What's Ahead for Decks in the 2024 IRC

by Glenn Mathewson

In the April issue of *JLC*, I discussed some of the major new provisions that are being included in the 2024 edition of the International Residential Code. In that article, I focused on the changes that are most likely to affect general contractors and remodelers; here, I'll focus on the new provisions that deck builders will need to be aware of.

Beam sizing. Since 2015, deck design codes have been closely scrutinized and modified with each new edition of the IRC, including the most recent, and soon to be published, 2024 IRC. For example, the relationship of joist back span to joist cantilever, and then joist cantilever to beam span, has been a complicated one to present in pre-engineered design tables. This is due to the fact that the length of a joist cantilever affects the load on the beam supporting the joist, and thus the maximum span of the beam.

Previous editions of the IRC simplified this relationship in the beam sizing table by assuming that all cantilevered joists extended the maximum length allowed beyond the beam. When there was no joist cantilever, however, beams were being greatly oversized and thus overpriced. In 2021, the IRC included a cumbersome method that allowed the values in the table to be adjusted using a modifier value based on the ratio of joist span to cantilever. That sentence alone is cumbersome, so imagine the code. While this method did allow users of the beam sizing table in the IRC to more accurately size a beam, a new approach was approved for 2024.

In the new beam sizing table, the heading of the beam span tables where the "joist span" (with fully assumed cantilever) is listed was expanded to reveal combinations of span and cantilever that would result in the same beam load. For example, the column for "10-foot span" in the 2021 IRC was changed in 2024 to show the column works for a 10-foot span and 2 1/2-foot cantilever, or a 12-foot span and 1-foot cantilever, or a 14-foot span with no cantilever.

Ledgers. The first prescriptive design provisions for decks appeared in the 2009 IRC; they were about ledger connections. Addressing the well-known issue of ledger failures from nailed connections was the intent, and including prescriptive details in the code has provided the country with much-better-connected decks over the last decade.

However, a connection is only as strong as the two components that are being connected, and the IRC has never provided guidance for flashing a watertight connection between the ledger and house to preserve the integrity of the wood materials, which won't hold a connection very well if they decay.

What the watertight flashing would connect to has also been a moving target. Do you flash behind the ledger or behind the water-resistive barrier? What if it's a rainscreen system? What if there's no WRB, as permitted in certain conditions in early editions of the IRC? Decks are attached to houses built with a variety of methods and materials, both current and outdated, and these questions are going to get their first round of standardized answers in the 2024 IRC.

The approach will be that the exterior wall covering—whether clapboard siding, stucco, brick, or something else—is the bulk water control layer, while the WRB is—as its name implies—the final water barrier. For this reason, the 2024 IRC will require that ledger flashing be tight to the WRB, when one already exists or in new construction. The flashing can lace shingle fashion into the WRB laps, or it can be sealed to the face of the WRB with a self-adhering membrane. This will allow the flashing to be installed at a separate time from the WRB and alleviate concerns many deck builders have about cutting into an existing WRB to lap it with their ledger flashing.

In existing construction without a WRB, a deck ledger is replacing the function of the siding, but a ledger supports human occupancy and siding doesn't. So, to protect the integrity of both the wall and the ledger connection, a WRB must be installed only in the area behind the new ledger and high enough that the ledger flashing can be sealed to the membrane. The flashing and the WRB must extend at least 2 inches above the top of the ledger and a self-adhering membrane strip must then be sealed over the 2-inch vertical flashing leg and sealed at least 2 inches onto the sheathing above the flashing.

When a rainscreen type of wall covering is installed and the ledger is spaced from the exterior wall to create a continuous drainage plane, the flashing does not have to seal or lace into the WRB, so it only goes behind the covering. When a ledger is installed with alternative methods (such as structural brackets) that space it from the wall covering by a minimum of 1/4 inch, flashing is not required at all.

Flashing can be placed behind the WRB in shingle fashion, with at least a 2-inch lap or can be sealed to the face of

the WRB with a self-adhering membrane. On the other edge, flashing must extend beyond the face of the ledger and down a minimum of 1/4 inch, but alternatively, it can extend horizontally and over the joists by a minimum of 4 inches beyond the ledger face. All shingle-fashion lapping must be at least 2 inches, but there are exceptions for when a door or window is directly above the deck. The window flashing can then integrate with and take the place of the deck flashing.

Decay resistance. Clarifications were made regarding when decay-resistant wood is required for different wood members of a deck. All joists, beams, posts, decking, and stair stringers must be decay-resistant, meaning either preservative-treated in accordance with the AWPA U1 standard, or a naturally durable species of wood. In Chapter 2, the 2024 IRC defines "naturally durable" species as being only redwood, cedar, black locust, or black walnut, with each piece having no more than 10% sapwood on each face. In theory, this controversial measure eliminates all the common hardwood decking species from use under the IRC, but it's unclear how it will actually affect the marketplace.

Selecting wood decking of the listed species under this clarification is likely to be a significant challenge, as it eliminates all sapwood grades of redwood and cedar from use in the residential decking market. B-grade redwood, for example, has much more than 10% sapwood and thus is not compliant as decay-resistant. However, there is an exception to this requirement in regions where climatic experience has demonstrated that decay resistance is not required. Talk to your building official. I expect this subject will come up again in the 2027 IRC proposals, as even those organizations that supported this change admit it may unnecessarily exclude many historically viable wood decking materials.

Stairs. The IRC has always required that all exterior stairs have a landing at their base that is at least as wide as the stairs, but without clearly specifying materials that the landing must be made from. On low-level decks where the deck stairs access grade, homeowners often want to have grass or gravel landings. However, per the IRC, a landing must have a surface stable and consistent enough to be a measurable surface that is limited to a 1/4:12 slope in most cases. This can create design issues when a ground-level deck has a couple of treads that wrap around the perimeter of the deck. If the local building department requires a hard surface landing, the owner may not be happy about having to replace 3 feet of lawn around the deck perimeter with a concrete or flagstone landing.

For this reason, the 2024 IRC includes a new exception for the bottom stairway width, specifically for exterior stairways serving a deck, porch, or patio (basically a backyard deck). If the stairway has three or fewer risers and if no handrail is required, the bottom landing can be only 36 inches wide. This exception does not apply to required egress doors.

Guards. Guards received some attention from the committee, thanks to the increased scrutiny of guard connections to decks and floors in the 2018 and 2021 editions of the IRC. This drove nailing down the deflection limit, as you can't fully evaluate guard connections without it.

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Generally speaking, deflection is the limiting factor in all structural designs, and the IRC provides deflection limits for various structural elements, such as floors and roofs, in construction. But how much can a guard deflect, and how do you measure it? This question has never been clearly answered in the IRC, partly because guards have typically been built in the field, without engineered plans or tested installation instructions.

As manufactured deck guards have become more popular, testing protocols have established deflection limits for products, but not for custom-built guards from wood materials. Those deflection limits aren't identified in the code, so they aren't universally applicable to all guards. There were a lot of ideas and discussion for how to address guard deflection in the IRC, but the proponents and the committee couldn't reach a consensus on how to evaluate it. As an interim measure, the 2024 IRC clarifies that the current deflection limits of L/240 for "all other structural members" does *not* apply to guards. This subject will have to be discussed again for the 2027 edition.

Many issues were addressed for the 2024 IRC; some were resolved, and others were not. Regardless, the IRC code development process is open to anyone to participate, so nothing is ever "settled," and everything can be revisited and revised with a simple proposal. I encourage professionals in the deck industry to make themselves familiar with the current, 2021 IRC and the changes soon to be published in the 2024 edition. With that baseline understood, new ideas can build on it. The future codes are decided by those who speak up and make themselves heard. ❖

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