

“Members should incorporate adaptation strategies with their clients to anticipate extreme weather events and minimize adverse effects on the environment, economy and public health”
AIA Code of Ethics

CONSTRUCTION & MATERIALS RESILIENCY IT'S TIME TO TAKE ACTION

ARE YOU SPECIFYING RESILIENT MATERIALS?

Every Floridian will likely face a natural disaster in their lifetime, and the risk is growing. According to the National Institute of Building Sciences, “the U.S. disaster losses from wind, floods, earthquakes, and fires now average \$100 billion per year ...”¹ Fortunately, there are numerous strategies that, when coupled with good design, can successfully help mitigate damages and significantly reduce severe weather impacts to structures. While building to the minimum code requirement provides a significant level of safety, the stringency of codes adopted at the state and local level can vary widely. It is important that designers consider and evaluate risk factors and understand resilient design strategies available to reduce these impacts.

FLOOD RESILIENT MATERIAL FACTS

Buildings susceptible to floods or those in coastal areas that experience relatively short-duration flooding or storm surge (generally less than 24 hours) must be constructed with flood damage-resistant materials below the base flood elevation. Per the National Flood Insurance Program (NFIP), only Class 4 and Class 5 materials are acceptable for areas below the base flood elevation in buildings in special flood hazard areas.²

Flood [damage]-resistant material is defined by the NFIP as “any building product [material, component or system] capable of withstanding direct and prolonged contact with floodwaters without sustaining significant damage.”² They include such materials as concrete, stone, masonry block, ceramic and clay tile, pressure-treated and naturally decay-resistant lumber, epoxy-based paints and metal. In addition to resisting damage from floodwaters and their contaminants, these materials are relatively easy to clean after floodwaters recede.² Flood vents are also essential to reducing structural damage from flooding.

Unacceptable materials for below-BFE applications include Class 1, 2 and 3 materials for the following reasons: Normal adhesives specified for above-grade use are water soluble or are not resistant to alkali or acid in water, including groundwater seepage and vapor. The materials contain wood or paper products, or other materials that dissolve or deteriorate, lose structural integrity, or are adversely affected by water. Sheet-type floor coverings (linoleum, rubber tile) or wall coverings (wallpaper) restrict drying of the materials they cover. These materials are dimensionally unstable and absorb or retain excessive water after submergence.²

HURRICANE RESILIENT MATERIAL FACTS

Buildings susceptible to hurricanes and those specifically in high velocity wind zones will be designed to code minimum, but building to the incrementally efficient maximum can further help reduce future losses. Hurricane resilient strategies begin at the roof with stronger edges inclusive of wider drip edges and fully adhered starter strip, design for a sealed roof deck so that when the roof covering fails, the sheathing is watertight. Specify ring-shank nails which have threads that grip the roof decking, require additional bracing at gable ends and properly detail for secured anchored trusses and chimneys.³ Opening protectives are also critical to envelope protection from wind pressure and debris with impact rated products offering the best protection. Miami-Dade County maintains a database of approved products that are allowed to be used in the Florida high velocity wind zones.

FIRE RESILIENT MATERIAL FACTS

According to a 2008 study from the Southern Group of State Foresters, 95.5% of Florida wildland-urban interface communities are at high or extreme risk of wildfire damage based on the likelihood of wildfire occurring in nearby areas. Where code requirements are absent, designers, architects, developers, builders and homeowners should take the initiative for wildfire protection improvements by following guidelines offered by the National Fire Protection Association or other wildfire risk reduction programs. Architects are encouraged to specify fire resistant exterior wall cladding, roof covering or subroof, soffit and vent materials; employ exterior cladding other than wood or vinyl; and avoid asphalt shingles or wood shake roof coverings.

RESOURCES FOR ACTION

FEMA - Flood Damage-Resistant Materials Requirements,

Technical Bulletin 2: www.fema.gov/sites/default/files/2020-07/fema_tb_2_flood_damage-resistant_materials_requirements.pdf

National Institute of Standards and Technology - Role of Materials Selection in the Resilience of the Built Environment:

www.ncbi.nlm.nih.gov/pmc/articles/PMC6506836/

Federal Alliance for Safe Homes – Resilient Design Guide: flash.org/resilientdesignguide.pdf

National Institute of Building Sciences: www.nibs.org/projects/natural-hazard-mitigation-saves-2019-report

Florida Department of Agriculture and Consumer Services, Division of Forestry: www.fl-ficc.com/wp-content/uploads/2017/10/Wildfire_Risk_Reduction_in_FL.pdf

Sources:

1. National Institute of Building Sciences: <https://www.nibs.org/projects/natural-hazard-mitigation-saves-2019-report>

2. FEMA'S Flood Damage-Resistant Materials Requirements for Buildings Located in Special Flood Hazard Areas in accordance with the National Flood Insurance Program, Technical Bulletin 2 / August 2008

3. Insurance Institute for Business & Home Safety: <https://ibhs.org/guidance/fortified-construction-standards/>