Florida Building Code 2014 (5th Edition) Updates
AIA Course #: HTS17BCU
This course qualifies for 2.0 LU/HSW AIA/CES credit
Provider #: A022

CONTINUING EDUCATION AIA

Course Description

Review the most updated 2014 Florida Building Code and discuss how it effects the fenestration industry in regards to Structural Requirements, opening protection, Wind Zones and replacement Fenestration.

Learning Objectives

At the end of the this course, participants will be able to:

- Discuss the most recent changes to the Florida Building Code and how it affects the window industry by reviewing the most significant changes.
- Go over structural requirements, opening protection, Wind Zones and replacement fenestration
- Understand compliance paths as well as new guidelines on the renovation carve out.
- Understand the compliance paths with new Florida Energy Climate Zones.

Credit(s) earned on completion of this course will be reported to AIA CES for AIA members. Certificates of Completion for both AIA members and non-AIA members are available upon request.

This course is registered with AIA CES for continuing professional education. As such, it does not include content that may be deemed or construed to be an approval or endorsement by the AIA of any material of construction or any method or manner of handling, using, distributing, or dealing in any material or product.

Questions related to specific materials, methods, and services will be addressed at the conclusion of this presentation.

FBC Update, 5th Edition (2014)

Uses 2012 ICC as its Base Code as required by Florida Legislature …

- Causing sections to be changed
- Books are even larger due to sections referring to things like ***seismic*** and ***snow loads*** are no longer eliminated

FBC Update, 5th Edition (2014)

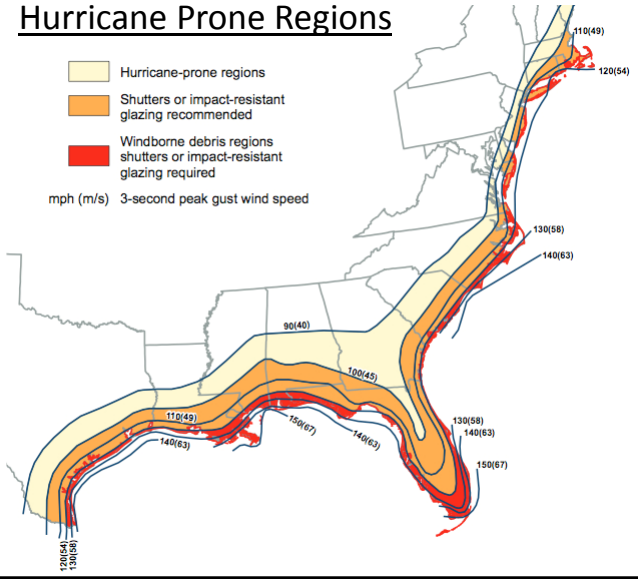
**** Permit, Plan Review and Inspection is required for:***

ALL installation of Impact Resistant coverings

[A] 105.1 Required. Any owner or authorized agent who intends to construct, enlarge, alter, repair, move, demolish, or change the occupancy of a building or structure, or to erect, install, enlarge, alter, repair, remove, convert or replace any **impact resistant coverings,** electrical, gas, mechanical or plumbing system, the installation of which is regulated by this code, or to cause any such work to be done, shall first make application to the *building official* and obtain the required *permit*.

Definitions

Hurricane Prone Regions



Definitions

WIND-BORNE DEBRIS REGION.

Areas within Portions of hurricane prone regions that are located:

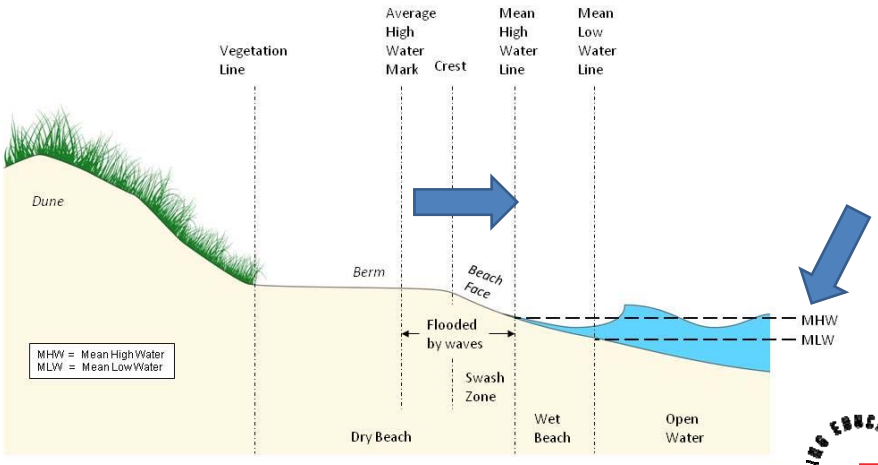
1. Within 1 mile (1.61 km) of the coastal mean high water line where the basic ultimate design wind speed, *Vult*, is 130 mph (58 m/s) or greater;

or

2. In areas portions of hurricane-prone regions where the basic ultimate design wind speed, *Vult*, is 140 mph (63.6 m/s) or greater

Definitions

Mean High Water Line



Definitions

RISK CATEGORY.

Categorization of buildings and other structures for determination of flood, **wind**, snow, ice, and earthquake **loads** *based on the risk associated with unacceptable performance*

ASCE 7-10 Review

ASCE Standard 7-10

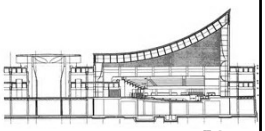
Table 1.5-1 of ASCE7-10 is shown below. ASCE7-10 has changes the language **"Occupancy Category"** to **"Risk Category".**

Risk Category I Buildings and other structures that represent a low hazard to human life in the event of failure:

- Agricultural facilities
- Certain temporary facilities
- Minor storage facilities
- Screen enclosures

Risk Category II Buildings and other structures except those listed in Risk Category I, III and IV.

ASCE 7-10 Review



Risk Category III Buildings and other structures that represent a substantial hazard to human life in the event of failure:

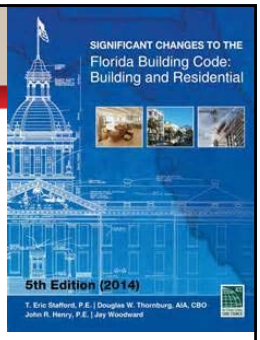
- Public assembly covered structures with an occupant load > 300
- School and daycare facilities with an occupant load >250
- Colleges, Universities or adult education facilities with an occupant load >500
- Health care facilities with an occupant load >50 but not having Surgery or Emergency treatment facilities.
- Jails and detention facilities
- Any other occupancy with an occupant load >5000
- Power generating stations, water treatment for potable water, waste water treatment facilities and other public utility facilities not included in Risk Cat IV.
- Buildings and other structures not included in Category IV containing toxic or explosive substances to be dangerous to the public if released.

ASCE 7-10 Review

Risk Category IV Buildings if damaged or destroyed would cause significant loss of human life and are determined to be **"designated essential facilities"** Table 1.5-1 places all other non- "designated essential facilities" in I, II, and III.

- Hospitals and other health care facilities having surgery or emergency treatment facilities
- Fire, rescue, police stations and emergency vehicle garages
- Designated Hurricane or other emergency shelters
- Designated emergency preparedness, communication, and operation centers and other facilities required for emergency purposes
- Power-generating stations and other public utility facilities required as emergency backup facilities for Risk Cat IV structures
- Aviation control towers, air traffic control centers and emergency aircraft hangars
- Buildings and other structures having critical national defense functions
- Water treatment facilities required to maintain water pressure for fire

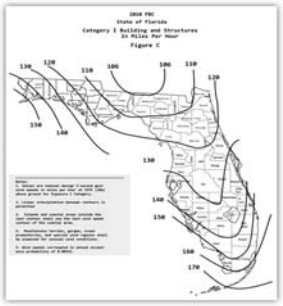
ASCE 7-10 Review



Basic Wind Speeds

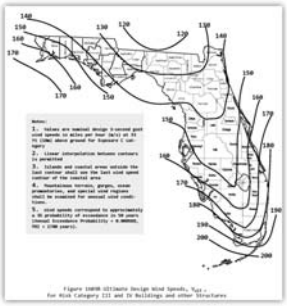
- **3 maps based on:**
  - Risk Category I (300 year return period) Map 1609 A
  - Risk Category II (700 year return period) Map 1609 B
  - Risk Category III and IV (1700 year return period) Map 1609 C
- **Risk Category replaces term Occupancy Category**

Map 1609 A



Map 1609 B

Map 1609 C



ASCE 7-10 Review

1609
Determination of Wind Loads

This change is an update and coordination with the latest wind load provisions in ASCE/SEI 7 (ASCE 7-10) and the wind load maps are based on Vult which produces a strength level wind load similar to seismic load effects.

Vasd = Vult √0.6

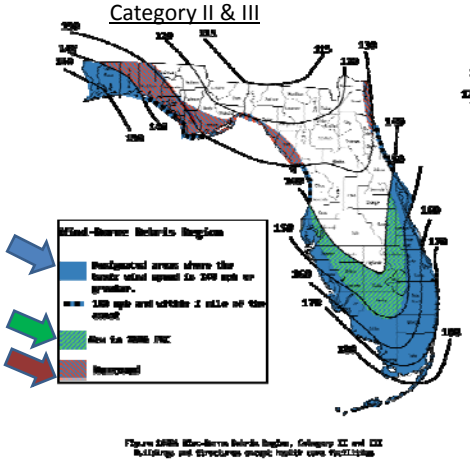
Equation 16-33, conversion of wind speed from Vult to Vasd

Vult **=** Ultimate design wind speeds.
VASD **=** Nominal design wind speeds.

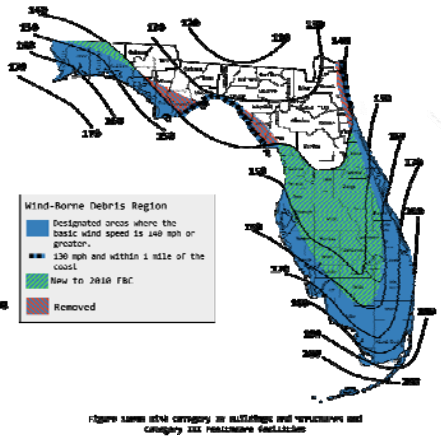
Wind Borne Debris Maps

Wind Borne Debris Region for Buildings and Structures

Category II & III

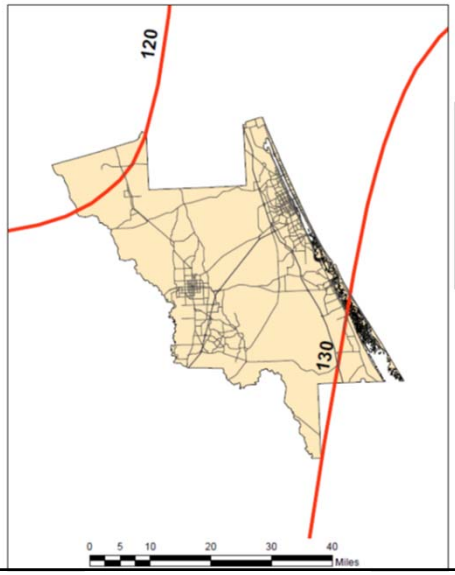


Category IV (Cat III Healthcare)



DESIGNATED 140 MPH ADDED REMOVED

ASCE 7-10 Review

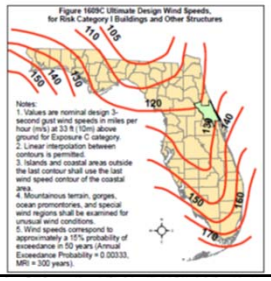


VOLUSIA
Figure 1609C
Ultimate Design Wind Speeds
Risk Category I Buildings

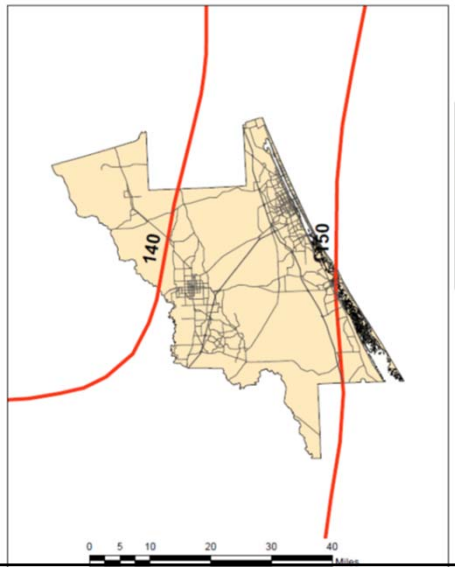
BASIC WIND SPEED. The basic wind speed in miles per hour, for the development of wind loads, shall be determined from Figure 1609. The exact location of wind speed lines shall be established by local ordinance using recognized physical landmarks such as major roads, canals, rivers and lake shores whenever possible.

WIND-BORNE DEBRIS REGION. Areas within hurricane- prone regions located:
1. Within 1 mile (1.61 km) of the coastal mean high water line where the ultimate design wind speed Vult is 130 mph (48 m/s) or greater; or
2. In areas where the ultimate design wind speed Vult is 140 mph (53 m/s) or greater

For Risk Category II buildings and structures and occupancy category III buildings and structures, except health care facilities, the windborne debris region shall be based on Figure 1609A. For occupancy category IV buildings and structures and occupancy category III health care facilities, the windborne debris region shall be based on Figure 1609B.



ASCE 7-10 Review



VOLUSIA
Figure 1609B
Ultimate Design Wind Speeds
Risk Category III and IV Buildings

BASIC WIND SPEED. The basic wind speed in miles per hour, for the development of wind loads, shall be determined from Figure 1609. The exact location of wind speed lines shall be established by local ordinance using recognized physical landmarks such as major roads, canals, rivers and lake shores whenever possible.

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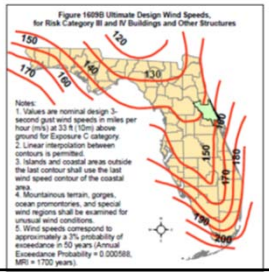
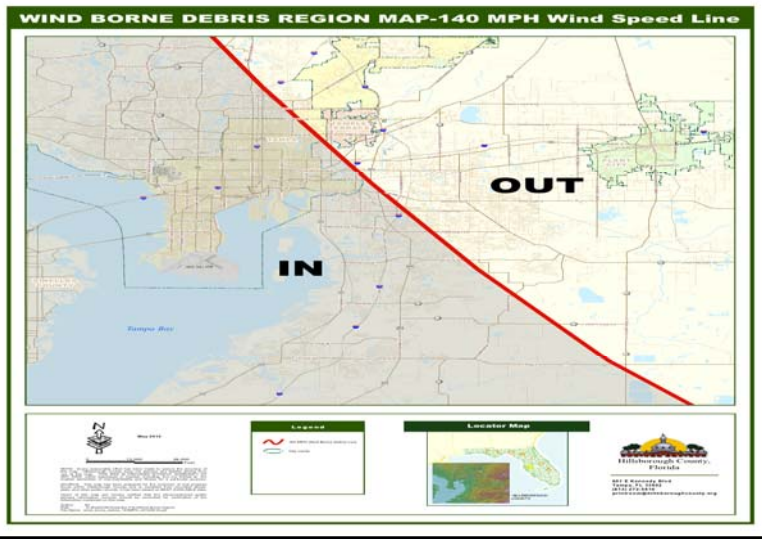


ASCE 7-10 Review

Hillsborough County, Florida

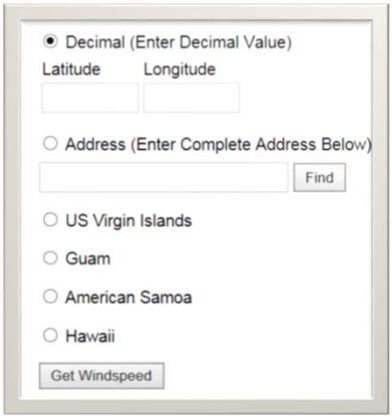


ASCE 7-10 Review

Wind Speeds

www.atcouncil.org/windspeed

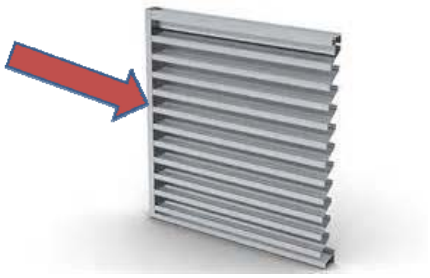
New wind speed app

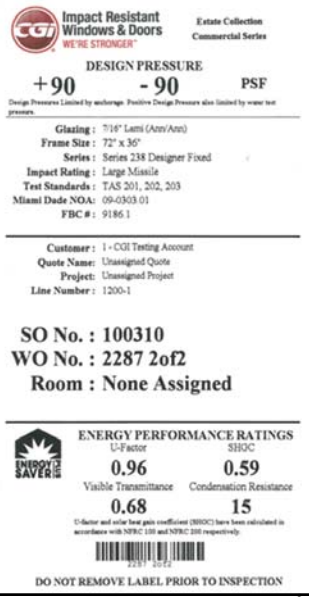


Structural Requirements

- ***Labeling*** provisions retained

- Adds ***Impact*** **Resistant Coverings** for protection of louvers





Opening Protection

- R301.2.1.2 Protection of openings. ~~Exterior glazing~~ **Glazed openings** in buildings located in windborne debris regions shall be protected from windborne debris. Glazed opening protection for windborne debris shall meet the requirements of the Large Missile Test of ASTM E 1996 and ASTM E 1886 referenced therein, SSTD 12, TAS 201, 202 and 203, or AAMA 506, as applicable.

Opening Protection

- 1609.1.2 Protection of openings. In *wind-borne debris regions*, ~~glazing~~ **glazed openings** in buildings shall be impact resistant or protected with an impact-resistant covering meeting the requirements of, SSTD 12, ANSI/DASMA 115 (for garage doors and rolling doors) or TAS 201, 202 and 203, AAMA 506. ASTM E 1996 and ASTM E 1886 referenced herein, or an *approved* impact-resistant standard

Opening Protection

1008.1.4.6

Florida Specific

- The ***temporary installation or closure of storm shutters, panels and other approved hurricane protection devices shall be permitted on emergency escape and rescue openings in Group R occupancies during the threat of a storm.*** Such devices shall not be required to comply with the operational constraints of Section 1029.4. While such protection is provided, ***at least one means of escape*** from the dwelling or dwelling unit shall be provided. The means of escape shall be within the first floor of the dwelling or dwelling unit and shall not be located within a garage without a side hinged door leading directly to the exterior. Occupants in any part of the dwelling or dwelling unit shall be able to access the means of escape without passing through a lockable door not under their control.

Replacement Fenestration

- *ALL replacement fenestration will have to meet the 2014 Florida Energy Code on the current effective date of June 30th, 2015.*

- This change, as adopted in the 2014 Florida Energy Code, added "*Replacement fenestration*" to the definition of "*components*"..

Replacement Fenestration-**Clarifications**

R101.4.7 Building Systems and Components

Thermal efficiency standards are set for the following building systems and ***components*** ***where new products are installed or replaced in existing buildings, and for which a permit must be obtained.*** New products shall meet the minimum efficiencies allowed by this code for the following systems and ***components***:

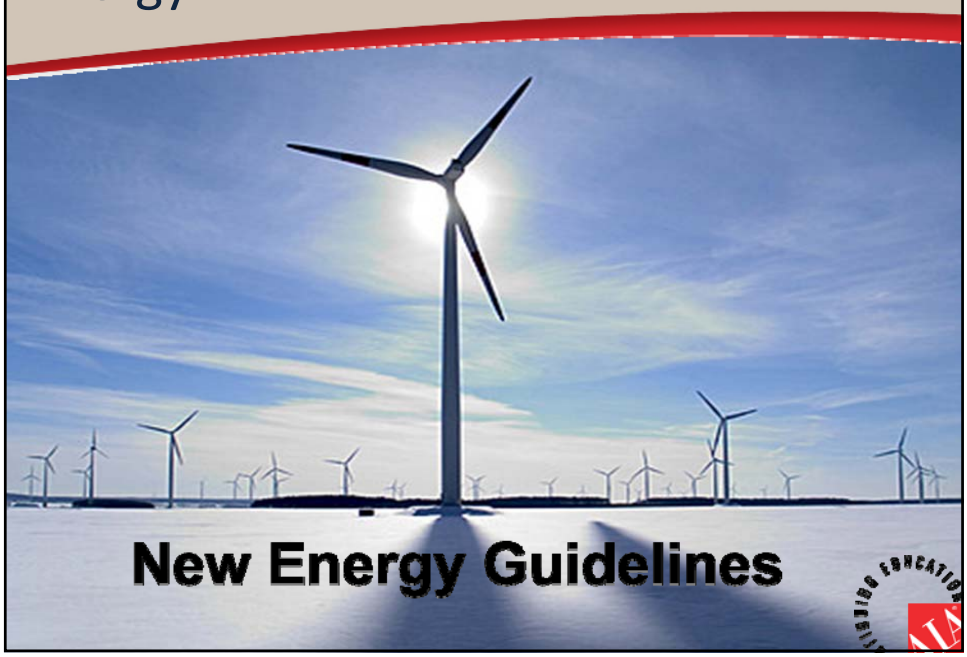
Heating, ventilating or air conditioning systems;
Service water or pool heating systems;
Lighting systems;
Replacement Fenestration

Same Language in Commercial

C101.4.7 Building Systems and Components.

Heating, ventilating or air conditioning systems;
Service water or pool heating systems;
Lighting systems;
Replacement Fenestration

Energy



New Energy Guidelines

Definitions / Energy

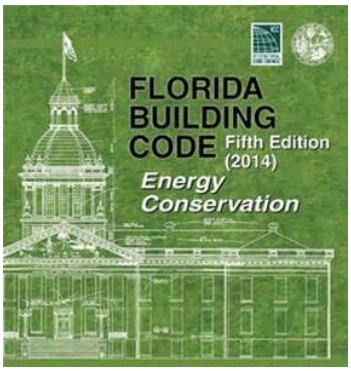
Information you need to know:

- Windows and doors are called **" fenestrations"**
- How well a window prevents heat transfer by *conduction* is measured by its **Coefficient of Thermal Resistance** (**U-factor**). The lower the U-factor, the more efficient it is.
- How well a window prevents *radiant heat* from getting into a room is measured by its **Solar Heat Gain Coefficient** (SHGC). The lower the SHGC, the more efficient it is.
- U-factor and SHGC are tested and labeled in accordance with the National Fenestration Rating Council (NFRC) procedures
- **Conduction** is not a big problem in Florida; the temperature differential from inside to outside is small.
- **Radiation** is a big problem in Florida. The sun beats down hard on roofs and radiates through windows.

Energy

The main change as it affects the window industry will be the enforcement of a new Energy Code for Florida.

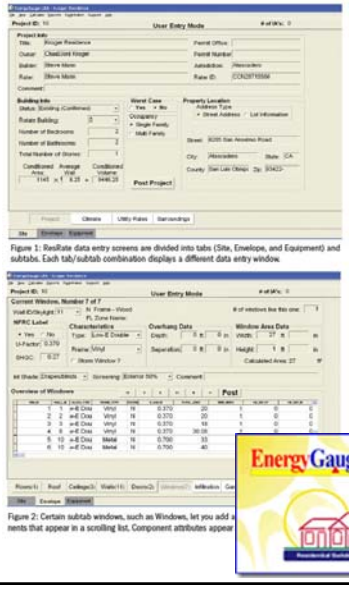
- *The 30% rule has been clarified and will now be null and void*.
- All replacement products will now have to meet the energy code. **No exceptions.**
- New construction will have a choice for following the **performance** or the **prescriptive** paths for compliance .



Energy

Performance Path for compliance

- Designers need to use an energy compliance software tool approved by the Florida Building Commission. This analysis only includes heating, cooling and service water heating.
- Use of this software allows design professionals to perform a ***trade-off*** between U-values and SHGC ratings. When using trade-offs from Section 405, the area weighted average maximum allowed for fenestration *SHGC is 0.50*.



Energy

Performance Path Rule Changes

- Follows national model code
- Eliminated energy score
- Proposed < Baseline
- No credits for window area < 15%
- Changes/Updates to baseline:
  - Tighter air leakage (ducts & buildings)
  - Modified thermostat setpoints
  - Modified interior shades/blinds
  - Better performing window/door products

$$K = \frac{1}{2}mv^2$$

Energy

Energy calcs don't compare

Changes in rule set and in pass/fail "scoring" methodology means you can't compare ratings between new and old code versions

Fenestration Misc.

R402.3.2 Glazed fenestration SHGC. An area-weighted average of fenestration products more than 50-percent glazed shall be permitted to satisfy the SHGC requirements.

R402.3.3 Glazed fenestration exemption. Up to 15 square feet (1.4 m^2) of glazed fenestration per dwelling unit shall be permitted to be exempt from *U*-factor and SHGC requirements in Section R402.1.1. This exemption shall not apply to the *U*-factor alternative approach in Section R402.1.3 and the Total UA alternative in Section R402.1.4.

R405.5.3.4 Maximum fenestration SHGC. The Proposed Design must have either an area-weighted average maximum fenestration SHGC of 0.50 or a window area-weighted average overhang depth of 4.0 feet or greater (all conditioned space windows must be included in the calculation).

(EN5605 AS)

Energy

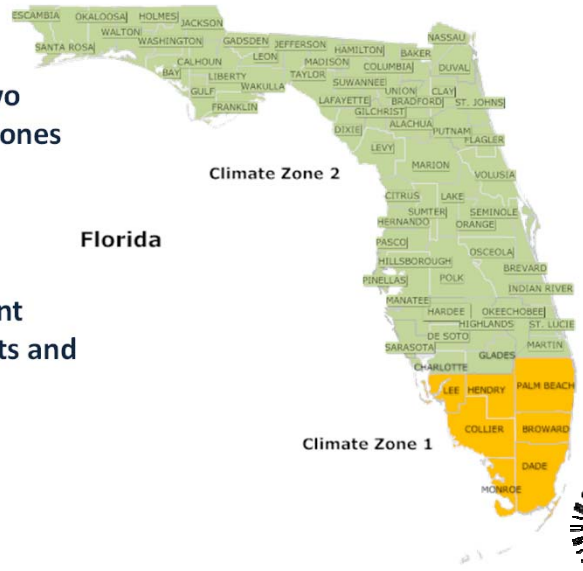
Prescriptive Path *for compliance…*

- With the prescriptive or pre-determined path, designers must ensure that the proposed windows and doors have a U-value and SHGC that meet or exceed the required ratings for their area.
- Windows and doors must bear the ***label with the energy ratings*** independently confirmed by **National Fenestration Rating Council (NFRC).**
- Section 402.3.2 of the code specifies that when the U-factor varies between the fenestration products, the use of area-weighted averaging is allowed to satisfy the U-factor requirements.

Florida Energy Climate Zones

There are now two specific Climate Zones in Florida.

Both with different code requirements and product needs.



Florida Energy Climate Zones

Prescriptive Path

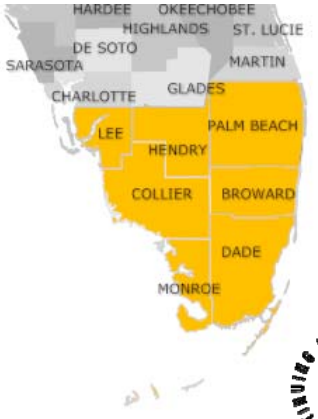
Zone 1 **(Dade, Broward, Monroe, Palm Beach, Collier, Lee, Hendry Counties)**

Commercial Section

U-factor < 0.50 Fixed Fenestration
U-factor < 0.65 Operable Fenestration
U-factor < 1.1 Entrance Doors
SHGC < 0.25 **(previous 0.30)**

Residential Section

Impact Resistant U-factor < 0.75
Non-Impact U-factor < 0.65
SHGC < 0.25 **(previous 0.30)**



Florida Energy Climate Zones

What does this mean? …

Zone 1 (Dade, Broward, Monroe, Palm Beach, Collier, Lee, Hendry Counties)

Non-Impact windows U .65 SHGC .25

- Aluminum will still be available but will be Insulated High Performance LowE. No option for Monolithic glass in non-impact windows,
- Vinyl will be more widely introduced into the market to meet codes.

Impact windows U .75 SHGC .25

- Aluminum will still be available but most manufacturers will have to use Insulated Impact – High Performance LowE.
- Vinyl will be more widely introduced into the market. Limitation will be structural DP Ratings.

Florida Energy Climate Zones

Prescriptive Path

Zone 2 – All Florida except Climate Zone 1.

Commercial Section

U-factor < 0.50 Fixed Fenestration

U-factor < 0.65 Operable Fenestration

U-factor < 0.83 Entrance Doors

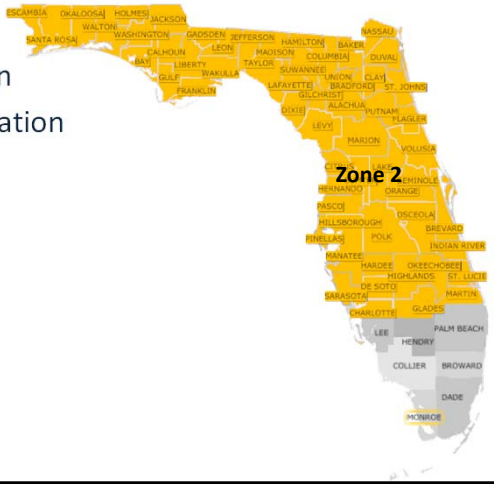
SHGC < 0.25

Residential Section

Impact Resistant U-factor < 0.65

Non-Impact Resistant < 0.40

SHGC < 0.25



Florida Energy Climate Zones

What does this mean? …

Zone 2 (All of Florida outside of Zone 1)

Non-Impact windows **U .40 SHGC .25**

- Aluminum will no longer be able to be used outside Zone 1 for replacement applications.
- Zone 2 will become a vinyl market.

Impact windows **U .65 SHGC .25**

- Aluminum may still be available, but some current products cannot meet the .65 U value. .25 SHGC can be achieved with High Performance IG Glass.
- Most jobs will require vinyl impact, which will have High Performance IG Glass.

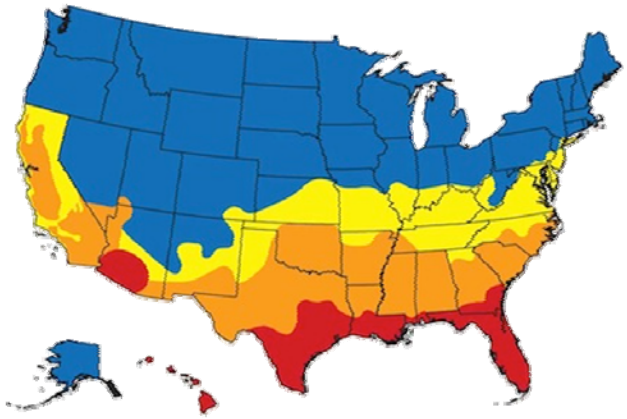
Energy Star

Energy Star 6.1

EPA - Environmental Protection Agency

DOE - Department of Energy

Energy Star 6.1



Energy Star Comparison

	ENERGY STAR as of 2014			
	Windows		Doors	
	U	SHGC	U	SHGC
N	=<.30	Any	=<.32	=<.30
	.31	>=.35	=<.32	=<.30
	.32	>=.40	=<.32	=<.30
NC	=<.32	=<.40	=<.32	=<.30
SC	=<.35	=<.30	=<.32	=<.30
S	=<.60	=<.27	=<.32	=<.30

	ENERGY STAR 2015/2016*			
	Windows		Doors	
	U	SHGC	U	SHGC
N*	=<.27	Any	=<.30	=<.40
	.28	>=.32		
	.29	>=.37		
	.30	=>.42		
NC	=<.30	=<.40	=<.30	=<.40
SC	=<.30	=<.25	=<.30	=<.25
S	=<.40	=<.25	=<.30	=<.25

NORTHERN | NORTH-CENTRAL | SOUTH-CENTRAL | SOUTHERN

Summary

- Add (4) counties to Zone 1
- Baseline windows are more stringent
- Performance path rule set changes
- Can't compare ratings Old vs New
- Window trade-offs more stringent
- Replacement Windows follow Code (exceptions)
- Commercial material neutral

THANK YOU FOR YOUR KIND ATTENTION

This concludes The American Institute of Architects Continuing Education Systems Course

ANY QUESTIONS?

Impact Resistant Windows & Doors
WE'RE STRONGER™

Oscar E. Cordova, Sr.
ocordova@cgiwindows.com
800.442.9042

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