Building Codes And The Right Roofing

Adherence to building codes creates, enhances, and protects the value of a structure.

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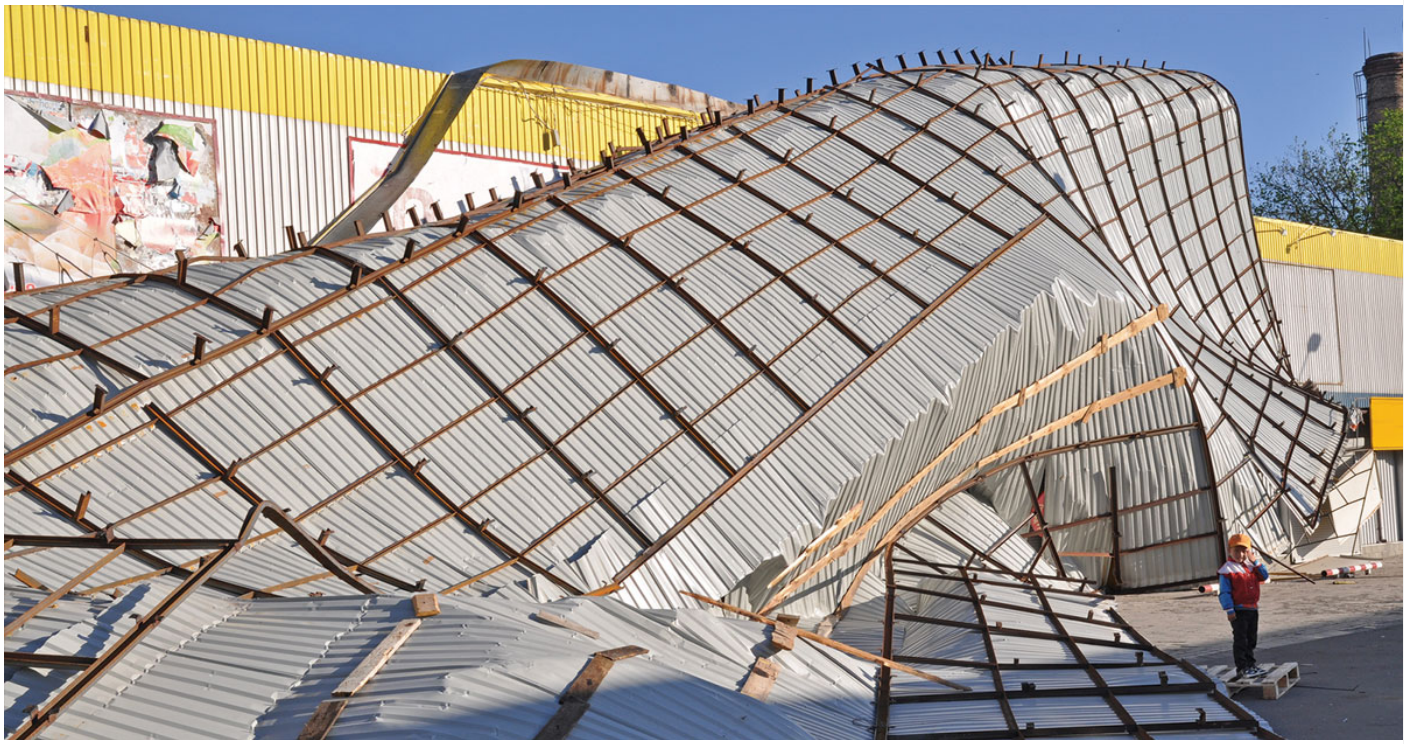
Few, if any, of us were sorry to see the end of 2021. It brought disrupted supply lines, a tight labor market, and a pandemic that roared back at the end of the year with apparent renewed force. Facility managers nationwide also had to contend with destructive, erratic weather and even the threat posed by an increasing number of "billion dollar natural disasters." There had been 18 of these events by December 1, and when the final tally is made, the devastating winter tornado outbreak in the Midwest as well as wildfires in the Denver suburbs will no doubt be added to the count. Put another way, the U. S. now experiences a billion dollar disaster every 22 days. This frequency of natural disasters demands attention: since 1980, the number of these destructive events has increased annually. While there may be debate about the cause of increasingly severe weather, the trend is indisputable.



(Photo: Adobe Stock / Evgeny Govorov)

This increase in destructive natural forces has intensified the ongoing re-examination and updating of building codes: should

they be more stringent, should enforcement be more rigorous, and what will codes look like in the future? While some of these important questions have yet to be answered, there are essential basics that facility managers need to be aware of as building codes evolve.

In the International Building Code (the most commonly adopted building code in the U.S.), the intent of the code is: "...to establish the minimum requirements to provide a reasonable level of safety, public health and general welfare through structural strength, means of egress facilities, stability, sanitation, adequate light and ventilation, energy conservation and safety to life and property from fire, explosion and other hazards, and to provide a reasonable level of safety to fire fighters and emergency responders during emergency operations." Note that the operative words here are "minimum" and "reasonable." In other words, building codes have never been designed to protect a structure from extreme, unusual weather. But they have become more stringent over the years, and that trend will most likely continue.

It's important to realize that adherence to building codes creates, enhances, and protects the value of a structure. If an owner ends up with a structure that does not meet at least the minimum requirements of the code, that owner is not getting an adequate return on investment.

There may be individuals who think government requirements like codes are an overreach and disregard requirements they don't agree with. This approach can be risky. For instance, if a problem develops with a roofing system after installation, facility managers who approved a less than code-compliant system may be viewed in a poor light. In legal or insurance dispute situations, confirmation of code compliance is also commonly reviewed and taken into consideration. Weak building codes or lax enforcement create a burden on communities through property damage, higher insurance premiums, insurance deductibles, loss of use, and missed economic opportunities.

On the other hand, a landmark study conducted in 2020 by FEMA found that up-to-date building codes lead to major reduction in property losses from natural disasters. The FEMA report calculated losses from earthquakes, flooding, and hurricane winds for each state and Washington, D.C. and found that over a 20-year period, cities and counties with modern building codes avoided at least $132 billion in losses from natural disasters. FEMA research has also found that structures built to higher standards are 77% less likely to be damaged than those that fail to meet code.

So, who creates building codes, and revises them in an effort to reflect state-of-the-art construction standards, especially when faced with increasingly severe weather? Model building codes are updated every three years based on innovation in building design, new products, improved methods, and technologies. Likewise, the updating process reflects research insights and lessons learned after disasters. The International Code Council, or ICC, a U.S.-based membership association made up of state and local code officials from around the country, conducts the ongoing revisions of model codes, soliciting input from all affected industries. Eleven ICC committees meet over a two-year period to review this input, and make recommendations for consideration by the ICC membership. A final vote takes place at ICC's annual conference to approve or reject the proposed

changes to the model code.

Once published, these model codes are widely adapted by state and local jurisdictions and are incorporated into their codes. The 2021 version of the I-Code is the most current, but the process for updating codes can take months, even years. Many municipal and state codes are still based on the 2018 or earlier versions.

The savvy facility executive will realize that interpretation of building codes, and compliance with them, is best left to the experts. Roofing contractors and consultants, for instance, should be aware of and conversant with building codes in the relevant jurisdiction. If a contractor is not supportive of codes and very familiar with the details of local codes, this should be a red flag to facility managers and building owners.

Keep An Eye On Roofing Codes

As an architect, with more than 25 years' experience in the commercial roofing industry, I've seen what can happen when a builder takes a shortcut with codes. I've also seen the resilience that is created when codes are adhered to. I stay familiar with the recommendations of the ICC as proposed code changes move through their process, and stay current with changes as they are approved. Of special interest to me are the code requirements that are related to commercial low-slope roof replacements.

Regardless of your area of expertise or your facility's geographic location, the changes outlined below reflect the level of granularity that needs to be observed to ensure code compliance. In general, these changes reflect the increasing threats from cataclysmic weather events, and are designed to strengthen a building that may have to withstand the impact. These include:

As extreme weather events are increasingly common, building codes related to roofing and other elements of the building envelope evolve to keep pace. (Photo: Adobe Stock / Phillip)

- Clarifications and increased stringency for how low slope roofs are attached at the edges where failures are most likely. For instance, the 2021 ICC code strengthens wind pressure resistance of a roof to ensure that roof system components are securely attached. This is to ensure that the roof system as a whole stays securely in place during wind events.
- There are also special requirements for components of roofing systems, such as rooftop ballast, including updated rules for the use of aggregate surfacing on roofs. This includes mandating the use of parapets in some cases.
- New requirements for construction drawings may include wind uplift resistance pressure zones as determined by the method noted in the code.
- Changes in climate zones could result in insulation levels and other energy conservation rules being changed in a particular county, updating earlier editions of the code.

In addition to these expanded requirements, the roofing chapter of the code typically has requirements for fire resistance from the outside-in. This could prevent the spread of a fire when an ember from the fire lands on an adjacent roof. Drainage is also addressed, specifying how rainwater flows off the roof. Codes also detail when it is permissible to add another layer of roofing as opposed to removing and replacing the entire roof system. And, given the increasingly aggressive Federal requirements for energy use, codes address how much insulation should be included and how the roof should be sealed to prevent air movement of these materials.

Given recent trends, there is little doubt that extreme weather events will continue to threaten the built environment. Current building codes, as updated and expanded, provide science-based protection from predictable weather events. These are an important tool for the construction community, and an important step for communities across the country to create shelter from the storm. Beyond the basics, however, a building owner or facility manager may want to invest in structural elements that exceed the protection provided in codes and, not incidentally, lower insurance rates. Given the almost inevitable increase in devastating weather events, the building code conversation between architect and owner is critically important, and can provide a gateway to talk about additional efforts to protect a building and its occupants.

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