

# Hurricane Code and Requirements

Presented by James Bell  
ASSA ABLOY Windstorm Coordinator

*ASSA ABLOY is the global leader in door opening solutions, dedicated to satisfying end-user needs for security, safety and convenience*

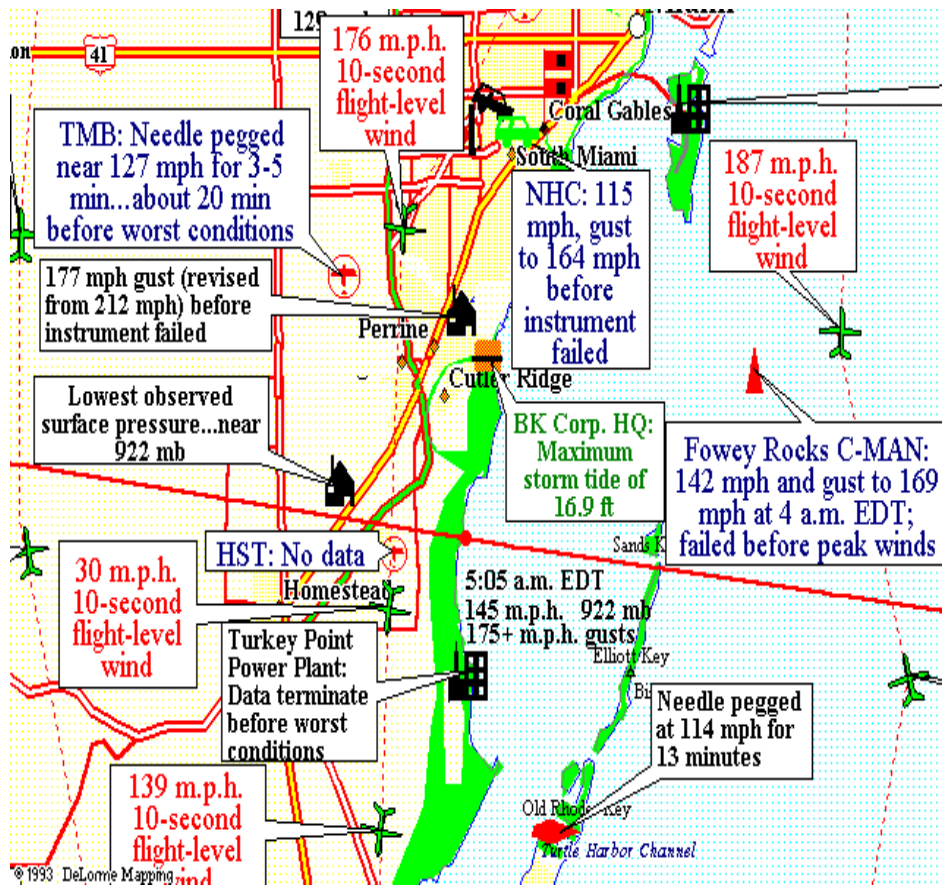


# Learning Objectives

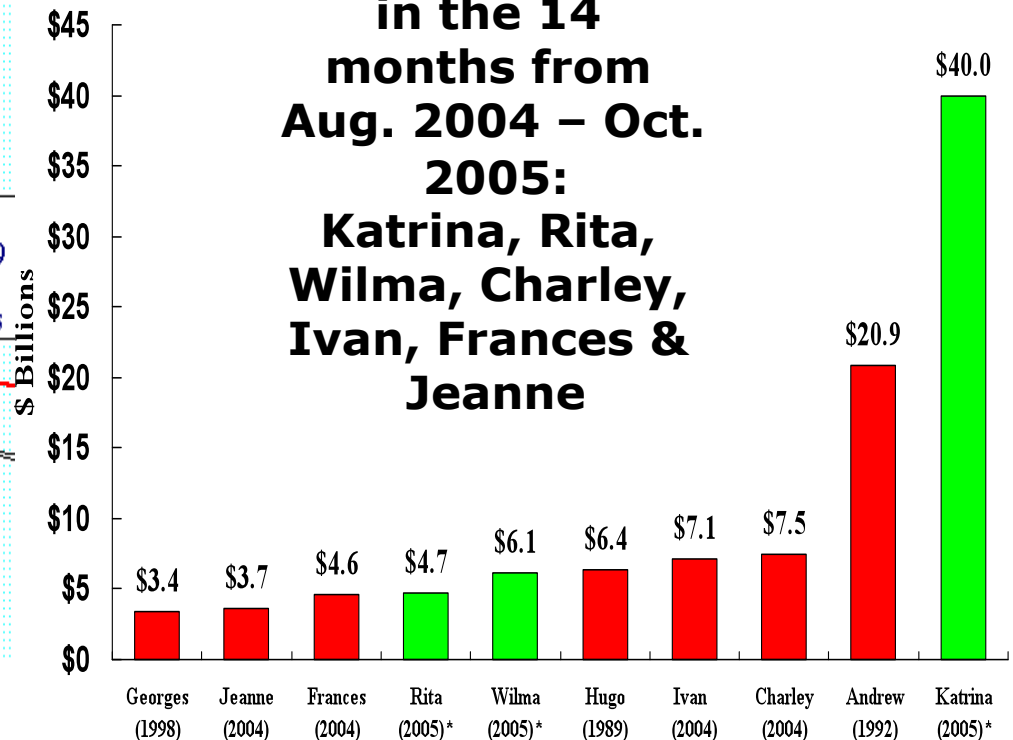
- **At the conclusion of this program, participants will be able to:**
  - **Understand why windstorm codes were developed**
  - **Choose the appropriate product approval system for their state's hurricane requirements**
  - **Know the difference between component testing and assembly testing**
  - **Make the proper choices in inspecting doors and hardware to meet these code requirements**
  - **Evaluate the benefits to using independent third party certified and labeled products**



# Why Do We Have Wind Codes?



**Seven of the 10 most of the expensive hurricanes in US history occurred in the 14 months from Aug. 2004 – Oct. 2005:**  
**Katrina, Rita, Wilma, Charley, Ivan, Frances & Jeanne**







# State Product Approval and the Florida Building Code

## Building Codes and Standards

Mo Madani, CBO, Technical Unit Manager

Suzanne Davis, Product Approval

Joe Bigelow, PowerPoint Design, Florida Building Code

Jon Caudill, Florida Building Code

Robert Lorenzo, Manufactured Buildings





# State Product Approval - Rule

## RULE 9N-3 F.A.C.

This **rule applies** to approval of products and systems which comprise the **building envelope** and **structural frame**, for compliance with the structural requirements of the Florida Building Code



## RULE 9N-3- Scope

- (1) Products in the following categories as defined by subcategories of subsection 9N-3.010(31), F.A.C., shall be available for approval by the Commission pursuant to Rule 9N-3.090, F.A.C., for use in the state:
  - (a) **Panel Walls;**
  - (b) **Exterior Doors;**
  - (c) **Roofing Products;**
  - (d) **Skylights;**
  - (e) **Windows;**
  - (f) **Shutters; and**
  - (g) **Structural Components.**
- (2) This rule applies to approval of products and systems, which comprise the **building envelope and structural frame**, for compliance with the structural requirements of the Florida Building Code



# Methods

## Four Methods for State Approval



- Certification Method (**Approving Authority DCA**)
- Evaluation Report from a Florida licensed Architect or a Florida Professional Engineer  
(**Approving Authority Commission**)
- ❖ Test Report (**Approving Authority Commission**)
- Evaluation Report from an Evaluation Entity  
(**Approving Authority Commission**)



## Local Product Approval - Scope

### 553.8425 Local product approval.--

(1) For local product approval, **products or systems of construction shall demonstrate compliance with the structural windload requirements of the Florida Building Code** through one of the following methods:



## Local Product Approval – compliance

1. A **certification mark, listing, or label** from a commission-approved certification agency indicating that the product complies with the Code.
2. A **test report** from a commission-approved testing lab indicating that the product tested complies with the Code.
3. A **product-evaluation report** from a commission-approved product evaluation entity indicating that the product complies with the Code.
4. A **product-evaluation report** from a Florida professional engineer or Florida registered architect indicating that the product complies with the Code.
5. A **statewide product approval** issued by the Florida Building Commission.



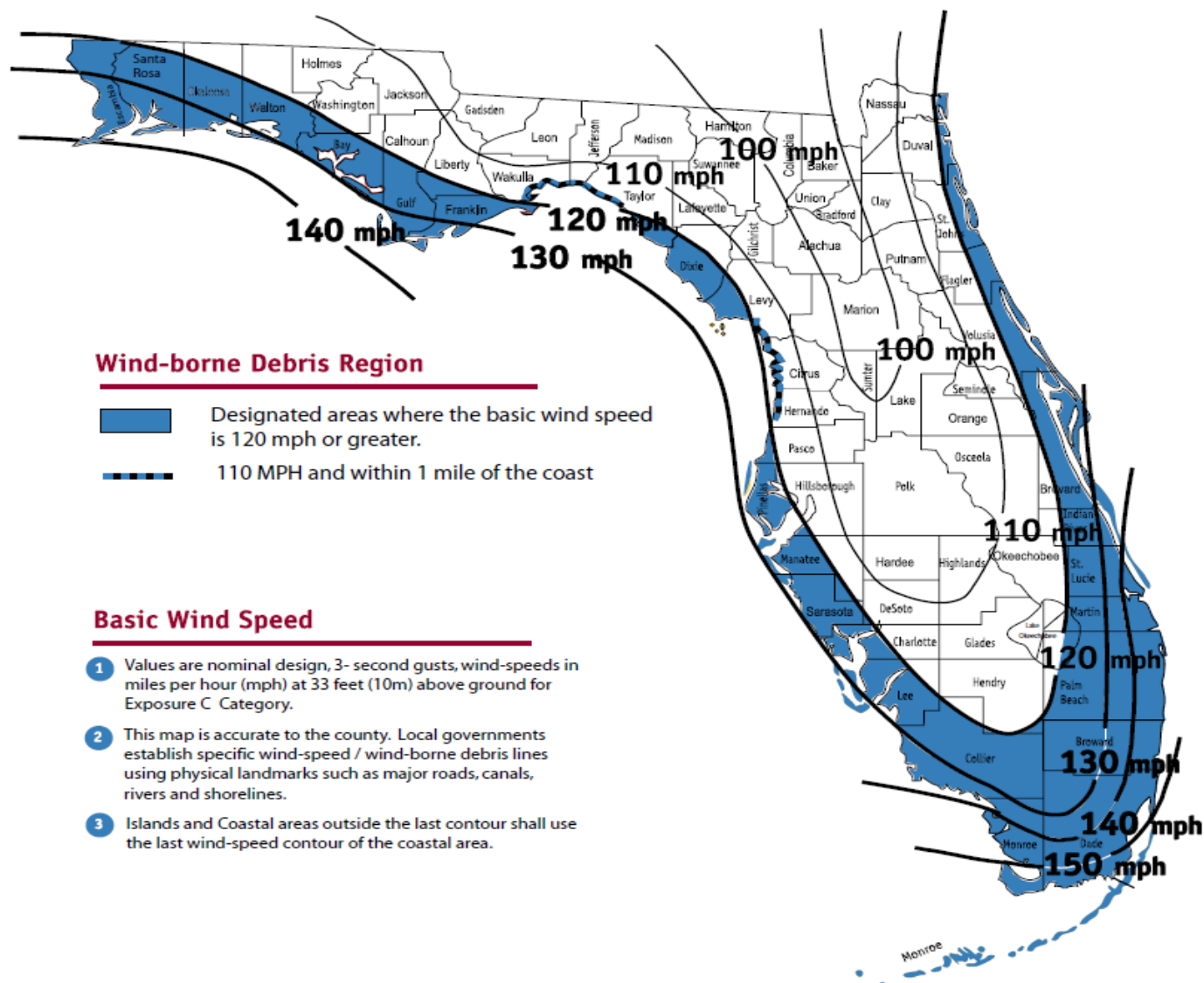


# Local Product Approval - modification

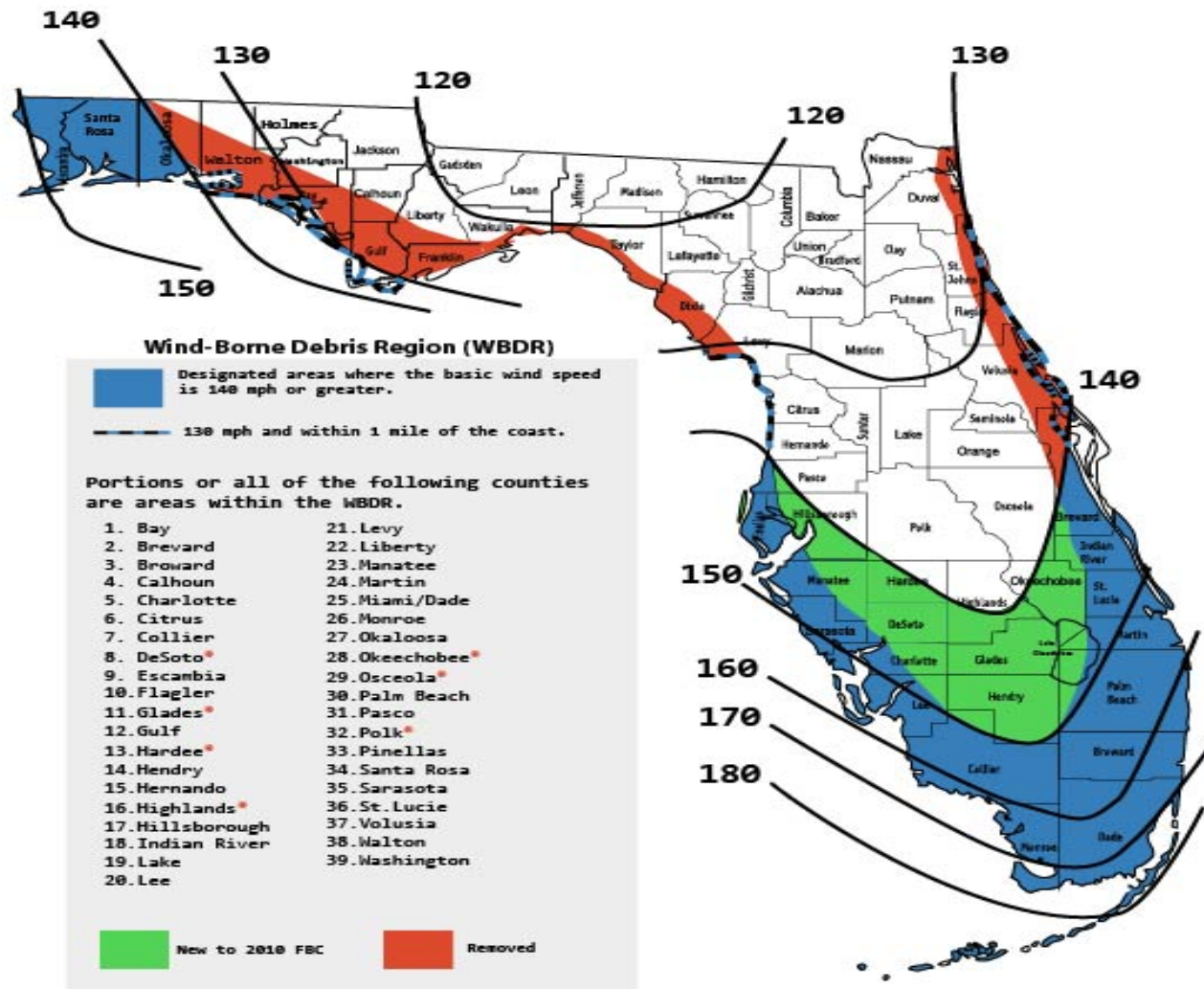
## 553.8425 Local product approval.--

**Local building officials** may accept modifications to products or their installations provided sufficient evidence is submitted to the local building official to demonstrate **compliance with the Code or the intent of the Code**, including such evidence as certifications from a Florida Registered Architect or Florida Professional Engineer.

# Wind-Borne Debris Region



2010 FBC  
**State of Florida**  
**Wind-Borne Debris Region**  
**Category II and III Building and Structures**  
**except health care facilities In Miles Per Hour**  
**Figure A**

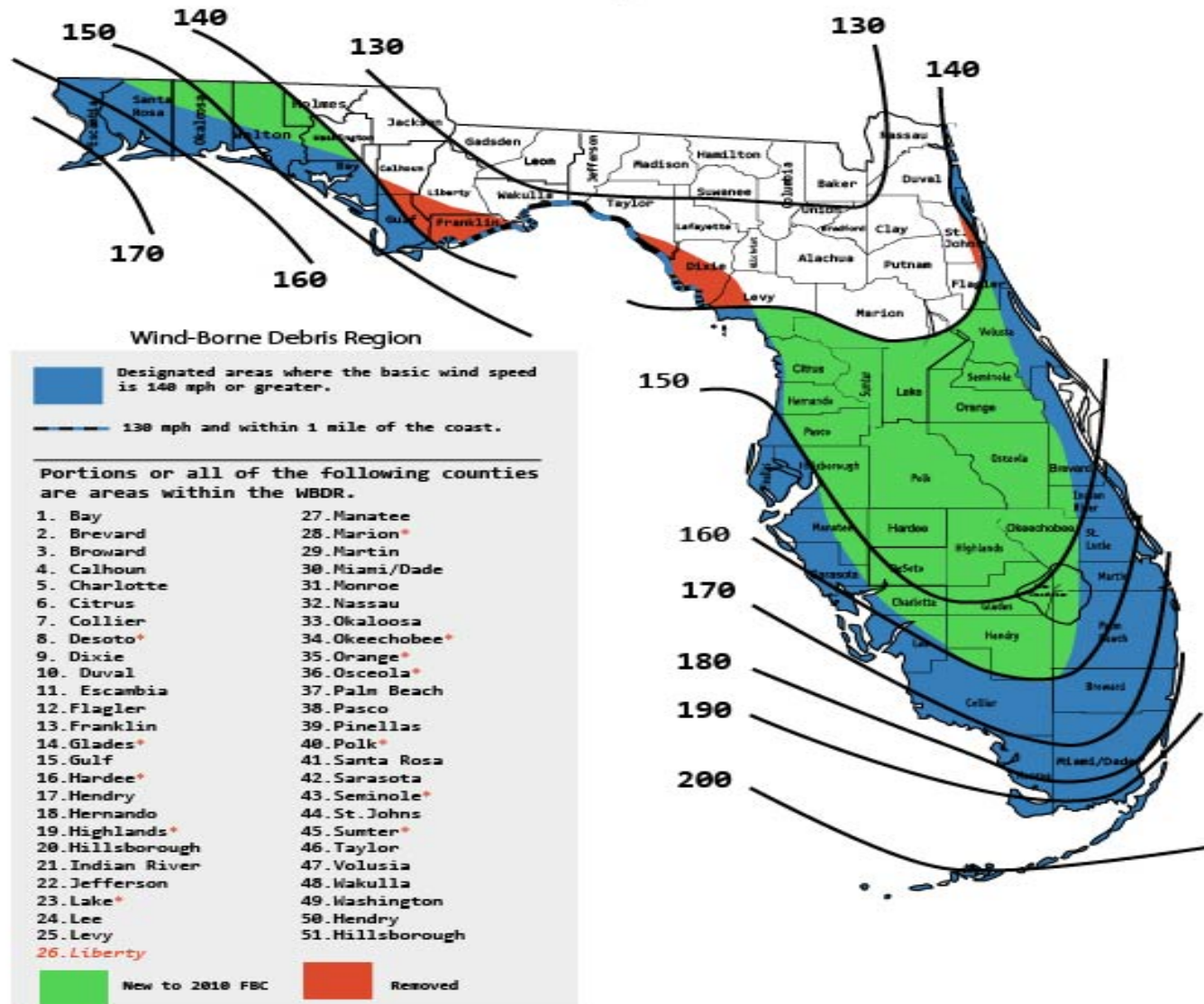




2010 FBC  
State of Florida  
Wind-Borne Debris Region

Category IV Building and Structures  
and Occupancy Category III health care facilities In Miles Per Hour

Figure B



**2010 Florida Building Code – Projected to go into effect 3/15/2012**

**OCCUPANCY**

**CATEGORY NATURE OF OCCUPANCY**

**Buildings and other structures that represent a low hazard to human life in the event of failure, including but not limited to:**

- **Agricultural facilities.**
- **Certain temporary facilities.**
- **Minor storage facilities.**



**2010 Florida Building Code – Projected to go into effect 3/15/2012**

**OCCUPANCY**

**CATEGORY NATURE OF OCCUPANCY**

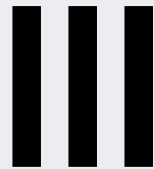
**Buildings and other structures except those listed in Occupancy Categories I, III and IV**





2010 Florida Building Code – Projected to go into effect 3/15/2012

## OCCUPANCY




## CATEGORY NATURE OF OCCUPANCY

Buildings and other structures that represent a substantial hazard to human life in the event of failure, including but not limited to:

- Buildings and other structures whose primary occupancy is public assembly with an occupant load greater than 300.



# IV

	2010 Florida Building Code – Projected to go into effect 3/15/2012
OCCUPANCY	CATEGORY NATURE OF OCCUPANCY
	<p>Buildings and other structures designated as essential facilities, including but not limited to:</p> <ul style="list-style-type: none"> <li>• <b>Group I-2</b> occupancies having <b>surgery or emergency treatment facilities</b>.</li> <li>• <b>Fire, rescue, ambulance and police stations</b> and emergency vehicle garages.</li> <li>• Designated earthquake, hurricane or other emergency <b>shelters</b>.</li> </ul> 

2010 Florida Building Code – Projected to go into effect 3/15/2012

OCCUPANCY

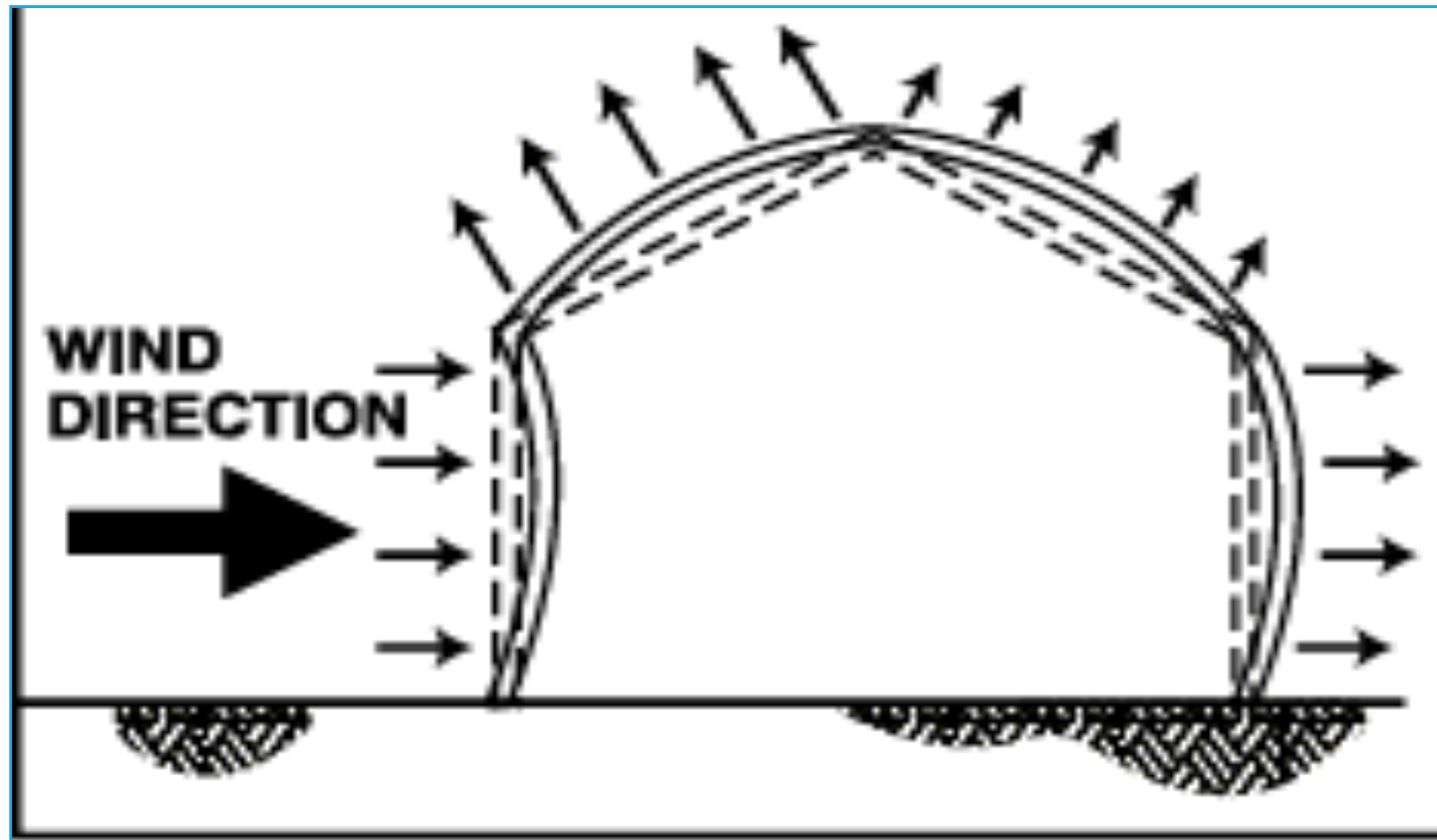
CATEGORY NATURE OF OCCUPANCY

- Structures containing **highly toxic** materials as defined by Section 307 where the quantity of the material exceeds the maximum allowable quantities of Table 307.1(2).
- **Aviation control towers**, air traffic control centers and emergency aircraft hangars.
- Buildings and other structures having **critical national** defense functions.
- Water storage facilities and pump structures required to maintain water pressure for fire suppression.



IV

## Wind Forces on Enclosed Buildings

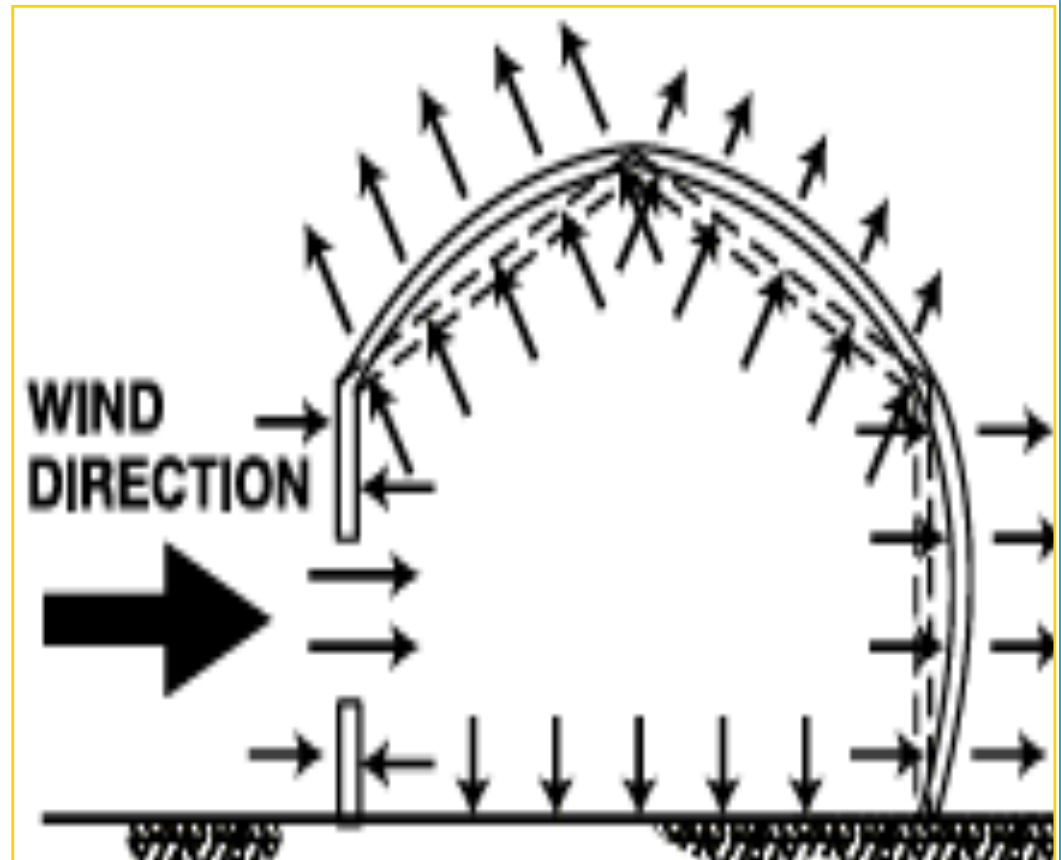


**Airflow separates at sharp edges & corners causes turbulence**

**Eaves, ridges, corners of walls and roofs acted on by localized negative pressure**

# “Exploding” Phenomenon caused by partially enclosed structure

- Conventional buildings allow air to escape *relieving* effects of atmospheric pressure change
- Failure is caused by *direct effects* of winds causing uplift on the roof & suction on the leeward & side walls
- Indirect damage results from *missile impacts*





# “Exploding” Phenomenon



# Testing Requirements By States

	<b>Florida (HVHZ) High Velocity Hurricane Zone</b>	<b>Florida Outside HVHZ</b>	<b>All Other States Using IBC Code</b>
<b>Static Load Testing</b>	TAS 202	ASTM E330	ASTM E330
<b>Impact testing</b> (Wind zones over 140 mph or 130 mph within 1 mile of Coast)	TAS 201	ASTM E1996	ASTM E1996
<b>Cycle Testing</b>	TAS 203	ASTM E1886	ASTM E1886
<b>Component Testing</b>	No further testing, evaluation of assembly test	ANSI A250.13	NONE

# Design Pressures Required on Construction Documents

- Design pressures are determined by using a document called ASCE-7, "Minimum Design Loads for Buildings and Other Structures" or by wind tunnel testing.

## IN FLORIDA

- Design Pressure Requirements for Project (Sec.1606.1.7 FBC)  
Each Opening – Entire Project (Sec.2411.3.1.4 HVHZ)

## IN THE IBC

- Sec. 1603.1 states: The design loads and other information pertinent to the structural design required by Sections 1603.1.1 through 1603.1.8 shall be clearly indicated on the construction documents for parts of the building or structure.

# Building Design Affects Design Pressure



- Location of doors does affect design pressure for the opening.
- Ultimately design pressure for building zones is most efficient. Single design pressure is worst case conditions.



# What Are We Inspecting

All of These...Equally

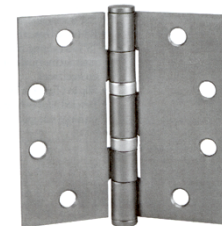
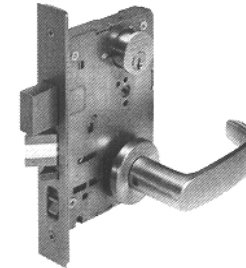
Doors



Standard Duty



Hardware



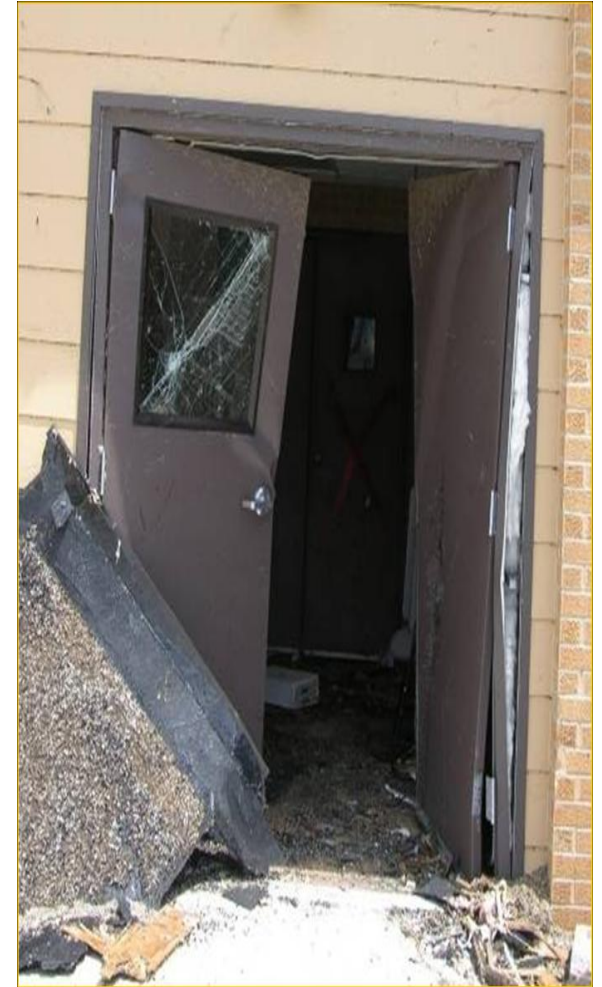
Frames



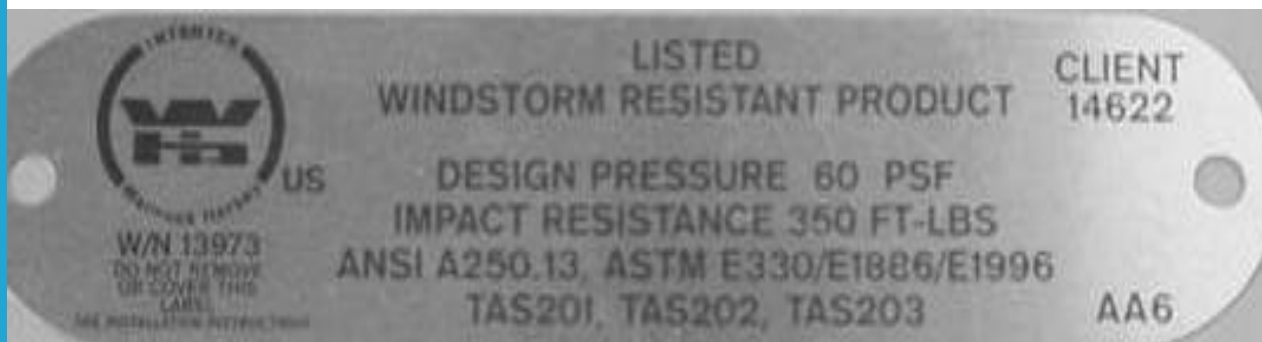
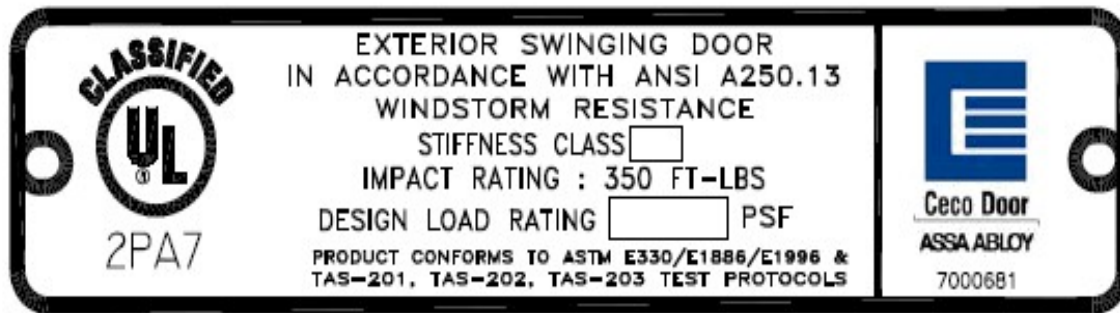


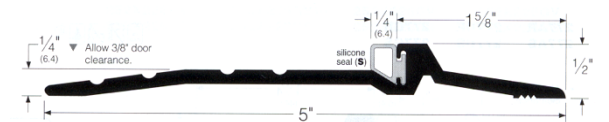
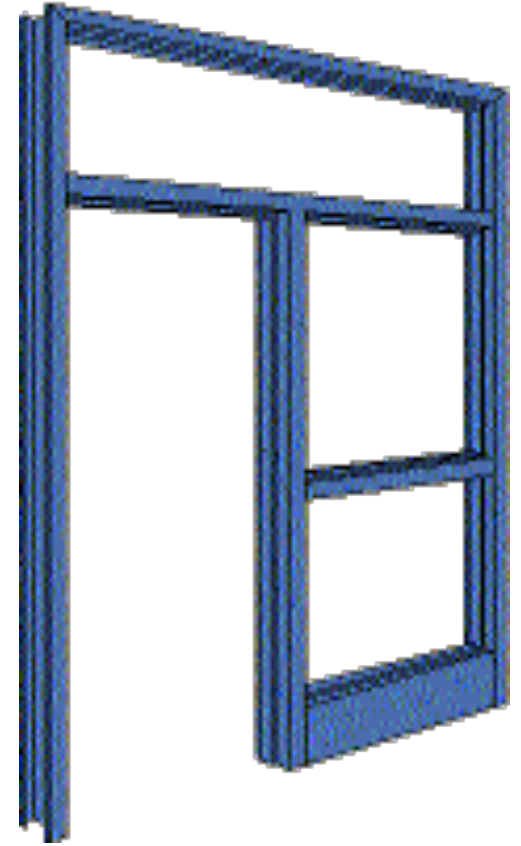
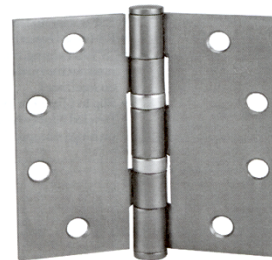
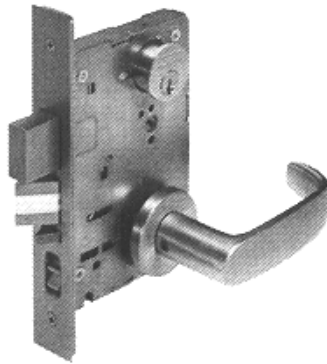
# The most critical structural component for door openings ?

- By far is the hardware
  - A wide majority failures in the test lab is a result of latch point failure
  - Either the latch comes out of the strike or there is a reinforcement failure
- The door is rarely the cause of failure
- Using the correct hardware is critical to the operation of the door in severe wind events
- How can you be sure that the hardware has been tested to the correct pressure and it hasn't changed from when it was tested?



# Look For The Label To Be Assured Of Tested Requirements





# What is ANSI A250.13?

- ANSI A250.13 is a **testing standard** that, when passed, **certifies components** (frame, door, latching hardware and hinge) to be hurricane-resistant up to a stated level
- This test standard was developed by industry leading organizations and its members: BHMA and SDI
  - Latest improved version adopted by ANSI in 2008



= ANSI A250.13

# What is ANSI A250.13?

- Testing protocols for ANSI A250.13 include:
  - Cycle testing to Florida and IBC codes (ASTM E1886) or to the Miami-Dade Requirements (TAS 203)
  - Impact testing to meet the Florida and IBC codes (ASTM E 1996) or to the Miami-Dade Requirements (TAS201)
  - Static Pressure Testing to Florida and IBC codes (ASTM E 330) or to the Miami-Dade requirements (TAS 202)
- **Successful** testing and **certification** requires all product to be independent third-party certified, under a Quality Assurance program and carry a **mark/label** for ease of inspection





# How to Put Together an Opening Using ANSI A250.13 - The Basics

- All ANSI A250.13 component openings are made up of **four types of components**:
  - Frame
  - Door
  - Latching hardware with or without deadbolt
  - Hinges
- **Design pressure** for each exterior opening of a building should be **designated on the architectural plans** per building code
- If a specific design pressure is required for an opening (e.g. 50 psf), a design pressure of 50 psf or higher can be used to meet the needs of this opening

**Consult the UL and/or ITS websites  
for detailed information on all  
products tested and certified**

# Top Reasons Why to use UL or ITS Windstorm Marks



- **Recognized and trusted sources nationally and internationally** for product safety testing and certification
- **Independent status** allows it to be unbiased in determining if a product meets recognized safety standards or not
- In order to receive these independent third-party marks, the **tests must be witnessed** by these organizations
- Local presence/field offices
- Rigorous **monitoring of label use**: prevents application of labels to non-certified products but licensing and inspections
- Field inspections are made easier by **labeling all components** making up the assembly

## In Review

- Wind load requirements will change in the 2010 Florida Building Code
- New ASCE 7-2010 requirements have changed the wind zone maps are being implemented throughout the country
- Components and Cladding (windows, doors, shutters...etc) are tested to design pressure not wind speed
- Need Design Pressure in LBS/ft<sup>2</sup> (psf)
- Identify Impact requirements.
- Ask for labels on all opening components

# Web Sites To Remember

- **State of Florida DCA - [www.floridabuilding.org](http://www.floridabuilding.org)**
- **Texas Dept. of Insurance - [www.tdi.state.tx.us](http://www.tdi.state.tx.us)**
- **UL - [www.ul.com](http://www.ul.com)**
- **Intertek/Warnock Hersey - [www.specdirect.com](http://www.specdirect.com)**

## Important Facts To Remember

- It is critically important everything works as tested during a hurricane
- Opening products work together and each component is equally important.
- To be assured that your building and the lives inside are protected by making sure the exterior openings have been properly tested and approved
- Look for the label!





- Remember to become aware of the IBC requirements for your area!
- Fill in your information on Form B for proper credit.