

DECLARATORY STATEMENT REQUEST

DCA08-DEC-002
FILING AND ACKNOWLEDGEMENT
FILED, on this date, with the designated
Clerk, receipt of which is hereby
acknowledged.

Scott Hampton, PE

Paula P. Ford 1/7/08
Paula P. Ford Date
Commission Clerk

BACKGROUND:

My normal duties require me to develop installation instructions for Florida Product Approvals. Some of the products are storm shutters. When storm shutters are designed specifically for use in the Florida High Velocity Hurricane Zone (HVHZ) areas, the 2004 Florida Building Code (FBC) explicitly defines glazing offset requirements. But when storm shutters are designed for non-HVHZ areas, there is a little bit of ambiguity in the FBC as to what if any offset requirements exist. The FBC does reference ASTM E1996 standard, but it gives the choice of conforming to the 2002 or 2005b version. The 2002 version is itself a little ambiguous with respect to non-porous shutter offsets. The 2005b version adds more information, but not much. The 2006 version adds even more information, but this version is not referenced in the 2004 FBC (and does not appear to be referenced in the 2007 FBC either). Because of the lack of easily interpretable requirements for non-porous shutters in Wind Zones 1 thru 3 --- winds less than 140 mph --- non HVHZ areas), many people seem to believe non-HVHZ areas storm shutter offset requirements from the protected glazing do not exist.

If glazing separation requirements do not exist for storm shutters in non-HVHZ areas, then there is the real possibility that the protected glass can be broken by either missile impact on the shutter, or by shutter impact into the glass caused by cyclic wind pressures. It seems to be well documented that pressure equalization from the front of non-porous shutters to the glazing beneath can readily occur with only minor gaps around the perimeter of the shutter and the protected opening. Therefore, if the underlying glass breaks, internal pressures in the building will change. What does not seem to be as well documented is what rate of change of pressurization is great enough to cause structural over or under pressurization. That is, if the storm shutter protected glass breaks due to shutter impact with the glass, then how large of a gap can there be around the perimeter of the shutter before the structural classification changes from enclosed to partially enclosed (we will assume that the glass is otherwise rated for the wind pressure requirements of the structure and will only break if impacted)?

The ASTM E1996 standard (2002 and 2005b) is quite explicit as to shutter separation requirements for porous shutter systems. Section 8.3 indicates that minimum window offset requirements for porous shutters as the larger of --- Dynamic (impact) deflection + 25%; or (Cyclic deflection + residual deflection) +25%. The ambiguity of ASTM E1996 occurs (as stated above) for shutters classified as non-porous. For non-porous systems you might be able to claim adherence to the 2002 version of ASTM E1996 and get away with not using any window offset. But in Section 7.2 (Pass/Fail Criteria) of ASTM E1996 (2002 and 2005b version), it indicates that for Wind Zone 4 (winds over 140 mph - which includes the Keys - which is outside of the HVHZ) that "all test specimens shall resist the large or small missile impacts, or both, without penetration of the inner plane of the infill..." In-fill is defined as "glazing in a fenestration assembly or curtain wall". This appears to be applicable to the use of porous and non-porous shutter systems. Therefore, non-porous Florida Products designed for non-HVHZ would either have to list separate requirements for wind speeds greater than and less than 140 mph, or provide the worst case separation (Wind Zone 4) for all areas. Note also that most Florida Product approvals for shutters do not distinguish between Essential and Non-Essential facilities. As of the 2005b version of ASTM E1996, separation requirement exist for impact protective systems used on Essential facilities in all Wind Zones. The 2005b version of ASTM E1996 also made the porous shutter offset requirements (as stated above) applicable to non-

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porous shutters in Wind Zone 4 — Florida Keys (although this changed to something slightly different in the 2006 version).

With reference to this matter, please also note the Jan. 4, 2008, BOAF Florida Building Code Informal Interpretation #5503, included with this Declaratory Statement Request.

REQUEST:

Please provide an interpretation of the 2004 FBC related to the above material by answering the questions that follow.

QUESTIONS:

1. Is it the intent of Section 1609.1.4 (2004 FBC, Including supplements through 2007), in non-HVHZ areas, to require adequate separation of storm shutters (impact protective systems porous and/or non-porous) from the underlying glazing to prevent glass breakage due to missile impacts on the storm shutter, regardless of the separation requirements within the referenced ASTM E1996 standard?
2. Is it the intent of Section 1609.1.4 (2004 FBC, Including supplements through 2007), in non-HVHZ areas, to require adequate separation of storm shutters (impact protective systems porous and/or non-porous) from the underlying glazing to prevent glass breakage due to storm shutter impact on the glass caused by cyclic wind pressures, regardless of the separation requirements within the referenced ASTM E1996 standard?
3. Since it is very probable that the glass being protected by a storm shutter is non-impact rated, is it correct to assume that storm shutter contact with the glass (as determined by tested shutter deflection versus the prescribed shutter offset from the glass) should be considered synonymous with glass breakage (i.e., in order to prevent glass breakage, glass contact must be prevented)?
4. Is it the intent of Section 1609.1.4 (2004 FBC, Including supplements through 2007), in non-HVHZ areas, to allow glass breakage due to shutter contact with glass if the shutter seals the protected opening from wind pressure?
 - a. If the answer to question #4 is yes, then please describe the defining requirement(s) of "seals the protected opening", and indicate if this is equally applicable for both positive and negative wind pressure.
 - i. With reference to question #4a, if the opening covering requirements for storm shutters of HVHZ Section 2413.7 of the 2004 FBC (i.e., 1/4" side clearance and overlap of 1.5 times side clearance) are satisfied, does this constitute sealing the protected opening from wind pressure?
 - ii. With reference to question #4a, are there any special provisions for fabric storm shutters that allow them to be installed close enough to the protected glass that glass breakage can occur from missile impact with the fabric? The caveat being that under positive pressure the fabric presses against the broken

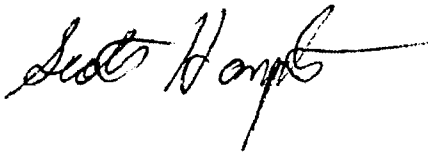
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glass to prevent internal over pressurization (note that under negative pressure the fabric shutter would pull away from the broken glass and potentially cause a depressurization depending on how the fabric is attached around the perimeter --- fabric attached only at opposite ends will have large separation on the un-attached side that can easily exceed the 10% opening limitation that defines the shutter as porous).

5. Do the answers to any of the preceding question change if reference is made to the 2004 Florida Residential Building Code (including supplements through 2007) (re: Sections R301.2.1.2 and R4410.4.7).

Sincerely,

A handwritten signature in black ink, appearing to read "Scott Hampton", with a long horizontal flourish extending to the right.

Scott Hampton, PE



Florida Building
Code
Informal
Interpretation



Date: Fri Jan 4 2008

Report #: 5503

Code: Building

Section: 1609.1.4

Question:

Is it the intent of Section 1609.1.4 (2004 FBC, Including supplements through 2007), in non-HVHZ areas, to require adequate separation of storm shutters (impact protective systems porous and/or non-porous) from the underlying glazing to prevent glass breakage due to missile impacts on the storm shutter, regardless of perceived ambiguities for separation within the referenced ASTM E1996 standard?

Answer:

Yes.

Commentary:

The intent of the impact protection is to prevent the glazing from being breached by impact, otherwise the impact protection would have to seal the opening against wind pressure. Shutters do not change pressure ratings on the opening, unless so stated in the notice of acceptance.

Notice:

The Building Officials Association of Florida, in cooperation with the Florida Building Commission, the Florida Department of Community Affairs, SBCCI, and industry and professional experts offer interpretations of the Florida Building Codes in the interest of consistency in their application statewide. They are informal, non-binding and subject to acceptance and approval by the local building official.