Course material on 8th edition 2023 Advanced FBC 1609

FBC 2020 previous course number 0612347

Introduction

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Explanation of the course: This course offers a basic overview of wind load requirements, components, and cladding design requirements in wind load regions for contractors installing windows, doors and exterior coverings. The course seeks to impart a basic understanding of components, loads, and opening protection requirements to the structure per FBC 1609. The course will explore the existing conditions of structures that existed prior to the Florida Building Code, and will discuss issues with regards to component and cladding replacements, remodeling, renovations and upgrades in pre-Florida Building Code structures. The course will give examples of actual components and cladding installations complying with the FBC. All work projects presented were permitted and inspected by the local building officials.

Learning Objectives:

- Be able to understand and interpret the required wind load maps
- Understand Risk Categories" based on the building use
- Know when opening protectives are required for Wind Borne Debris Regions
- Understand enclosed and partially enclosed buildings
- Understand how buildings fail in wind events
- Distinguish the three Exposure Categories
- Define Risk Categories based on the nature of occupancy

- Understand MWFDS and components and cladding and their respective requirements.
- Know the different building zones and how wind pressures affect them.
- Select fastener types and spacing for wood structural panels in wind-borne debris areas
- Be able to select approved components under the Florida Product Approval system
- Know special requirements for impact resistant components in Chapter 17.

Topics course will cover and discuss

- Introduction
- Wind maps (Figures 1609.3(1), 1609.3(2), 1609.3(3), 1609.3(4)
- Determination of Wind Loads 1609.1
- Protection of Openings 1609.1.2.4.2
- Exposure categories 1609.4.3
- Impact Resistant components 1710, 1609.1.2.4
- Wind Borne Debris Region 1609.3

Wind maps Chapter 1609

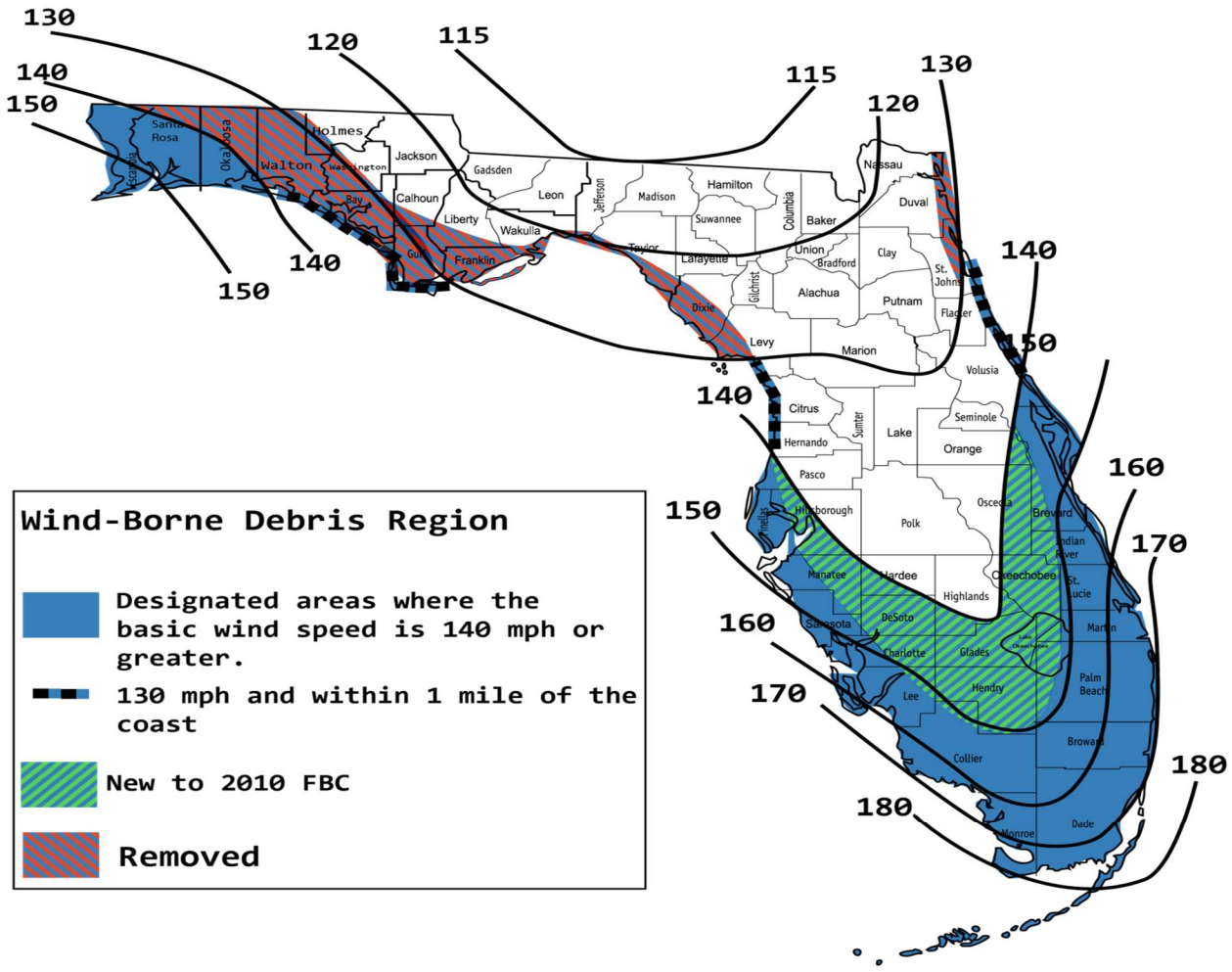


Figure 1609A Wind-Borne Debris Region, Category II and III
Buildings and Structures except health care facilities

FIGURE 1609.3(1) ULTIMATE DESIGN WIND SPEEDS, V_{ULT}, FOR RISK CATEGORY II BUILDINGS AND OTHER STRUCTURES

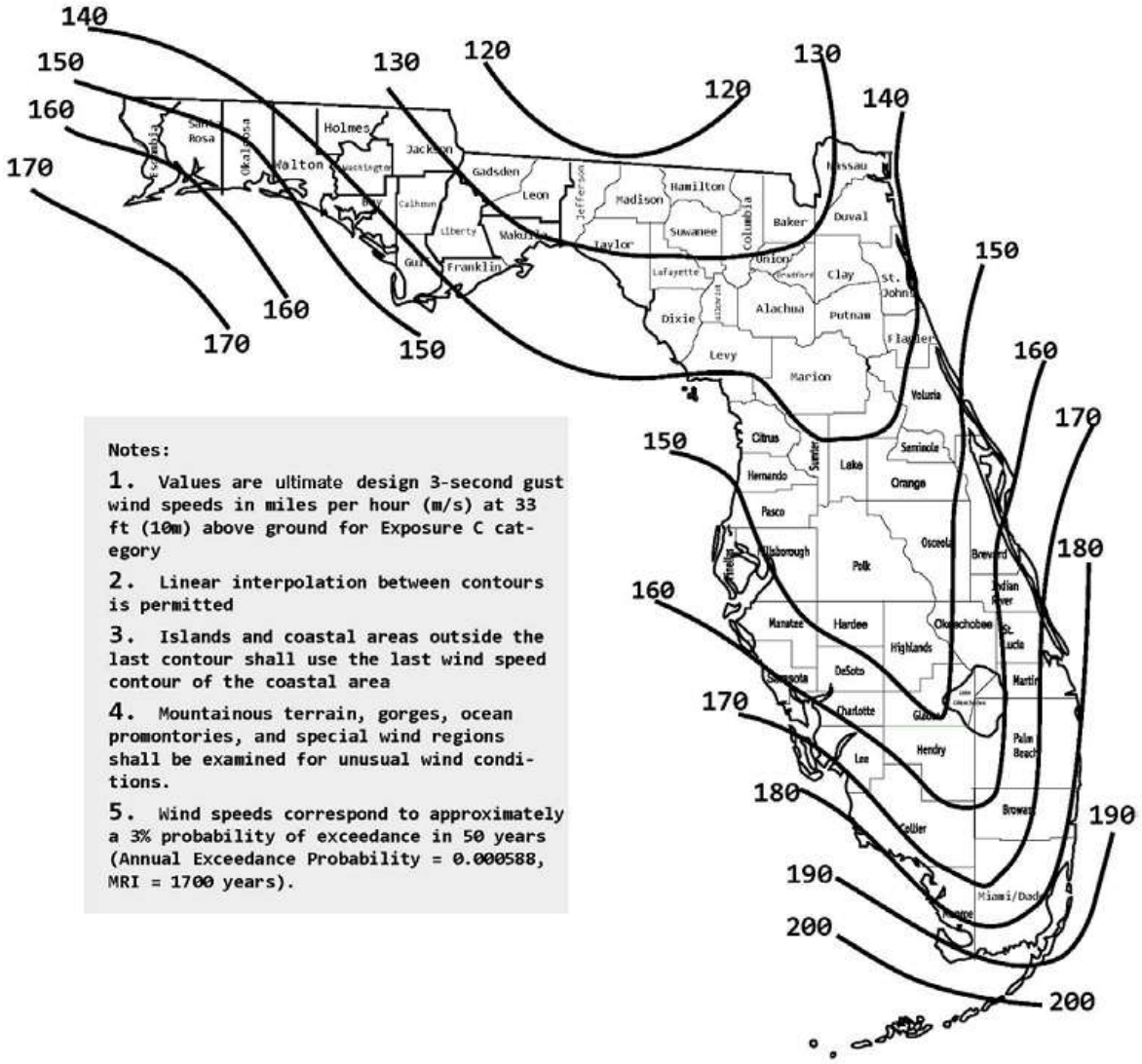


FIGURE 1609.3(2) ULTIMATE DESIGN WIND SPEEDS, V_{ULT}, FOR RISK CATEGORY III AND IV BUILDINGS AND OTHER STRUCTURES

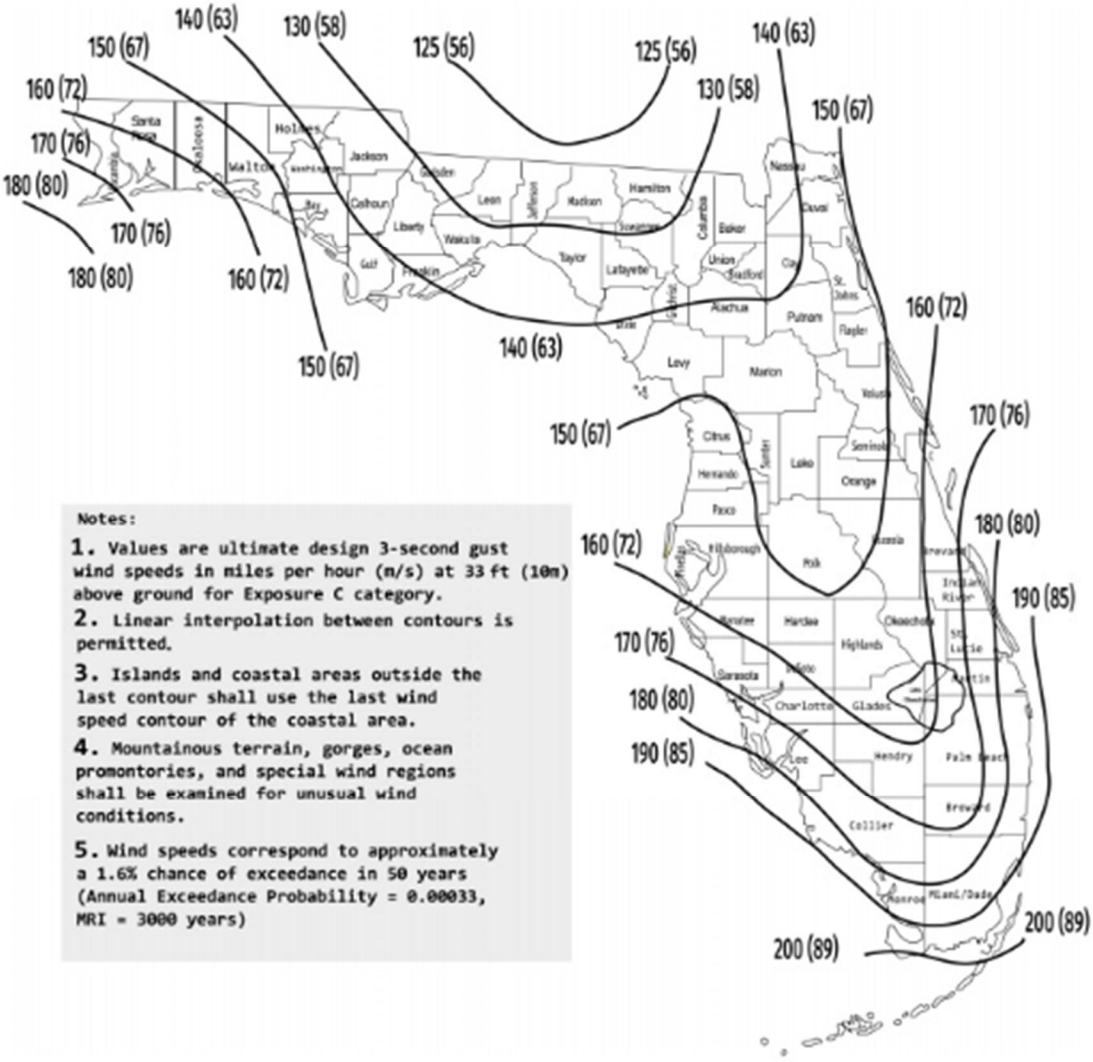


FIGURE 1609.3(3) ULTIMATE DESIGN WIND SPEEDS, V_{ULT}, FOR RISK CATEGORY IV BUILDINGS AND OTHER STRUCTURES

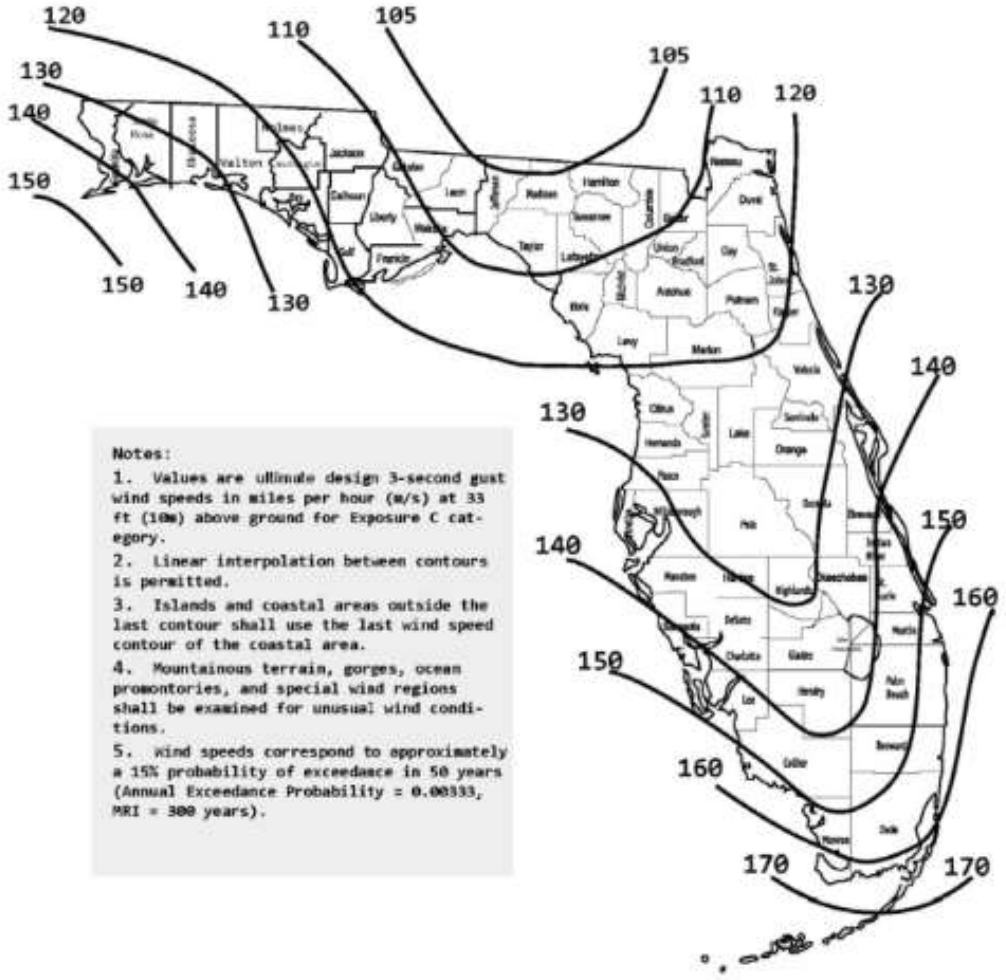
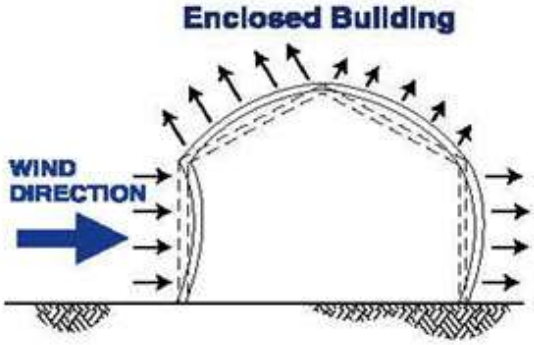


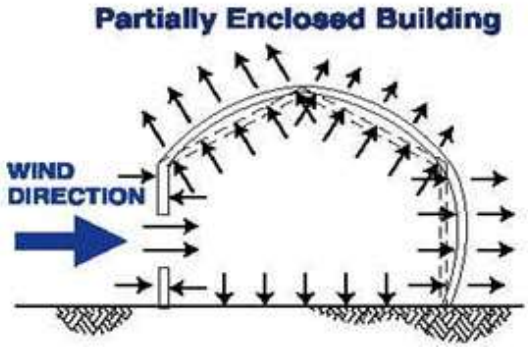
FIGURE 1609.3(4) ULTIMATE DESIGN WIND SPEEDS, V_{ULT}, FOR RISK CATEGORY I BUILDINGS AND OTHER STRUCTURES

1609.1.1 Determination of wind loads.
Wind loads on every building or structure shall be determined in accordance with Chapters 26 to 30 of ASCE 7 or provisions of the alternate all-heights method in Section 1609.6. Wind shall be assumed to come from **any horizontal direction** and wind pressures shall be assumed to act normal to the surface considered.

1609.3 Ultimate design wind speed. The ultimate design wind speed, *Vult*, in mph, for the determination of the wind loads shall be determined by Figures 1609.3(1), 1609.3(2), 1609.3(3) and 1609.3(4). The ultimate design wind speed,

Vult, for use in the design of Risk Category II buildings and structures shall be obtained from Figure 1609.3(1). The ultimate design wind speed, *Vult*, for use in the design of Risk Category III buildings and structures shall be obtained from Figure 1609.3(2). The ultimate design wind speed, *Vult*, for use in the design of Risk Category IV buildings and structures shall be obtained from Figure 1609.3(3). The ultimate design wind speed, *Vult*, for use in the design of Risk Category I buildings and structures shall be obtained from Figure 1609.3(4). The ultimate design wind speed, *Vult*, for the special wind regions indicated near mountainous terrain and near. gorges shall be in accordance with local jurisdiction requirements. The ultimate design wind speeds, Vult, determined by the local jurisdiction shall be in accordance with Chapter 26 of ASCE 7. 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 wherever possible.





Protection of openings

1609.1.2 Protection of Openings

In wind-borne debris regions, glazed openings in buildings shall be impact resistant or protected with an impact-resistant covering
Exception:
Wood structural panels with a minimum thick-ness of 7/16 inch (11.1 mm) and maximum span between lines of fasteners of 44 inches (1118 mm) shall be permitted for opening protection in Group R-3 or R-4 occupancy buildings with a mean roof height of 33 feet (10 058 mm) or less where V_{ult} is 180 mph (80 m/s) or less. Panels shall be precut to overlap the wall such that they extend a minimum of 2 inches (50.8 mm) beyond the lines of fasteners and are attached to the framing surrounding the opening containing the product with the glazed opening. Panels shall be predrilled as required for the attachment method and secured with corrosion-resistant attachment hardware permanently installed on the building.
a. Attachments shall be designed to resist the components and cladding loads determined in accordance with the provisions of ASCE 7, with corrosion-resistant attachment hardware provided and anchors permanently installed on the building.
b. As an alternative, panels shall be fastened at 16 inches (406.4 mm) on center along the edges of the opposing long sides of the panel.
i. For wood frame construction, fasteners shall be located on the wall such that they are embedded into the wall framing members, nominally a minimum of 1 inch (25.4 mm) from the edge of the opening and 2 inches (50.8 mm) inward from the panel edge. Permanently installed anchors used for buildings with wood frame wall construction shall have the threaded portion

that will be embedded into the wall framing based on 1/4-inch (6.35 mm) lag-screws and shall be long enough to penetrate through the exterior wall covering with sufficient embedment length to provide an allowable minimum 300 pounds ASD design withdrawal capacity.

ii. For concrete or masonry wall construction, fasteners shall be located on the wall a minimum of 1 ½ inches (37.9 mm) from the edge of the opening and 2 inches (50.8 mm) inward of the panel edge. Permanently installed anchors in concrete or masonry wall construction shall have an allowable minimum 300 pounds ASD design withdrawal capacity and an allowable minimum 525 pounds ASD design shear capacity with a 1 ½ inch edge distance. Hex nuts, washered wing-nuts, or bolts used to attach the wood structural panels to the anchors shall be minimum 1/4-inch (6.4 mm) hardware and shall be installed with or have integral washers with a minimum 1-inch (25 mm) outside diameter.

iii. Vibration-resistant alternative attachments designed to resist the component and cladding loads determined in accordance with provisions of ASCE 7 shall be permitted.

1609.1.2.4.2 Impact-resistant coverings.

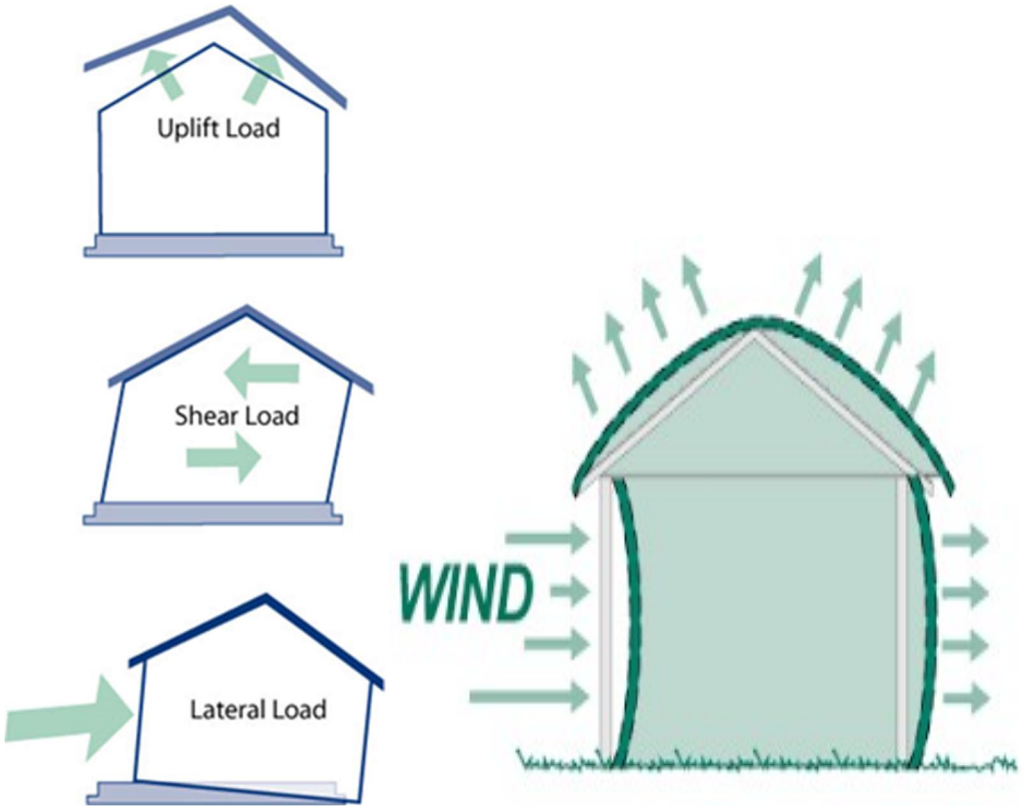
Impact resistant coverings shall be labeled in accordance with the provisions of Section 1709.9.

Building departments require wood panels to be labeled for reinstallation location on the structure.

Panel Location labels are required by some building departments

Protecting the openings of the structure is important to keeping the structure from being pressurized.

When the structure becomes pressurized it blows out the weakest panel or segment of the structure.
Entire roof structures can be blown off the walls.
The weakest and largest opening can fail.
Usually, the garage door can implode from the rail or worn rollers that could be out of alignment



1609.4.3 Exposure categories.
An exposure category shall be determined in accordance with the following:

Exposure B. For buildings with a mean roof height of less than or

equal to 30 feet (9144 mm), Exposure B shall apply where the ground surface roughness, as defined by Surface Roughness B, prevails in the upwind direction for a distance of at least 1,500 feet (457 m). For buildings with a mean roof height greater than 30 feet (9144 mm), Exposure B shall apply where Surface Roughness B prevails in the upwind direction for a distance of at least 2,600 feet (792 m) or 20 times the height of the building, whichever is greater.

Exposure C. Exposure C shall apply for all cases where Exposures B or D do not apply.

Exposure D. Exposure D shall apply where the ground surface roughness, as defined by Surface Roughness D, prevails in the upwind direction for a distance of at least 5,000 feet (1524 m) or 20 times the height of the building, whichever is greater. Exposure D shall also apply where the ground surface roughness immediately upwind of the site is B or C, and the site is within a distance of 600 feet (183 m) or 20 times the building height, whichever is greater, from an exposure D condition as defined in the previous sentence.

Critical Facilities require additional engineering with wind load increases.

1609.6 Alternate all-heights method

Removed from code

1609.6.4.1 Main windforce-resisting systems.

Removed from code

1609.6.4 Design procedure.

Removed from code

This Auto Parts store roof structure was not properly secured and was blown off by Hurricane Charlie

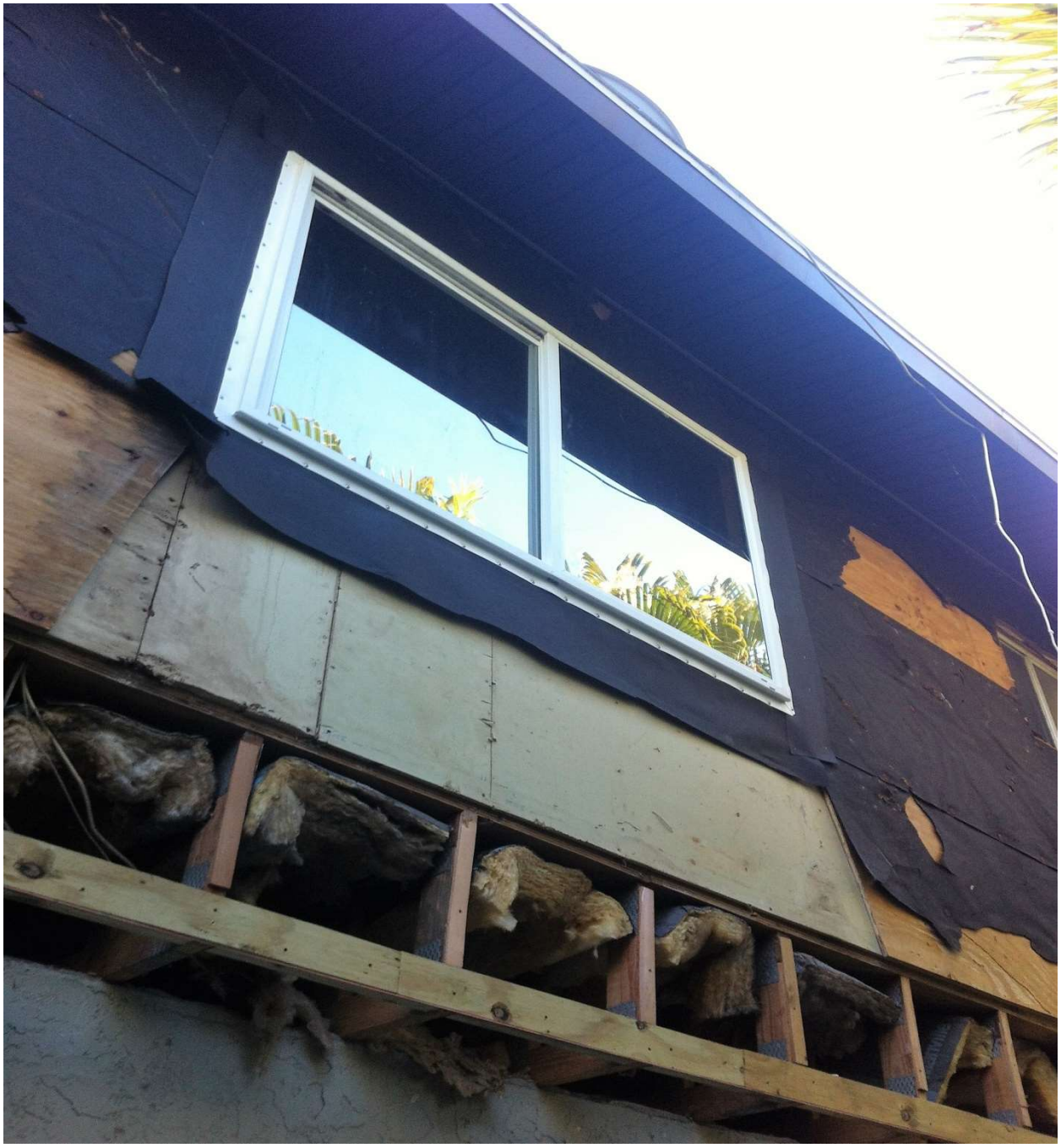
1609.6.4.4 Application of wind pressures.

Removed from code

This two-story duplex constructed in 1986 had major termite damage due to improper window installation.

Existing perimeter sheathing was cut and divided at floor level. Full bottom base plywood was installed tying the floor system with the wall framing. All fasteners are #10 screws.

Fin windows are installed with #10 Stainless truss head screws.



Truss blocking and load path corrections was replaced, added and repaired. New windows correctly installed will keep the building water tight and more energy efficient.

Wind pressure for each component or cladding element is applied as follows using C_{net}

1609.6.4.4.1 Components and cladding.

Removed from code

1609.7 Garage doors and rolling doors.

Pressures from Table 1609.7(1) for wind loading actions on garage doors and rolling doors for buildings designed as enclosed shall be permitted.

TABLE 1609.7(1)

NOMINAL (ASD) GARAGE DOOR AND ROLLING DOOR WIND LOADS FOR A BUILDING WITH A MEAN ROOF HEIGHT OF 30 FEET LOCATED IN EXPOSURE B (PSF)[1, 2, 3, 4, 5]

ULTIMATE DESIGN WIND SPEED (V_{ult}) DETERMINED IN ACCORDANCE WITH SECTION 1609.3 (MPH - 3 SECOND GUST)

Width (ft)	Height (ft)	100 MPH		110 MPH		120 MPH		130 MPH		140 MPH		150 MPH		160 MPH		170 MPH		180 MPH		190 MPH		200 MPH	
Roof Angle 0 – 10 degrees																							
		+	–	+	–	+	–	+	–	+	–	+	–	+	–	+	–	+	–	+	–	+	–
8	8	10.0	10.0	10.5	11.9	12.5	14.2	14.7	16.6	17.1	19.3	19.6	22.2	22.3	25.2	25.1	28.5	28.2	31.9	31.4	35.5	34.8	39.4
		+	–	+	–	+	–	+	–	+	–	+	–	+	–	+	–	+	–	+	–	+	–
10	10	10.0	10.0	10.2	11.4	12.1	13.6	14.2	16.0	16.5	18.5	18.9	21.2	21.5	24.2	24.3	27.3	27.3	30.6	30.4	34.1	33.7	37.8
		+	–	+	–	+	–	+	–	+	–	+	–	+	–	+	–	+	–	+	–	+	–
14	14	10.0	10.0	10.0	10.8	11.5	12.8	13.5	15.0	15.7	17.4	18.0	20.0	20.5	22.8	23.1	25.7	25.9	28.8	28.9	32.1	32.0	35.6
Roof Angle > 10 degrees																							

9	7	+10.0	– 10.9	+ 11.4	– 12.9	+ 13.7	– 15.5	+ 16.1	– 18.2	+ 18.5	– 20.9	+ 21.3	– 24.1	+ 24.3	– 27.5	+ 27.6	– 31.2	+ 30.6	– 34.6	+ 34.2	– 38.6	+ 38.0	– 43.0
16	7	+10.0	– 10.3	+ 10.9	– 12.2	+ 13.1	– 14.6	+ 15.5	– 17.2	+ 17.7	– 19.7	+ 20.4	– 22.7	+ 23.3	– 26.0	+ 26.4	– 29.4	+ 29.3	– 32.6	+ 32.7	– 36.5	+ 36.4	– 40.6
			78 MPH		85 MPH		93 MPH		101 MPH		108 MPH		116 MPH		124 MPH		132 MPH		139 MPH		147 MPH		155 MPH

For SI: 1 foot = 304.8 mm, 1 mile per hour = 1.609 km/h, 1 psf = 47.88 N/m^2.

Nominal Design Wind Speed (V_{asd}) converted from Ultimate Design Wind Speed per Section 1609.3.1.

1. 1.For door sizes or wind speeds between those given above the load may be interpolated, otherwise use the load associated with the lower door size.
2. 2.Table values shall be adjusted for height and exposure by multiplying by the adjustment coefficient in Table 1609.7(2). Minimum positive wind load shall be 10 psf and minimum negative wind load shall be 10 psf.
3. 3.Plus and minus signs signify pressures acting toward and away from the building surfaces.
4. 4.Negative pressures assume door has 2 feet of width in building's end zone.
5. 5.Table values include the 0.6 load reduction factor.

TABLE 1609.7(2)

ADJUSTMENT FACTOR FOR BUILDING HEIGHT AND EXPOSURE, (λ)

MEAN ROOF HEIGHT (feet)	EXPOSURE B	C	D
15	0.82	1.21	1.47
20	0.89	1.29	1.55

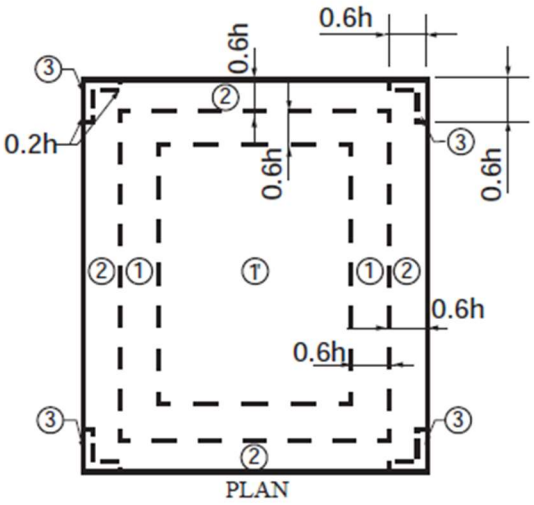
25	0.94 1.35 1.61
30	1.00 1.40 1.66
35	1.05 1.45 1.70
40	1.06 1.49 1.74
45	1.10 1.53 1.78
50	1.13 1.56 1.81
55	1.16 1.59 1.84
60	1.19 1.62 1.87

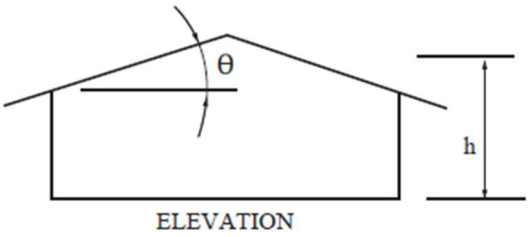
Window and door design pressure loads are transferred to the structure. Fastener installation is most critical for load transfer. Follow product approval installation requirements. All loads are transferred to the foundation. Door hardware installation is critical for design pressures since the load is on the hinges and the latch.

Flange windows mounted on furring anchored thru with masonry screws.

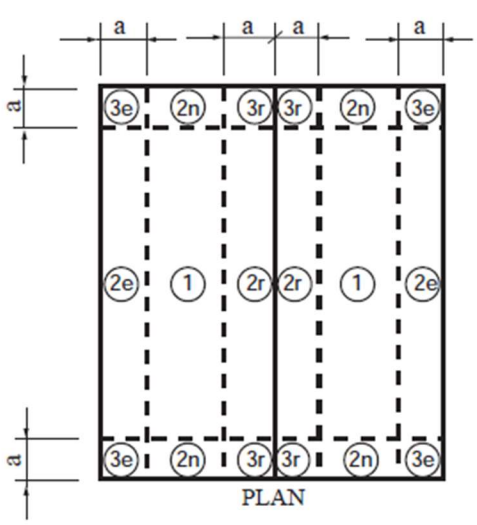
Fin windows should mount on sheathing over framing.

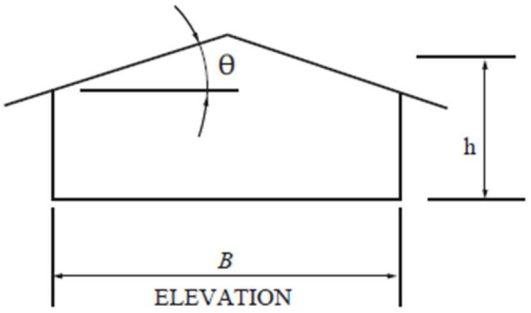
Stainless truss heads are best in a coastal area. Zinc platted fasteners corrode faster in a coastal environment.



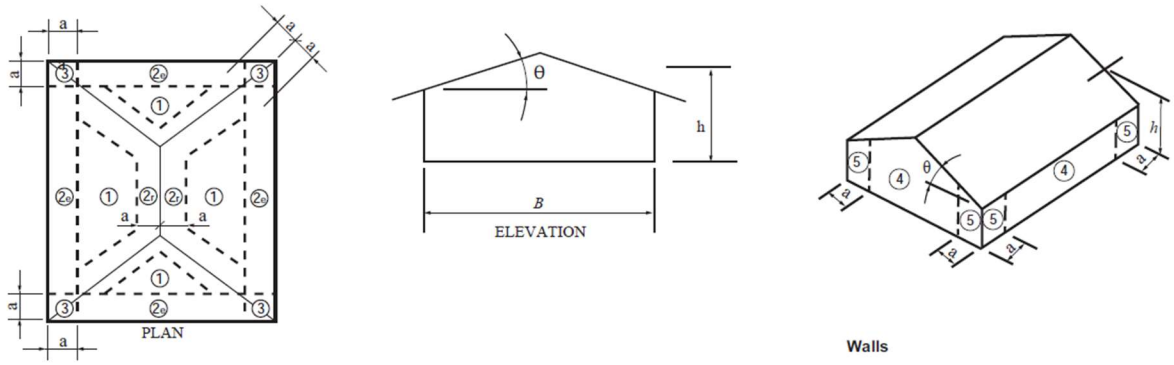


Gable and Flat Roofs $\theta \leq 7^{o}$





Gable and Flat Roofs $7^{o} < \theta \leq 45^{o}$



Hip Roofs $7° < \theta \leq 45°$

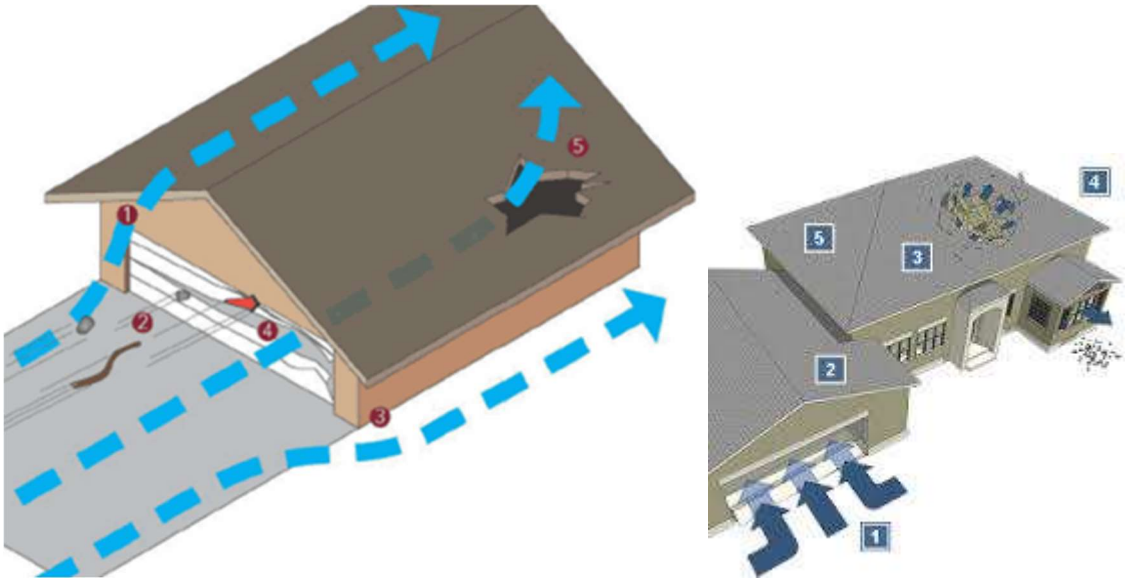
For SI: 1 foot = 304.8 mm, 1 degree = 0.0175 rad.
Note: a = 4 feet in all cases.

FIGURE R301.2(7)
COMPONENT AND CLADDING PRESSURE ZONES

Building zones and how design pressures apply to certain zones will be discussed. Building and roof edges have higher pressures.

This structure was on the north side of the 41 bridges over Charlotte Harbor. The missing second story is completely gone.

1609.1.2.3 Garage doors.
Garage door glazed opening protection for wind-borne debris shall meet the requirements of an *approved* impact-resisting standard or ANSI/DASMA 115.
1609.1.2.4.2 Impact resistant coverings shall be labeled in accordance with the provisions of Section 1709.9.



1609.1.2.4 Impact-resistant coverings.

The referenced standards for opening protection in hurricane windborne debris area are listed below with numbers so that they can be referred to more briefly later.

- Florida Building Code: TAS 201 Large and Small Missile Test Standards, TAS 202 Uniform Structural Load Standards, and TAS 203 Uniform Cyclic Pressure Test Standards. These are the Test Standards required for a Miami-Dade Product Approval. A product with a NOA (Notice of Acceptance) is approved for use in Miami-Dade and Broward counties if it meets the requirements of these test standards.
- ASTM E 1886 Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Storm Shutters Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials, and, ASTM E 1996 Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors and Storm Shutters Impacted by Windborne Debris in Hurricanes. These are the Test Standards required for Product Approval in the rest of Florida and in

International Building Code for use in Windborne Debris Regions for the US, Hawaii, and Caribbean Islands. This standard is not sufficient for opening protection devices in Miami-Dade or Broward counties.

- SBCCI Test Standard for Determining Impact Resistance From Windborne Debris SSTD-12-97 (Note: This Test Standard was accepted in Florida until December 31, 2007; but, is no longer accepted for new products. This standard by itself is not and has not been sufficient for opening protection devices in Miami-Dade or Broward counties.

1609.1.2.4.1

Impact-resistant coverings shall be tested at 1.5 times the design pressure (positive or negative) expressed in pounds per square feet as determined by Florida Building Code Section 1609 or ASCE 7, for which the specimen is to be tested. The design pressures, as determined from ASCE 7, are permitted to be multiplied by 0.6.

1609.1.2.4.2 Impact-resistant coverings.

Impact resistant coverings shall be labeled in accordance with the provisions of Section 1709.9.

1609.5 Tornado loads.

The design and construction of Risk Category III and IV buildings and other structures shall be in accordance with Chapter 32 of ASCE 7, except as modified by this code.

1609.6 Roof systems.

Roof systems shall be designed and constructed in accordance with Sections 1609.6.1 through 1609.6.3, as applicable.

1609.6.1 Roof deck.

The roof deck shall be designed to withstand the wind pressures determined in accordance with ASCE 7. Where design for tornado loads is required, the roof deck shall be designed to withstand the greater of wind pressures or tornado pressures determined in accordance with ASCE 7.

1609.6.2 Roof coverings.

Roof coverings shall comply with Section 1609.6.1.

Exception: Rigid tile roof coverings that are air permeable and installed over a roof deck complying with Section 1609.6.1 are permitted to be designed in accordance with Section 1609.6.3.

1609.6.2.1 Asphalt shingles.

Asphalt shingles installed over a roof deck complying with Section 1609.6.1 shall comply with the wind-resistance requirements of Section 1504.1.1.

1609.6.3 Rigid tile.

Wind loads on rigid tile roof coverings shall be determined in accordance with the following equation:

$$M_a = q_h K_d C_L b L L_a [1.0 - G C_p]$$

(Equation 16-18)

For SI:

$$M_a = \frac{q_h K_d C_L b L L_a [1.0 - G C_p]}{1,000}$$

where:

b = Exposed width, feet (mm) of the roof tile.

C_L = Lift coefficient. The lift coefficient for concrete and clay tile shall be 0.2 or shall be determined by test in accordance with Section 1504.2.1.

GC_p = Roof pressure coefficient for each applicable roof zone determined from Chapter 30 of ASCE 7. Roof coefficients shall not be adjusted for internal pressure.

K_d = Wind directionality factor determined from Chapter 26 of ASCE 7.

L = Length, feet (mm) of the roof tile.

L_a = Moment arm, feet (mm) from the axis of rotation to the point of uplift on the roof tile. The point of uplift shall be taken at 0.76L from the head of the tile and the middle of the exposed width. For roof tiles with nails or screws (with or without a tail clip), the axis of rotation shall be taken as the head of the tile for direct deck application or as the top edge of the batten for battened applications. For roof tiles fastened only by a nail or screw along the side of the tile, the axis of rotation shall be determined by testing. For roof tiles installed with battens and fastened only by a clip near the tail of the tile, the moment arm shall be determined about the top edge of the batten with consideration given for the point of rotation of the tiles based on straight bond or broken bond and the tile profile.

M_a = Aerodynamic uplift moment, feet-pounds (N-mm) acting to raise the tail of the tile.

q_h = Wind velocity pressure, psf (kN/m^2) determined from Section 26.10.2 of ASCE 7.

Concrete and clay roof tiles complying with the following limitations shall be designed to withstand the aerodynamic uplift moment as determined by this section.

1. 1.The roof tiles shall be either loose laid on battens, mechanically fastened, mortar set or adhesive set.
2. 2.The roof tiles shall be installed on solid sheathing that has been designed as components and cladding.
3. 3.An underlayment shall be installed in accordance with Chapter 15.
4. 4.The tile shall be single lapped interlocking with a minimum head lap of not less than 2 inches (51 mm).
5. 5.The length of the tile shall be between 1.0 and 1.75 feet (305 mm and 533 mm).
6. 6.The exposed width of the tile shall be between 0.67 and 1.25 feet (204 mm and 381 mm).
7. 7.The maximum thickness of the tail of the tile shall not exceed 1.3 inches (33 mm).
8. 8.Roof tiles using mortar set or adhesive set systems shall have at least two-thirds of the tile's area free of mortar or adhesive contact.

1609.6.3.1 Tornado loads.

Where design for tornado loads is required, tornado loads on rigid tile roof coverings shall be determined in accordance with Section

1609.6.3, replacing q_h with q_{hT} and GC_p with $KvT(GC_p)$ in Equation 16-18, where:

q_{hT} = Tornado velocity pressure, psf (kN/m) determined in accordance with Section 32.10 of ASCE 7.

K_{vT} = Tornado pressure coefficient adjustment factor for vertical winds, determined in accordance with Section 32.14 of ASCE 7.

1709.9 Impact resistant coverings.

1709.9.1 Labels.
A permanent label shall be provided by the product approval holder on all impact-resistant coverings.

1709.9.2
The following information shall be included on the labels on impact-resistant coverings:

1. Product approval holder name and address.

2. All applicable methods of approval. Methods of approval include, but are not limited to Miami-Dade NOA; Florida Building Commission, TDI Product Evaluation; ICC-ES.

3. The test standard or standards specified in Section 1609.1.2, including standards referenced within the test standards specified in Section 1609.1.2 used to demonstrate code compliance.

4. For products with a Florida product approval number or a Miami-Dade County Building and Neighborhood Compliance Department Notice of Acceptance Number (NOA), such numbers shall be included on the label.

1709.9.3 Location of label.

The location of the label on the impact-resistant covering shall be as follows:

1. Accordions: Bottom of the locking bar or center mate facing the exterior or outside.

2. Rollup: On the bottom of the hood facing the exterior or outside or on the bottom slat facing the exterior or outside.

3. Bahama Awning or Colonial Hinged: On the bottom, placed on the back of the shutter.

4. Panels: For metal and plastic panels, the label may be embossed or printed spaced not more than every three (3) lineal feet on each panel. The label shall be applied by the holder of the product approval and shall face the exterior or outside.

5. Framed products: The label shall be on the side or bottom facing the exterior or outside.

6. Labels on all other products shall face the exterior or outside.

HURRICANE-PRONE REGIONS.
Impact rated door in a second story post-firm compliant duplex. ”C” wind ZONE 145 mph design pressure

+ 55 -55pressure rated.

1709.10 Soffit.

1709.10.1 Product approval.
Manufactured soffit materials and systems shall be subject to statewide or local product approval as specified in *Florida Administrative Code* (FAC) Rule 61G-20. The net free area of the manufactured soffit material or system shall be included in the product approval submittal documents.

1709.10.2 Labels.
Individual manufactured soffit pieces shall be marked at not more than 4 feet (1.2 m) on center with a number or marking that ties the product back to the manufacturer.
1709.10.3
The following information shall be included on the manufactured soffit material packaging or on the individual manufactured soffit material or system pieces:
1. Product approval holder and/or manufacturer name and city and state of manufacturing plant.
2. Product model number or name.
3. Method of approval and approval numbers as applicable. Methods of approval include, but are not limited to: Florida Building Commission FL #; MiamiDade NOA; TDI Product Evaluation; and ICC-ES.
4. The test standard or standards specified in Chapter 14 used to

demonstrate code compliance.

5. The net free area shall be included on the packaging or label.

Load transfer of floor joists to wall diaphragm after blocking was added.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WIND-BORNE DEBRIS REGION.

1609.3.1 Wind speed conversion.

When required, the ultimate design wind speeds of Figures 1609.3(1), 1609.3(2), 1609.3(3), and 1609.3(4) shall be converted to nominal design wind speeds, V_{asd}, using Table 1609.3.1 or Equation 16-33.

TABLE 1609.3.1 WIND SPEED CONVERSIONS [a, b, c]

V_{ult}	100	110	120	130	140	150	160	170	180	190	200

V_{asd}	78	85	93	101	108	116	124	132	139	147	155

For SI: 1 mile per hour = 0.44 m/s.

a. Linear interpolation is permitted.

b. V_{asd} = nominal design wind speed applicable to methods specified in Exceptions 1 through 5 of Section 1609.1.1.

c. V_{ult} = ultimate design wind speeds determined from Figures 1609.3(1), 1609.3(2), 1609.3(3) or 1609.3(4).

1609.4 Exposure category.

For each wind direction considered, an exposure category that adequately reflects the characteristics of ground surface irregularities shall be determined for the site at which the building or structure is to be constructed. Account shall be taken of variations in ground surface roughness that arises from natural topography and vegetation as well as from constructed features.

1609.4.1 Wind directions and sectors.

For each selected wind direction at which the wind loads are to be evaluated, the exposure of the building or structure shall be determined for the two upwind sectors extending 45 degrees (0.79 rad) either side of the selected wind direction. The exposures in these two sectors shall be determined in accordance with Sections 1609.4.2 and 1609.4.3 and the exposure resulting in the highest wind loads shall be used to represent winds from that direction.

Key Terms:

Load Transfer	Debris Impact zone
Wind Load	Ultimate wind speed
Wind Mitigation	Building importance
ASCE-7	Residential Code
MWFR system	Main Code
Diaphragm	Load Connection
Load Transfer	Point Load
Strut connection	Uniform Load

Product Approval	NOA
Product installation	Missile impact Testing
Opening protection	Design Pressure
Roof Deck	Roof Covering
Roof Systems	ASCE-7
Wind load zone	Partially Enclosed
Mono sloped	Risk Category
Building Importance	NET PRESSURE COEFFICIENTS
Wind Borne Debris Zone	Design wind speed

1609 Course Time Line

Introduction ----------8 min

Wind maps (Figures 1609A, 1609B, 1609C) ----------12 Min

Determination of Wind Loads 1609.1 ----------15 Min

Understanding Design Pressures ----------10 Min

Protection of Openings 1609.1.2.4.2----------10 Min

Exposure categories 1609.4.3----------15 min

Tornado Loads 1609.5 1609.6 Roof Systems, 1609.6.1Roof Deck, Roof Coverings 1609.6.2, Asphalt Shingles 1609.6.2.1, Rigid Tile 1609.6.3 ----------15 min

Components and cladding 1609.6.4.4.1----------10 Min

Impact Resistant components 1710, 1609.1.2.4----------15Min

Wind Borne Debris Region 1609.3----------10Min

Total ----------120 min (2 Hours)

This includes question and explanations