

Incorrect Specifications of Windstorm Certified Building Components an Ongoing Problem in Florida

The specifier in Minnesota can be forgiven for not fully comprehending the intricacies of Hurricane codes in Florida. After all, it's been a long time since a hurricane threatened the twin cities—or Denver, or Chicago or St. Louis. But even though architects/specifiers throughout most of the country are far removed from the dangers of hurricanes, many of the projects they work on might be located in high-risk areas, Florida in particular. For this reason, specification professionals that play a part in Florida building projects need to fully comprehend that state's rigorous hurricane codes and identify doorway components that are windstorm certified. Otherwise, people and property may be placed at risk to destructive hurricane forces.

The four powerful storms that struck Florida during the 2004 hurricane season served as a reminder of why the codes were developed and reinforced the role architects/specifiers play in producing structures that protect occupants. Specifying doorway components that have not been granted windstorm certification could endanger lives. Including even a single uncertified doorway in a building could conceivably put an entire structure at risk.

A Real and Persistent Problem

Building inspectors are unforgiving—and rightfully so—when encountering doorways that fail to meet code requirements. Opening components that theoretically meet windstorm criteria but do not have a Florida Building Commission stamp of approval are not tolerated and will be ordered replaced. It's a real problem encountered by door and hardware distributors on a regular basis.

“It happens a lot and creates a number of construction headaches,” said Denison Crocker, vice president of Brabner & Hollon, Inc. a Mobile, Alabama-based door and hardware distributor that supplies doorway products for construction projects throughout the Gulf coast.

Crocker noted that after a building inspector orders the products to be replaced, the general contractor will come back to him and complain. But, as Crocker points out, distributors can't be held liable for simply fulfilling the written specifications.

“In order to comply with code, building blueprints must include the design pressure of every single exterior door. This is no easy task and requires a great deal of time. The problem is,” Crocker explained, “architects are often not given enough time to properly calculate the wind loads for every door. The architects can be under tremendous pressure to complete blueprints so the owners can work to obtain financing for the project. But the wind load calculations shouldn't be rushed; there are so many different variables to consider and a whole slew of parameters that must be met.”

Since code requirements vary according to geographic regions, mastering the intricacies of Florida's windstorm codes requires careful attention to a number of details. This alone takes precious time away from the building design phase and could lead to hasty and improper wind load calculations. To understand the codes, it's best to start from the beginning and learn the history that led to their development.

Code Development

People and property are the main reasons the Florida codes were developed. The first rendition of the construction protocols took shape after Hurricane Andrew devastated the state in 1992 causing \$28 billion in damage and claiming 48 lives. Damage was caused not only by the physical force of the 150 mph winds, but also by the intense storm pressures and flying debris; items such as roof tiles, wood and trash cans were swept up by the winds and became high velocity missiles that battered nearby structures.

In the aftermath of the destruction, insurance companies threatened to drop coverage of hurricane-prone areas unless more stringent building codes were developed to prevent similar disasters. Building and construction experts sifted through the rubble to determine why some structures were obliterated by the high winds, while others remained intact. This follow-up investigation provided the basis for a new set of windstorm codes and testing standards that went into effect throughout the Gulf region.

In 1996 the state formed a commission to standardize and improve the existing codes. The result was a single, statewide code that includes the ASCE7-98 standards for severe wind classifications and a system for approving products that meet requirements for each classification.

Maintaining Integrity

The codes demonstrate that maintaining complete structural integrity during a hurricane is critical not only to the survival of a building, but also the occupants inside. If a single structural component of the building envelope is compromised, destructive hurricane winds can enter, creating an internal pressure change that can literally blow the roof off a structure. Doors are one of the critical components that must remain intact for a building to survive. The codes now in place set minimum standards that must be met to ensure doors and hardware can withstand destructive hurricane force winds and debris impacts.

Every opening in the exterior envelope of all buildings constructed in Florida must be scrutinized to determine the wind pressure, impact and air/water penetration requirements. The architect/engineer is required by code to have the design pressures on the plans at time of permit. The equation includes building height, terrain, opening location in the building, importance factor and many other requirements the distributor or contractor may not know. These variables could change the minimum requirements by a factor of four. *Shuttering the opening does not remove the pressure requirements, just impact standards.*

Peeling Away the Onion

Explaining the various layers of building codes in Florida is no easy task. Door and hardware products can be windstorm certified by three separate standards: American National Standards Institute (ANSI) A250.13 2003, American Society of Testing Materials (ASTM), and the Florida Building Commission which further defines its standards by geography, with Dade County and Broward County listed as High Velocity Hurricane Zones (HVHZ) and subjected to the most stringent standards. The state is divided into Windstorm Debris Regions that are delineated by wind speeds (see map).

All exterior envelope components used on structures in wind zones above 120 mph must meet certification standards that require the product to withstand impact from a 9 lb. 2” by 4” piece of lumber fired from an air cannon at 35 mph. This requirement can be omitted by using an approved shutter. Assemblies used in the HVHZ are subjected to impact testing (PA/TAS 201) to 1.5 times design pressure, water penetration, air infiltration, and intrusion resistance (PA/TAS 202), and cycle testing (PA/TAS 203). Until recently the entire opening assembly was tested as a single component. For example if an opening was tested and the lock failed, the entire assembly—the door, frame, hinge and accessory hardware—also failed. No substitution was allowed.

The new ANSI standard (ANSI A250.13) allows individual component testing. Thus, an architect/specifier can assemble an opening by choosing certified components. The component certification testing is conducted under the auspices of UL (www.UL.com) and ITS (www.intertek-etlsemko.com). Listings of approved products can be found on their respective websites. Since this method is new, however, the selection of products now available is still sparse.

Architects/specifiers must demand proof from manufacturers that any product used in the building envelope meets Florida’s rigorous testing standards. A listing of approved products can be found on various government agency websites. Products certified by the Florida Building Commission (www.floridabuilding.org) can be used anywhere in the state. Caution should be used when designing openings for the HVHZ which has higher requirements than the rest of the state.

NOA Know-How

Most building departments across the state will accept products with a Dade County Notice of Approval (NOA). NOA listings can also be found online at www.buildingcodeonline.com. The state also recognizes certifications issued by UL, ITS, Metro Dade County and other third party agencies. An architect/engineer can approve products using testing data and rational or comparative analysis. This method is used mostly for products that have no recognized national tests or for new and innovative products. Authorities Having Jurisdiction (AHJ) can also approve products at the local level. This is done on a site specific basis and can be costly if the building department issues separate charges each time the service is utilized.

Plan Accordingly

The 2004 hurricane season saw four powerful storms strike Florida. Hurricane Charley demonstrated the unpredictable nature of hurricanes when it suddenly intensified just

before landfall on August 13, and struck an area outside the designated High Velocity Hurricane Zone. Interior sections of the state, thought to be less vulnerable, sustained extensive damage from three consecutive hurricanes. The lesson served by the 2004 hurricane season: expect the unexpected. For architects/specifiers designing projects in Florida, this means plan carefully and use components that are recognized by the state as windstorm certified.

