become familiar with fall-protection options and be prepared to educate and offer your customer these code-required devices for the windows that need them.

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