



Masonry & Ceramic Tile Institute of Oregon

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Resiliency or Sustainability or Both

By
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We look at the pictures of the devastation that took place in 2018 and we see very few buildings that resisted the hurricane force winds and the wildfires in California practically destroyed everything in their path. The East Coast of the United States was ravaged by two Atlantic Hurricanes. Hurricane Michael caused an estimated \$25 billion dollars in property damage and Florence was responsible for close to \$24 billion dollars of property loss. Meanwhile, on the West Coast wildfires were creating havoc. The Camp Fire burned more than 153,000 acres in Northern California, near the town of Chico. The fire caused at least 88 fatalities and destroyed more than 18,000 structures, with the town of Paradise being the hardest hit¹. What can we do to protect our property from these disasters?

One way, is to construct buildings that exceed the basic building codes. In Mexico City Beach, Florida, we saw reports from CNN of a house that withstood the damaging winds. The owners said, "They built the house using materials and construction methods that exceeded the building codes". A homeowner, Jeremy Wolf, built his house in the Ojai Valley in California using concrete masonry with the idea that his home could withstand damage from a wildfire. Exceeding the building code, the concrete masonry and other fire resistant materials used to construct the house withstood the test when the "Thomas Fire" came onto his property.

The US Resiliency Council is an organization that looks at the resilience of buildings. Their definition of resilience is, "A measure of how quickly a system recovers from shock". The US Resiliency Council has created a rating system for resilience that helps owners, builders and designers determine how well their project will perform after a disaster. The building's performance is reviewed in three dimensions, Safety, Damage and Recovery. The USRC SAFETY dimension reflects the expected performance of the building in terms of loss of life, injury and egress. The USRC DAMAGE dimension is an estimate of the cost to repair the building, as a percentage of replacement cost (not including the replacement of contents). The USRC RECOVERY dimension is an estimate of the time until a property owner or tenant is able to enter and use the building for its basic intended functions. More about the benefits of the rating system can be found at www.usrc.org².

One of the more prevalent construction concerns is to create buildings that have a low impact on the environment. The US Green Building Council developed a rating system (Leadership in Energy and Environmental Design, LEED) that helped define green buildings. The US Green Building Council states, "LEED provides a framework to create healthy, highly efficient and cost-saving green buildings. LEED certification is a globally recognized symbol of sustainability achievement."

The difficulty is that sustainable buildings are developed to have a negligible impact on the environment- but can these sustainable buildings resist the impacts of the environment?

The level of damage and loss of use for LEED®-rated buildings in Hurricane Sandy was significant. The resulting debris and the quantity of resources required to rebuild underscored the need to consider the impact of a building's natural hazard performance and resilience³. According to the Small Business Institute, "25% of small businesses do not reopen after a major disaster. For a building to be truly sustainable, the environment must have little to no impact on it and its occupants' activities before and after a disaster. A sustainable building must be resilient as well."⁴

The use of masonry is one way to meet the needs for resiliency and sustainability. Masonry buildings are energy efficient, especially when considering the benefits of a mass wall. Masonry does not contain volatile organic compounds and is a superior sound deadening material. Recent research suggests that concrete masonry reabsorbs carbon through a process known as "carbonation"⁵. This helps reduce the total carbon foot print of concrete making these products more eco-friendly. Masonry is not damaged by water nor does it decay due to moisture making it a great material to resist flood waters. Concrete masonry is often used to construct tornado shelters. These wind resistant walls are not destroyed by wind borne debris. Masonry is not combustible, it is more than fire-resistant, it does not burn.

Conditions have changed. Our environment is more unpredictable now more than ever. We need to take charge and demand that our buildings can withstand the reoccurring weather related disasters, as well as meet the demands of sustainability. Masonry can meet both of these demands!

Resources

1. "Assessing US Climate in 2018" National Centers for Environmental Information (NCEI) 2019-02-06
2. "US Resiliency Council" USRC Dimensions and Definitions (<http://usrc.org/rating-definitions>)
3. "US Resiliency Council" USRC_Architects_Brochure.pdf
4. <https://www.bisnow.com/los-angeles/news/commercial-real-estate/buildings-cannot-achieve-sustainability-without-disaster-resistant-infrastructure-construction-experts>
5. "Pacific Northwest Building Resiliency Coalition" Concrete-as-a-Carbon-Sink-Rethinking-Carbon-Sequestration-in-the-Built-Environment.pdf

The Masonry and Ceramic Tile Institute of Oregon assumes no responsibility for the accuracy or completeness of this document.