Outdoor Safety

Deck Safety in the Age of Outdoor Living

By Glenn Mathewson, MCP, NADRA Technical Advisor

Safety. This is a subjective and relative word, and its meaning changes over time based on the comfort level and expectations of society. Published standards in building codes represent these expectations with each new edition.

The decking industry, however, has struggled with these expectations. Until the 2009 *International Residential Code*® (IRC), there weren't many published standards for deck construction. Our only basis for confidence in their construction previously was from historical, empirical, statistical and often local experience.

In the 1980s, square, wood platforms were the visage of the decking industry — simple and straightforward.

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An example of electrical and emergency egress clearances.

When I started building decks in the 1990s, there was little thought or attention given to them in a regulatory sense. They were built as they had always been built. But a new era was under way — an emerging era of outdoor living, composite technologies, complex and unique designs and owners looking for amenities and features well beyond what passed in the 1980s decks. This era has shaken how we perceive "deck safety," and it takes a number of factors into consideration.

Technology and Design

Today, there are hundreds of unique and proprietary deck products to choose from, all with unique properties. A browse through the North American Deck and Railing Association's (NADRA) searchable product database reveals a world of choices for consumers. All these products in some way affect deck safety. Decking is manufactured from various materials, incorporating plastics, woods and even recycled carpet fibers. It is made from stone, metal, fiberglass and chemical compounds. There are grills, lighting, hot tubs, refrigerators, roofs, gazebos, awnings, heaters and fire pits that often are part of deck construction. Guards have gone from simple, wooden geometry assembled by carpenters to various combinations of wood, metal, glass, composites and cable. There are tested assemblies with installation instructions and others built from a medley of materials. The message here is that "safety" is hard to define with so many variables and an ever-changing industry.

This collection of proprietary products drives a deeper analysis if one is to gauge deck safety. With various materials, blends and geometry, you have to expect varying performance. Deck board span, end joint bearing and gapping are hardly consistent. Guards constructed with inboard, surface or outboard post mounting locations require different attention to resist the required loading; they can't be built as one-size-fits-all. For today's consumers, one design doesn't fit all, either. Employing tried and true methods of yesterday with technologies of tomorrow likely won't lead to safe decks.

As provided for in IRC Section R104.11, the decking industry is heavily "alternative." Thus, "evidence" must be provided along with each proprietary and unique product and method. This evidence is often in the form of test reports or engineered design. The International Code Council Evaluation Service (ICC-ES) is a third party that provides this evidence to manufacturers and, ultimately, the end-user. For example, under AC174, ICC-ES evaluates the performance of composite decking and guard systems for compliance with the IRC-referenced standard ASTM D7032. I would be surprised to find any new deck built today that didn't have some "alternative" product installed that requires evidence or installation instructions on-site. Without them, you can't completely gauge deck safety.

Codes

As mentioned previously, the 2009 IRC included some serious new provisions aimed specifically at safe deck construction. Those provisions were expanded in the 2012 IRC. Deck ledger connections, where nearly all decks are supported on one side by the homes they serve, have a serious job to do. Ledger connection and lateral load restraint are the subject of most of the new code provisions. In my years of building decks and into my years of inspecting them, the notorious practice of installing the ledger over the siding, stucco or brick, pounding some lags in and following up with an impact wrench was the standard. That old standard now is replaced with specific language in the IRC.

However, as described earlier, decks aren't just decks

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Inspection and maintenance are important preventative measures to ensure deck safety.

anymore. They are outdoor living environments, ones from which consumers demand unique designs and construction methods. This makes it difficult to employ the new code provisions for many deck structures. It also appears to make many methods that seemed to have worked just fine before, non-compliant today. With prescriptive structural provisions, lines must be drawn. Some common practices have fallen outside those lines. Though standards have been introduced, the industry of decks is still primarily an alternative. The new standards are certainly forward progress for the industry, yet with anything new, they are taking some time for builders and code administrators to learn and employ, while still providing for the creative and architectural demands of our nation's homeowners. This YouTube video explains some of the complications with using the new standards.

Beyond the structure of decks, there are many other provisions of the IRC to be considered, such as emergency escape and rescue openings installed under decks or clearances at exterior vents, glazing and electrical equipment. There are many more of these provisions, but they typically have not been within reach of our nation's deck contractors. It would have been unusual to find one working from the IRC. The breadth of information, spanning all residential construction, was just too much to feasibly reference, but not anymore. With the release of the 2009 IRC, the ICC also published a unique book aimed specifically at the decking industry. *Deck Construction Based on the 2009 International Residential Code* extracts only the code provisions that affect the decking industry and includes them, with commentary, graphics and photos, in a full-color reference book. Beyond just explaining the IRC provisions, the book provides them exactly as written in the IRC.

Maintenance

Maintenance is commonly neglected in many construction aspects, as replacements often are more desired. That's fine when it comes to carpet or dishwashers, but they aren't supporting your guests at your summer barbecue. A structure isn't something we're used to maintaining. We don't think about the studs in our walls until we're hanging a picture, or the floor joists in our homes until they squeak under our feet. This is evident in the common practice of re-staining decks (replacing the carpet), but often without thinking about what's below. This YouTube video (in which, thankfully,

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no one was hurt, has a brief mention of language that some may find offensive) is classic in the comment at the end about having it resealed every year — a deck that appears to have been rotting away.

A residential backyard deck should be compared to your car more than any other construction feature on your property. It is exposed to moisture and temperature fluctuations. It may not have moving parts, but it does require maintenance for a long and safe service life. Just as an unexpected breakdown can be mitigated with proper maintenance and inspection of your car, so can an unexpected deck collapse be avoided. You wash your car; you hose off your deck. You wax your car; you re-stain your deck. You change the oil in your car … uh ... here's the problem: You should be inspecting your deck and repairing as needed. The Check Your Deck® campaign from NADRA aims for that goal and provides consumer and professional deck inspection checklists for download on its website.

Education

I have only scratched the surface of what there is to learn and understand about proper deck construction and the goal of deck safety. With an ever-changing industry, education is vital to the successful application of products and standards. ICC's book for decks is just the start. The North American Deck and Railing Association has launched an education and certification program to help bring our country up to speed regarding proper deck construction. This program includes four, four-hour courses, each followed by a 50-question exam. The education is available for everyone, but completing all four exams to become a NADRA Certified Deck Builder is available only to current members. Visit Nadra's website for more information.

Professional Deck Builder is a trade journal for the decking industry, and has been providing technical deck/code-related articles to the industry since 2007. Nearly 30 articles can be viewed online.

The American Wood Council (AWC) has published a guide for deck construction under the 2009 IRC. While not directly from the IRC, the membership of AWC has developed alternative solutions that meet the performance requirements of the IRC and can be submitted for approval. Download the document, "Design for Code Acceptance #6."

Decks have been "moving on up," and not just to a condo in the sky; they are still in our neighbors' backyards. As the future of deck construction and our expectation of deck safety become standardized, it needs to be done in a way that those neighbors still can achieve their outdoor living dreams. Deck safety can be increased in our country by just giving them a little more credit for the job they do. Annual inspections of the guts of existing decks need to be performed, and builders and code administrators need to be educated annually so they can understand the unique applications and design of decks. Overall, decks — both new and old — need a little more love and attention than they received in the past. **bsj**

Editor's Note: May was NADRA Deck Safety Month. To read more from NADRA about deck safety, click here.

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As always, your articles, ideas and submissions are welcome. Send them to foliver@iccsafe.org along with a daytime phone number at which to contact you with questions.