



**A Summary of Provisions Pertaining to Wood Trusses in the Florida Building Code 2004 - Building (FBC) & Florida Building Code 2004 - Residential (FRC) (cross referenced to FBC 2001 sections)**

**Preface:** The Owner either directly or by Contract with the Building Designer and/or the Contractor shall be responsible for the design and construction of the Building Structural System in accordance with all Florida Legal Requirements and the appropriate building code. The following abbreviations are used in this summary: Florida Building Code – Building (FBC), Florida Building Code – Residential (FRC), [Florida Building Code 2001 \(FBC-01\)](#). This summary pertains to all Florida Counties. Note: Dade & Broward Counties are governed by the High Velocity Hurricane Zone (HVHZ) sections (FRC R302 to R324 and Chapter 44) (FBC Sections 1612-1626 and 2314-2330) ([FBC-01 1611-1626](#)).

**Code Implementation Date:** Senate Bill 422 revised the implementation of the FBC 2004 from July 1, 2005 to October 1, 2005. After July 1, a building may be allowed to be governed by the 2004 FBC. Other building code requirements are included in Senate Bill (SB) 422 and House Bill (HB) 835, which took effect July 1, 2005, and were made effective as of December 12, 2005, in the Florida Building Code 2005 Supplement.

**Code Scope:** The FRC (per R101.2) is limited to detached One- and Two-Family Dwellings and multiple single-family dwellings (townhouses) not more than three stories in height with a separate means of egress and their accessory structures. All other structures are subject to the FBC. Per FRC R301.2.1.1, Design Criteria, for construction in regions where the basic wind speeds from Figure R301.2(4) equal or exceed 100 miles per hour is outside of the scope of the FRC, except for concrete construction (item 4). The prescriptive requirements of the FRC for wood framing may only be used in the 90-100 mph zone on the Basic Wind Speed map. The definition of wind-borne debris region has not changed (FRC Chapter 2) (FBC 1609.2) ([FBC-01 1606.1.5](#)):

**WIND-BORNE DEBRIS REGION**

1. Areas within one mile (1.6 km) of the coastal mean high water line where the basic wind speed is 110 mph (49 m/s) or greater.
2. Areas where the basic wind speed is 120 mph (53 m/s) or greater except from the eastern border of Franklin County to the Florida-Alabama line where the region includes areas only within one mile of the coast.

**Building Structural System Design Documents:** They shall be accurate and reliable. The Owner, Building Designer, or Contractor shall provide: all structural element and truss orientations and locations; information to fully determine all truss profiles; all structural element and truss bearing conditions; the location, direction, and magnitude of all dead and live loads applicable to each structural element and truss including, but not limited to, loads attributable to: roof, floor, partition, mechanical, fire sprinkler, attic, storage, rain, and wind forces; all structural element and truss anchorage designs required to resist uplift, gravity, and lateral loads; allowable vertical and horizontal deflection criteria; proper transfer of design loads affecting the structural elements and trusses; and adequate connections between trusses and non-truss structural elements.

**I. Scope:** Construction standards or practices not covered by the FRC shall be in accordance with the provisions of FBC.

**II. ANSI/TPI 1, 2002:** The latest edition is referenced and is an integral part of both codes. (FRC R502.11.1 & R802.10.2, Chapter 43) (FBC 2303.4, Chapter 35) ([FBC-01 2301.10.4 & 2303.14.9 referencing ANSI/TPI 1-1995](#))

**III. Minimum plan review criteria** for the use of structural components shall include a floor/roof-framing plan. (FRC R101.2.1 references FBC Chapter 1) (FBC 106) ([FBC-01 104](#))

**IV. ASCE 7:** Compliance with the provisions of ASCE 7-98 is required to meet the loading requirements of the FBC/FRC. The references in FBC/FRC 2004 to ASCE 7-98 have been changed to ASCE 7-02 by the 2005 Supplement as of December 12, 2005. (see also SB 442, Section 36 & HB 835 Section 1) ([FBC-01 1601.2.2](#))

**V. Dead Load:** The actual weights of materials and constructions shall be used. Where the actual weights are not specifically known, values satisfactory to the building official may be assumed for design. (FBC 1606) (FRC R301.4) ([FBC-01 1603](#))



- Wind-borne Debris Region**  
Section 1609.1.5 & 1609.2
- 120 mph & above (ASCE 7-98)
  - 110 mph 1 mile of coast (ASCE 7-98)
  - 1 mile of coast (Exception)
- Basic Wind Speed**  
Section 1609.1.6
- 1) The values are normal design, 3-second gust, wind speeds in miles per hour (mph) at 33 feet (10 m) above ground for Exposure C Category.
  - 2) This map is accurate to the county. Local governments establish specific wind speed/wind-borne debris lines using physical landmarks such as major roads, canals, rivers, and shorelines.
  - 3) Islands and coastal areas outside the last contour shall use the last wind-speed contour of the coastal area.
  - 4) Mountainous terrain, gorges, ocean promontories, and special wind regions shall be examined for unusual wind conditions.
  - 5) Wind speeds are American Society of Civil Engineers Standard (ASCE 7-98) 50-100 year peak gusts.

**VI. Roof Live Load:** The design roof live load ( $L_r$ ) for structures within the scope of the FRC shall be a minimum of 20 psf for slopes less than 4:12, or 16 psf for all other slopes to 12:12 (FRC Table R301.6) (FBC-01 1604.6). Design per the FBC 2004 requires the use of an equation to determine design roof live load (FBC 1607.11):

Rise	Default (psf)	Factor	Design Roof Live Load (psf)
less than 4	20	1.0	20
4	20	1.2 - (0.05 x rise)	20
5	20	1.2 - (0.05 x rise)	19
6	20	1.2 - (0.05 x rise)	18
7	20	1.2 - (0.05 x rise)	17
8	20	1.2 - (0.05 x rise)	16
9	20	1.2 - (0.05 x rise)	15
10	20	1.2 - (0.05 x rise)	14
11	20	1.2 - (0.05 x rise)	13
12 or greater	20	0.6	12

**VII. Wind Load:** The following parameters are required on the Building Structural System Design Documents to design roof trusses for wind: (FBC 1603.1.4 & 1609) (FRC 301) (FBC-01 1606)

- Wind speed:** The design wind speed shall be not less than the minimum wind speed in the accompanying wind speed map. (FBC Figure 1609) [FRC Figure R301.2(4)] (FBC Figure 1606) Note that the area between two zones is to be designed to the higher wind speed or a wind speed specified within the zone (for example: a building that is sited halfway between 120 mph and 130 mph contours is to be designed for either 130 mph or 125 mph, not 120 mph). All of Florida is included in the hurricane zone (wind speed greater than 90 mph). Only portions of Florida are included in the wind-borne debris region. The exact location of wind speed lines shall be established by local ordinance. For county specific wind speed information and maps see: [http://www.dca.state.fl.us/fbc/maps/2\\_maps.htm](http://www.dca.state.fl.us/fbc/maps/2_maps.htm). Warning: Check local ordinances for the actual wind for a given site.
- Windborne Debris Zone (WDZ):** This is the area within one mile of the coastal mean high water line where the basic wind speed is 110 mph or greater (Wakulla, Jefferson, Taylor, Levy, Citrus, and Hernando counties) or seaward of the 120 mph line on the ASCE 7 wind speed map, except from the eastern border of Franklin County to the Florida-Alabama line where the region includes areas only within one mile of the coast, (Franklin, Gulf, Bay, Walton, Okaloosa, Santa Rosa, and Escambia counties). Buildings in the WDZ, outside the HVHZ, must be protected from wind damage using only certified products (design as an Enclosed Building). Buildings in the WDZ, outside the HVHZ, **may not** be designed to withstand internal pressurization by the wind (design as a Partially Enclosed Building).
- Enclosure Classification:** Enclosed, Open and Partially Enclosed Building classification. Specification of Enclosed or Partially Enclosed will affect the cost of the structural components and installation. Structural Components designed for Partially Enclosed Buildings will be more stressed, perhaps more costly, and require stronger tie-downs than structural components designed for Enclosed or Open Buildings. (FBC 1609.2) (FRC assumes Enclosed) (FBC-01 1606.1.5). SB 422 and HB 835 mandate protection of buildings in the WDZ (outside the HVHZ) using design as Enclosed structures.
- Exposure Category:** Exposure Category B shall be used except in coastal building zone where Exposure Category C is used (FBC 1609.4) (FRC R301.2.1.4) (FBC-01 1606.1.8) (*Excerpted from Florida Building Code 2004*):
  - Exposure B.** Urban and suburban areas, wooded areas or other terrain with numerous closely spaced obstructions having the size of single-family dwellings or larger. Exposure B shall be assumed unless the site meets the definition of another type of exposure.
  - Exposure C.** Means, except in the high-velocity hurricane zone, that area which lies within 1,500 feet (46 m) of the coastal construction control line, or within 1,500 feet (46 m) of the mean high tide line, whichever is less. On barrier islands, exposure category C shall be applicable in the coastal building zone set forth in Section 161.55(4), Florida statutes.
- Building Occupancy:** The Building Importance Factor for Wind ( $I_w$ ) is based upon the Building Occupancy Category. (FBC Table 1604.5) (FRC assumes Category II) (FBC-01 1606):
  - Category I - Low Danger to Humans,  $I_w$  is 0.87;
  - Category II - All buildings except those in categories I, III, IV (Most Residential buildings are Category II),  $I_w$  is 1.0;
  - Category III - 300 or more people in one area, schools with an occupant load greater than 250,  $I_w$  is 1.15;
  - Category IV - Essential Facilities, Hospitals, Fire Stations, Hurricane Shelters,  $I_w$  is 1.15.
  - In hurricane prone zones with  $V > 100$  mph,  $I_w$  is 0.77.
- Mean Roof Height:** the height to the roof eave plus the average height from the eave to the highest point of the roof. When the slope is less than or equal to 10 degrees, the mean roof height is equal to the roof eave height.

**VIII. Bottom Chord Live Load:** Roof truss bottom chord live loads shall be designed per the interpretation of the FBC in the code jurisdiction where the building is sited: (FBC Table 1607.1) (FRC Table R301.5) (see also the 2004 Supplement to IBC/IRC) (FBC-01 1604.1)

- Attics without storage (either):

- a) 10 psf construction load – uniform across bottom chord and concurrent with controlling roof live load
- b) 10 psf construction load – uniform across bottom chord and non-concurrent with controlling roof live load

2. Attics with storage space (either):

- a) 20 psf storage load – uniform across bottom chord and concurrent with controlling roof live load
- b) 20 psf storage load – applied to those portions of the bottom chord of not less than two adjacent trusses with the same web configuration containing a rectangle 42 inches (1067 mm) high or greater by 2 feet (610 mm) wide or greater, located within the plane of the truss. The rectangle shall fit between the top of the bottom chord and the bottom of any other truss member, provided that each of the following criteria is met:
  - i. The attic area is accessible by a pull-down stairway or framed opening in accordance with Section 807.1; and
  - ii. The truss shall have a bottom chord pitch less than 2:12

3. Attics with sleeping space: Attic spaces served by a fixed stair shall be designed to support the minimum live load specified for sleeping rooms (30 psf).

**IX. Deflection:** (FBC 1604.3.1 & Table 1604.3) (FRC R301.7 & Table R301.7) (FBC-01 1610) (ANSI/TPI 1-02 Section 7.5)

- ♦ Floor applications: Floor trusses shall be designed with deflection limits that do not exceed L/360 for live load and L/240 for total load deflection. Certain floor coverings require more restrictive deflection criteria.
- ♦ Roof applications: Roof trusses shall be designed with deflection limits that do not exceed L/240 for live load and L/180 for total load deflection.

**X. Truss Placement Diagrams:** Florida Board of Professional Engineer's Rule Chapter 61G15-31 Responsibility Rules Of Professional Engineers Concerning The Design Of Structures (effective May 1, 2003). 61G15-31.002 states that drawings prepared solely to serve as a guide for fabrication and installation and require no engineering input, are not required to be signed and sealed by a professional engineer. 61G15-31.003 (*Design of Structures Utilizing Prefabricated Wood Trusses*), details the specific engineering requirements regarding structures designed using wood components. It allows the sealing of index sheets and defines the roles of the Building Designer (Structural Engineer of Record) and the Truss Designer (delegated engineer). SB 422, Section 10 states the following, "A truss-placement plan is not required to be signed and sealed by an engineer or architect unless prepared by an engineer or architect or specifically required by the Florida Building Code."

## HVHZ specific provisions:

Within Broward and Miami-Dade counties the provisions of FBC Sections 1612-1626 and 2314-2330 or FRC Chapter 44 shall be used.

1. **Wind speed:** Miami-Dade is 146 mph, Broward is 140 mph (FBC 1620.2)
2. **Enclosure Classification:** Buildings in the HVHZ and the WZ may be designed as Enclosed, Partially Enclosed or Open (FBC 1609.1.4.1). Unlike the rest of the state, designing for internal pressurization is allowed.
3. **Exposure Classification:** Exposure C (FBC 1620.3)
3. **Load duration factor for wind** is 1.33 (FBC 2317.2, 2319.17.2.1.3 and 2319.17.2.1.5)
4. **Roof Live Load:** Not considered to act simultaneous with wind load (FBC 1620.4). Minimum Loads (FBC 1616 & 1619) (2319.17.2.1.3 and 2319.17.2.1.5):
  - a) Pitched roofs: 45 psf total load (20 psf TCLL + 15 psf TCDL + 0 psf BCLL + 10 psf BCDL)
  - b) Flat roofs: 55 psf total load (30 psf TCLL + 15 psf TCDL + 0 psf BCLL + 10 psf BCDL)
5. **Concentrated Loads on Trusses** (FBC 1615.2.1) considered on any single panel point of the lower chord of roof trusses along with dead load, but not simultaneously with uniform live load:
  - a) Over manufacturing, commercial storage and warehousing and commercial garages – 2000 lb
  - b) For all other occupancies – 200 lb
6. **Truss Material:**
  - a) Chords shall be No. 2 or Better. Webs shall be No. 3 or Better (FBC 2319.17.2.2.2)
  - b) Nominal 2x4 minimum (FBC 2319.17.2.2.5)
  - c) Moisture content not less than 19% (FBC 2319.17.2.2.6)
  - d) Plates not less than 20 gage with Product Approval (FBC 2319.17.2.2.7)
7. **Truss Marking:** Top chords of flat trusses are to be marked. (FBC 2319.17.2.1.1, item 7)
8. **Gable End Trusses:** Gable end trusses are permitted in FBC 2319.17.2.1.6 as allowed per FBC 2318.1.8.2. Where gable end trusses are permitted in this code, they shall be designed for a minimum live load of 30 psf (1436 Pa) and a minimum dead load of 15 psf (718 Pa) on the top chord.
9. **Girder Truss Assembly:** Multiple member girder trusses shall be predrilled at the truss plant for connection bolts only. Hanger bolt holes shall be drilled on-site in the locations shown on the Truss Design Drawing. (FBC 2319.17.2.3.3)
10. **Truss Installation:** For trusses having an overall length of the bottom chord in excess of 35 feet (10.7 m) or 6 feet (1829 mm) overall height, erection shall be supervised by either a registered professional engineer or registered architect retained by the contractor. A retainer letter from the registered professional engineer or registered architect shall be submitted along with the shop drawings as part of the permit document. (FBC 2319.17.2.4.2)

Florida Wind Speeds by county (from maps, verify with local ordinances):

Jurisdiction	Wind Speed Range	WDZ	What else?
Alachua	110/100		
Baker	100/90		
Bay	110/100	1 mile exception	
Bradford	110/100		
Brevard	130/120	120 & above	
Broward (HVHZ)	130	120 & above	
Calhoun	110/100		
Charlotte	130/120	120 & above	
Citrus	120/110	110 mph 1 mile of coast	
Clay	110/100		
Collier	137/114	120 & above	
Columbia	110/100		
DeSoto	130/110		
Dixie	120/110	110 mph 1 mile of coast	
Duval	120/105	120 & above	
Escambia	140/120	1 mile exception	Checked wind speed
Flagler	120/110	120 & above	
Franklin	130/120	1 mile exception	
Gadsden	110		
Gilchrist	120/100		
Glades	120/110		
Gulf	140	1 mile exception	
Hamilton	110/100		
Hardee	110/100		
Hendry	110		
Hernando	120/110	110 mph 1 mile of coast	
Highlands	120/100		
Hillsborough	120+/100	120 & above	
Holmes	120/110		
Indian River	140/120	120 & above	
Jackson	110/100		
Jefferson	120/110	110 mph 1 mile of coast	
Lafayette	110+/100		
Lake	110/100		
Lee	130/120	120 & above	
Leon	110		
Levy	120/100	110 mph 1 mile of coast 120 & above	
Liberty	120/100		
Madison	110		
Manatee	140/100	120 & above	
Marion	110/100		
Martin	140/130	120 & above	
Miami-Dade (HVHZ)	146	120 & above	
Monroe	150	120 & above	
Nassau	120/100	120 & above	
Okaloosa	140/120	1 mile exception	
Okeechobee	120		
Orange	120/110		
Osceola	120/100		
Palm Beach	140/120	120 & above	140 mph, except Belle Glade
Pasco	130/100	120 & above	
Pinellas	130/123	120 & above	
Polk	110		
Putnam	110/100		
Santa Rosa	130/120	1 mile exception	
Sarasota	130	120 & above	
Seminole	120		
St. Johns	130/100	120 & above	
St. Lucie	140/120	120 & above	130 mph west of the St Lucie River & 140 mph east
Sumter	110/100		
Suwannee	110		
Taylor	120/110	110 mph 1 mile of coast 120 & above	
Union	100		
Volusia	120/110	120 & above	
Wakulla	120/110	110 mph 1 mile of coast	
Walton	130/115	1 mile exception	
Washington	120/110		