



WTG HURRICANE & TORNADO PROTECTION

The maximum wind speed in the 2009 International Building Code “IBC” (or Florida Building Code “FBC”), is 150 mph (excluding Guam). This wind speed ceiling results in glass products being tested and qualified in terms of their structural and debris resistance for wind speeds under 150 mph. This means the current building code and tested products protect up to a Cat 3 hurricane. On the other hand, ICC 500-08 describes test protocols for Cat 5 hurricanes and F4 tornadoes. A facility designed to protect against Cat 5 hurricanes or F4 tornadoes is called a Storm Shelter. Essential facilities that must remain operational during these windstorms should comply with the ICC500 Storm Shelter standards.

ICC 500-08 Curtain Wall

The following is believed the first curtain wall to pass all ICC 500-08 testing requirements at a laboratory with International Accreditation Service certification:

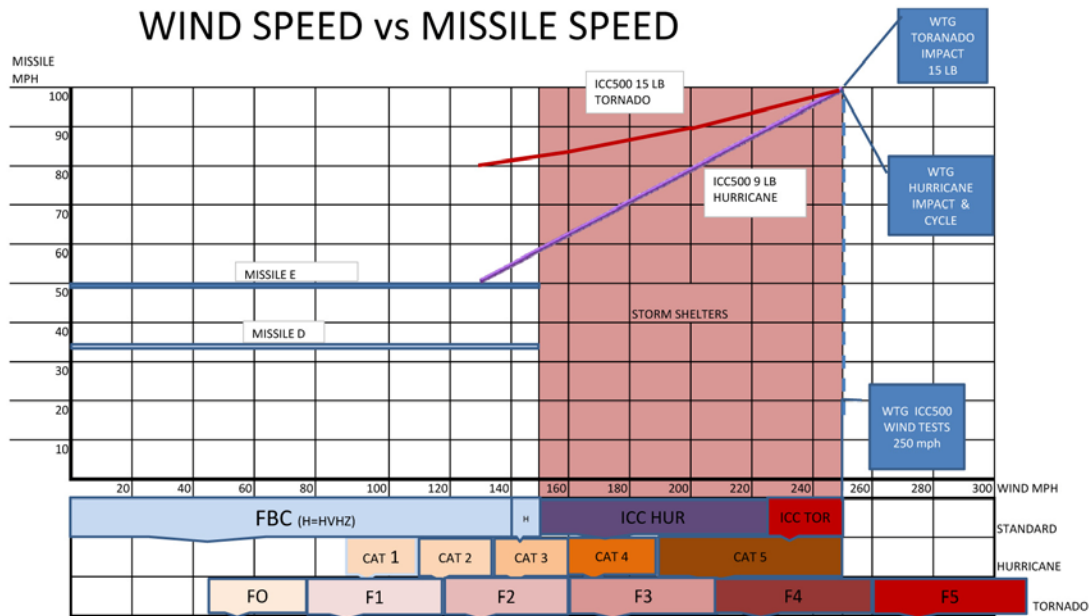
WTG System:	Unitized and preglazed	
Mullion dimension	6.35 x 18.42-cm	[2 ½” x 7 ¼”]
Tested frame size	152.40 x 365.76-cm	[60” x 144”]
Largest lite (daylight)	146.05 x 243.84-cm	[57 ½” x 96”]
Smallest lite (daylight)	146.05 x 102.87-cm	[36” x 36”]
Glazing	[monolithic – laminated] <u>and</u> [insulated – laminated]	

WTG Test Parameters:

Structural test:	1,074 kg / m ² (+/-)	[220 lb/sf ² (+/-)]
Structural test x 1.2	1,289 kg / m ² (+/-)	[264 lb/sf ² (+/-)]
Wind speed	250 mph	
Impact test at smallest lites:	Hurricane: 4.08-kg [9 lb] 2x4 @ 161 - km/h [100 mph] Tornado: 6.80-kg [15 lb] 2x4 @ 161-km/h [100 mph]	
Hurricane Speciman Cycling:	based on design pressure 220 lb/sf ² (+/-)	
Spall Protection per ICC 500		

The above curtain wall was also tested to an optional, water test prior to the structural tests, following ASTM E 331 procedures @ 44 psf = 20% x 220 psf. The above curtain wall was tested under ICC 500-08 as a single span but tested as a twin span under HVHZ /NOA. The curtain wall was also tested as a twin span with arena bomb testing (7 psi). The chart “WIND SPEED vs MISSILE SPEED” defines wind speed

and missile speed prescribed by the building “Standard” (FBC and ICC500) and compared to Hurricane wind speed and Tornado wind speed. The blue boxes on the right show WTG testing.



The picture below is a 15 lb 2x4 before impacting glass at 100 mph. The lower right picture shows the same glass, after the impact.

