

Codes, Standards, and Regulations



Codes, standards, and regulations are adopted and enforced to regulate the construction of buildings. In Florida, the Standard Building Code (SBC, published by Southern Building Code Congress International, Inc., [SBCCI] with local amendments) and the South Florida Building Code (SFBC) were used to regulate construction in Florida until early 2002.

By March 2002, the 2001 Edition of the Florida Building Code (FBC) had been adopted statewide. Currently, Florida is moving to adopt the International Building Code (IBC) and the International Residential Code (IRC) with amendments that retain the more stringent requirements of the 2001 FBC. This new code will be called the 2004 Edition of the Florida Building Code. In December 2004, the Florida Building Commission completed the 2004 Edition and will adopt the new code by administrative rule on July 1, 2005. Additional state and Federal standards govern the design and construction of other buildings and structures, such as manufactured housing, and these regulations are also discussed herein.

2.1 The Building Codes

The FBC is administered by the Florida Building Commission and governs the design and construction of residential and non-residential (commercial, industrial, critical/essential, etc.) buildings in Florida. The 2001 FBC (effective in March 2002) is the applicable building code for the State of Florida. Charlotte, Lee, and De Soto Counties experienced the heaviest damage during Hurricane Charley, with damaged buildings also observed in Hardee and Osceola Counties. Prior to the adoption of the 2001 FBC, these counties used the 1997 Edition of the SBC. It is important to note that the majority of the existing buildings and structures in these counties were built under the SBC.

Both the SBC and the 2001 FBC specify higher wind speeds for areas that are closer to the ocean or gulf, and lower wind speeds for the inland areas. The methodology required for calculating wind loads in the FBC are those prescribed in Chapter 6 of ASCE 7 (with exceptions). These exceptions include the SBCCI document SSTD-10, *Standard for Hurricane Resistant Construction*, as well as other wood and masonry association prescriptive design guides that may be used for residential construction when specific criteria in Section 1606.1.8 of the FBC are met. The acceptance of ASCE 7-98 as the methodology for calculating design wind pressures was an important step for the Florida Building Commission. Using ASCE 7 for determination of wind loads ensures that designers are using current methodology in wind load analysis to calculate wind loads. Design guides and standards, such as SBCCI's SSTD-10, *Standard for Hurricane Resistant Construction*, are currently being updated and will also be based on the methodologies of ASCE 7.

Furthermore, the 2001 (and recently completed 2004) FBC instituted improved design requirements for components and cladding (such as roof coverings), and for debris impact criteria that were not previously required by the SBC. The combination of the wind load determination process of ASCE 7, the new requirements for components and cladding, and the debris impact criteria for glazing systems provided immediate mitigation successes during Hurricane Charley. Most newer homes and commercial buildings designed and constructed to the 2001 FBC were observed to have performed well and sustained only minimal damage during this hurricane event. These results are in contrast to the variety of damages observed in the older building stock that often varied from roof covering and cladding damage, to roof structural failures, to partial structural collapse of the primary load-bearing system.

2.1.1 Comparing Design Wind Speeds

When comparing the SBC, the FBC, and ASCE 7 in hurricane-prone regions, there are three notable differences that have evolved in these codes and standards that will affect the performance of buildings. These differences are:

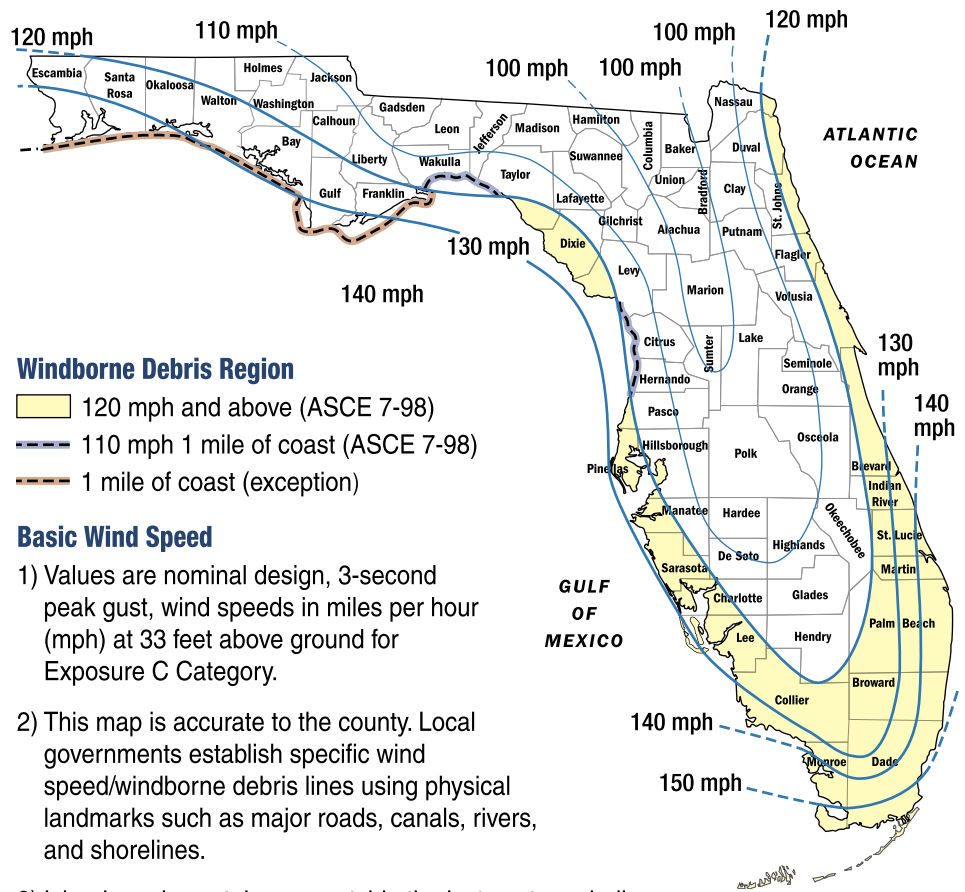
- The design wind speed (and the averaging time of the wind speed)
- How and where pressures are calculated on a building
- Requirements for debris impact protection

Looking at the design wind speed first, current codes and standards, such as the FBC and ASCE 7, standardized the wind speed averaging time as the 3-second peak gust. The wind speed map from the 2001 FBC is presented in Figure 2-1. This is different than the fastest-mile wind speed measure that was previously used by the SBC and ASCE 7. It is also different than the wind speed averaging time of 1-minute used in the Saffir-Simpson Hurricane Scale presented in Chapter 1.

As a result, comparing wind speeds from different codes or from NWS hurricane forecast advisories can be confusing and can lead to improper classifications of wind speeds and wind-related damage. When designing for high winds, it is important to ensure that the appropriate wind speed for the area has been selected and the proper methodology from the code has been identified. When this is not done, the building may be designed for an inappropriate design wind speed that does not represent the risk at the site (i.e., a design wind speed that is too low). Table 2-1 presents the design wind speeds (in 3-second peak gusts) for the counties heavily impacted by Hurricane Charley for three different codes.

Figure 2-1. Wind speed and windborne debris region map

(2001 FBC)



Windborne Debris Region

- 120 mph and above (ASCE 7-98)
- 110 mph 1 mile of coast (ASCE 7-98)
- 1 mile of coast (exception)

Basic Wind Speed

- 1) Values are nominal design, 3-second peak gust, wind speeds in miles per hour (mph) at 33 feet above ground for Exposure C Category.
- 2) This map is accurate to the county. Local governments establish specific wind speed/windborne 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 50 – 100-year peak gusts (ASCE 7-98).

Table 2-1. Basic Design 3-Second Peak Gust Wind Speeds (Ranges for Each County)

County	Standard Building Code 1979 Edition*	Standard Building Code 1997 Edition*	Florida Building Code 2001 Edition and ASCE 7-98
Charlotte	118-128 mph	118-122 mph	114-130 mph
Lee	118-128 mph	118-125 mph	117-130 mph
De Soto	118 mph	118 mph	108-120 mph

Where a range is given; the lower values correspond to the edge of the county farthest from the coast and the higher values correspond to the coastal value or the edge of the county closest to the coast.

The wind speeds shown in Table 2-1 are the nominal design, 3-second peak gust wind speeds at 33 feet above ground for Exposure C Category (open exposure). The SBC used fastest-mile wind speeds; the 2001 FBC uses a 3-second peak gust wind speed. To facilitate the comparison between the two codes, fastest-mile wind speeds provided in the older editions of the SBC Code were converted into 3-second peak gust wind speeds to compare with the FBC.

2.1.2 Comparing Calculated Wind Pressures (Old vs. New Code Methods)

A general comparison of the wind design requirements of these codes for a few select buildings was made to evaluate the effects of the change in the building code as it relates to the wind loads. A summary of the building codes comparison is presented herein.

In order to calculate the wind pressures acting on a particular structure or building components as a result of the design wind speed, various factors are specified in the different codes that play an important role in establishing the design wind pressures. These factors affect how the wind speed is adjusted for conditions at the site and how the wind is affected by the shape of the building. Some of the factors that affect the wind at the site are the importance factor (I) and Exposure Category (see text box above). The importance factor is used to increase the recurrence interval of the design wind; as a result, calculated wind pressures may increase or decrease if buildings are assigned an importance factor other than 1.0. Factors that consider the shape of the building are also used. These factors, often called pressure coefficients, are assigned to different surfaces of the building (e.g., windward or leeward side) and affect the wind pressures calculated for these surfaces. Typically, different coefficients are used on the different building surfaces and are dependent on the direction of the wind. These coefficients are then used when calculating wind pressures that put forces on the main structural system of a building (main wind force resisting system [MWFRS]) and on roof coverings, awnings, windows, and doors (components and cladding [C&C] systems).

Considering the information provided in these codes, a limited comparison of the design wind loads was performed for a typical single-family residence located in the center of Port Charlotte (Exposure B) and a critical/essential facility (e.g., a small one- and two-story fire and police station) also located in the center of Port Charlotte (Exposure B). Tables 2-2 and 2-3 are summaries of the comparisons, respectively.



Exposure is the term used in the Florida Building Code

and ASCE 7 to define the roughness of the ground surface around a particular building site. Selection of the correct Exposure Category is an important step with the wind load determination process that can alter design wind pressures by more than 15 percent across the building. See Section 1606.1.8 of the Florida Building Code or Chapter 6 of ASCE 7 for definitions of the Exposure Categories.

These tables illustrate how the design wind speed and design wind pressure calculations have changed over the past 30 years as the wind/building interaction has become better understood.

The comparisons indicate that the buildings designed and constructed in accordance with the wind provisions of the 2001 FBC should sustain less damage than the buildings constructed in accordance with the SBC. The ability of the buildings to resist wind loads and resist damage is further improved in new buildings by the stricter components and cladding design requirements now specified in the 2001 FBC. Additional improvements will occur with the implementation of the 2004 FBC.

Table 2-2. Typical Single-Family Residence in Port Charlotte

Description	Standard Building Code 1979 Edition ^{1,2,3}	Standard Building Code 1997 Edition ^{1,2,3}	Florida Building Code 2001 Edition, also ASCE 7-98 ^{1,2}	Percent Increase 1979 SBC to 2001 FBC	Percent Increase 1997 SBC to 2001 FBC
Basic wind design speed	105 mph	100 mph	125 mph		
Equivalent wind speed (3-second peak gust)	125 mph	120 mph	125 mph		
Wind design pressures on exterior walls					
As main frame edge	18 / -16 psf	22 / -19 psf	24 / -21 psf	33% / 31%	9% / 10%
middle net edge	18 / -16 psf	16 / -14 psf	17 / -15 psf	-5% / -6%	6% / 7%
net middle	30 psf	34 psf	34 psf	13%	0%
	30 psf	22 psf	23 psf	-23%	5%
As C & C middle corner	25 / -25 psf	27 / -27 psf	28 / -31 psf	12% / 24%	4% / 15%
	25 / -25 psf	27 / -31 psf	28 / -38 psf	12% / 52%	4% / 23%
Wind design pressures on roof (4 in 12 slope)					
As main frame windward edge	-23 psf	-28 psf	-30 psf	30%	7%
leeward edge	-17 psf	-20 psf	-21 psf	24%	5%
windward middle	-23 psf	-20 psf	-21 psf	-9%	5%
leeward middle	-17 psf	-15 psf	-16 psf	-6%	7%
As C & C middle corner	-21 psf	16 / -24 psf	16 / -26 psf	-- / 24%	0% / 8%
	-21 psf	16 / -55 psf	16 / -54 psf	-- / 162%	0% / -2%

Table 2-3. Typical Critical/Essential Facility in Port Charlotte

Description	Standard Building Code 1979 Edition ^{1,2,3}	Standard Building Code 1997 Edition ^{1,2,3}	Florida Building Code 2001 Edition, also ASCE 7-98 ^{1,2}	Percent Increase 1979 SBC to 2001 FBC	Percent Increase 1997 SBC to 2001 FBC
Basic wind design speed	105 mph	100 mph	125 mph		
Equivalent wind speed (3-second peak gust)	125 mph	120 mph	125 mph		
Wind design pressures on exterior walls					
As main frame edge	18 / -16 psf	21 / -16 psf	21 / -17 psf	17% / 6%	0% / 6%
middle	18 / -16 psf	15 / -13 psf	16 / -13 psf	-11% / -19%	7% / 0%
net edge	30 psf	28 psf	29 psf	-3%	4%
net middle	30 psf	19 psf	19 psf	-37%	0%
As C & C middle	25 / -25 psf	31 / -31 psf	32 / -35 psf	28% / 40%	3% / 13%
corner	25 / -25 psf	31 / -35 psf	32 / -43 psf	28% / 72%	3% / 23%
Wind design pressures on roof (4 in 12 slope)					
As main frame windward edge	-23 psf	-33 psf	-34 psf	48%	3%
leeward edge	-17 psf	-23 psf	-24 psf	41%	4%
windward middle	-23 psf	-19 psf	-19 psf	-17%	0%
leeward middle	-17 psf	-15 psf	-15 psf	-12%	0%
As C & C middle	-21 psf	12 / -31 psf	13 / -32 psf	-- / 52%	8% / 3%
corner	-21 psf	12 / -68 psf	13 / -82 psf	-- / 290%	8% / 21%

Notes for Tables 2-2 and 2-3:

- 1 The pressure calculations under each code for both main frame and components and cladding (C&C) were calculated using building design coefficients in wind zones that provide the maximum wind pressure for any area on that building surface.
- 2 Positive value pressures indicate pressures acting inward toward building surfaces. Negative value pressures indicate pressures acting outward from building surfaces.
- 3 Pressures calculated from the 1979 and 1997 SBC were calculated using their appropriate fastest-mile wind speed and design methods in the code that was in effect at the time. The 3-second peak gust wind speed is shown for comparative purposes only and was not used in the calculation of the design wind pressures.

mph = miles per hour

psf = pounds per square foot

net edge = the net pressure contributing to the shear force for the wall edge strips; equal to the sum of the external pressures from edge wall Zones 1E and 4E (see ASCE 7 Figure 6-4; internal pressures cancel).

net middle = the net pressure contributing to the shear force for the interior wall zone; equal to the sum of the external pressures from wall Zones 1 and 4 (see ASCE Figure 6-4; internal pressures cancel).

2.1.3 Comparing Debris Impact Criteria

The FBC instituted debris impact criteria requirements statewide and associated these requirements with design wind speeds across the state. Prior to the FBC, only the South Florida Building Code (with county provisions) identified debris impact criteria affecting the design of buildings for portions of Florida. Examples were the county provisions adopted by Miami-Dade and Broward Counties. The SBC, enforced in the portions of the state not using the South Florida Building Code, did not have debris impact protection requirements. Section 1606.1.5 of the 2001 FBC defines the windborne debris impact region as (refer also to Figure 2-1):

- Areas within 1 mile of the coastal mean high water line where the basic wind speed is 110 mph or greater.
- Areas where the basic wind speed is 120 mph or greater except from the eastern border of Franklin County to the Florida-Alabama line where the region includes areas only within 1 mile of the coast. Note: A detailed discussion of this exception and the coastal damage caused by Hurricane Ivan is presented in FEMA 489, *Hurricane Ivan in Florida and Alabama*.

For the above regions, the FBC provided clear guidance on design considerations in the windborne debris regions. Buildings in the windborne debris region were required to protect glazed openings (windows and doors) to ensure that the building envelope would remain “enclosed.” To achieve the criteria of “enclosed building” shutters, laminated glass or solid doors were required to be installed. Protection measures were required to resist large or small debris (missiles), depending upon their height on the exterior of a building. An exemption was provided for residential construction in the Florida statutes permitting unprotected glazing if the building was designed and constructed to account for internal pressures (Section 2.2). If windows and doors are not protected, they may be damaged such that they allow wind into a building or structure. When this occurs, the building typically experiences higher wind loads. The code identifies a methodology to account for this by designing for the effect of the wind entering the building through the openings. This process designs for internal pressures within the building and typically results in structures that have the ability to resist higher wind loads, but the structural improvements do not improve the ability of the building to keep out the wind and water associated with the storm. Additional guidance on the windborne debris region and the debris impact criteria is provided in FBC Section 1606.1.4. Windborne debris criteria were added to the 1995 edition of ASCE. Those criteria have been modified in subsequent editions.

2.1.4 High-Wind Elements of the Code

The 2001 FBC has special and stringent requirements for “High Velocity Hurricane Zones” (HVHZs). Sections 1611-1616 in the FBC define wind and debris requirements of HVHZs. Only Miami-Dade and Broward Counties are included in the HVHZ areas.

The HVHZs affect the design and construction of buildings by requiring building elements other than just the structural system to be designed for the code specified wind speeds. In the HVHZs, the design of specific building components, attachments, and equipment must also be designed for the code specified wind speed. The difference in design pressure is often substantial and results in much stronger main structure and components design values for buildings. Many other requirements (e.g., mandatory inspections, Exposure Category, allowable stress increase, requirements for windborne debris, inspections during construction, product approval requirements, etc.) make HVHZ design and construction substantially stronger than in other areas. Buildings built according to HVHZ requirements have greater capacity to withstand hurricanes and provide additional safety for life and property protection.

As shown in Tables 2-2 and 2-3, the conversion from the 1997 SBC Code to the 2001 FBC has increased the design loads for buildings in the non-HVHZs. However, hurricane events in August and September 2004 have shown that, with respect to building mainframes, C&C, and rooftop equipment issues, many areas of Florida may benefit from incorporating some of the HVHZ requirements into the non-HVHZ areas. Observations related to specific examples of damage observed and the sections of the HVHZ criteria that would help resist the types of damage noted by the MAT are presented in Chapters 5, 7, and 8.

2.2 Florida Statutes Affecting Building Design

In addition to the FBC, there are legislative statutes in Florida that affect design and construction. These statutes are found in Ch. 553.71 and Ch. 2000-141 of the *Laws of Florida* and are presented herein to assist in understanding the design and construction process in Florida. Discussions regarding the use of these statutes as part of the design and construction process are presented in Chapters 7 and 8.

The following statutes address wind loads and windborne debris protection. The Florida Legislature mandated several items. The first mandate relates to the wind load provisions of ASCE 7-98:

“(3) For areas of the state not within the high velocity hurricane zone, the commission shall adopt, pursuant to s. 553.73, Florida Statutes, the wind protection requirements of the American Society of Civil Engineers, Standard 7, 1998 edition as implemented by the International Building Code, 2000 edition, and as modified by the commission in its February 15, 2000, adoption of the Florida Building Code for rule adoption by reference in Rule 9B-3.047, Florida Administrative Code.” [Section 109(3), Ch. 2000-141, *Laws of Florida*]

Continuing with (3) above, the Florida statute identifies a modification to the windborne debris regions of ASCE 7-98 as follows:

“(3) ...However, from the eastern border of Franklin County to the Florida-Alabama line, only land within 1 mile of the coast shall be subject to the windborne-debris requirements adopted by the commission. 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. Buildings constructed in the windborne debris region must be either designed for internal pressures that may result inside a building when a window or door is broken or a hole is created in its walls or roof by large debris, or be designed with protected openings. Except in the high velocity hurricane zone, local governments may not prohibit the option of designing buildings to resist internal pressures.” [Section 109(3), Ch. 2000-141, *Laws of Florida*]

Lastly, the Florida statute modified the definition of Exposure C as follows:

“(10) ‘Exposure category C’ means, except in the high velocity hurricane zone, that area which lies within 1,500 feet of the coastal

construction control line, or within 1,500 feet 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 s. 161.55(5).” [Ch. 553.71(10), F.S.]

2.3 HUD Manufactured Housing Design Standards

The design and construction of manufactured homes have been governed at the Federal level by HUD since the National Manufactured Housing and Construction Safety Standards Act was passed in 1974.

Beginning in 1976, the Manufactured Home Construction and Safety Standards, 24 Code of Federal Regulations (CFR) 3280, established the minimum requirements for the construction, design, and performance of a manufactured home. These standards are preemptive over any state or local standard for home construction, provided that the HUD standards cover that aspect of performance of the home. The HUD standards cover body and frame requirements; thermal protection; plumbing; electrical; heating, ventilation, and air conditioning (HVAC); fire safety; and other performance aspects of the home.

Currently, the HUD standards define a manufactured home as a dwelling unit, transportable in one or more sections, that, when erected on site, is of at least 320 square feet in size, with a permanent chassis to assure the initial and continued transportability of the home. In the traveling mode, a manufactured home is 8 feet or more in width or 40 feet or more in length.

In August 1992, when Hurricane Andrew hit southern Florida, over one third of all site-built homes were substantially damaged and almost all manufactured homes were destroyed. As a direct consequence, HUD developed improved wind-resistance requirements for the hurricane-prone coastal areas of the United States. Contained in Final Rule 59 FR 2456 (1994), these changes included defining three separate wind zones – Zone I, Zone II, and Zone III (Figure 2-2).

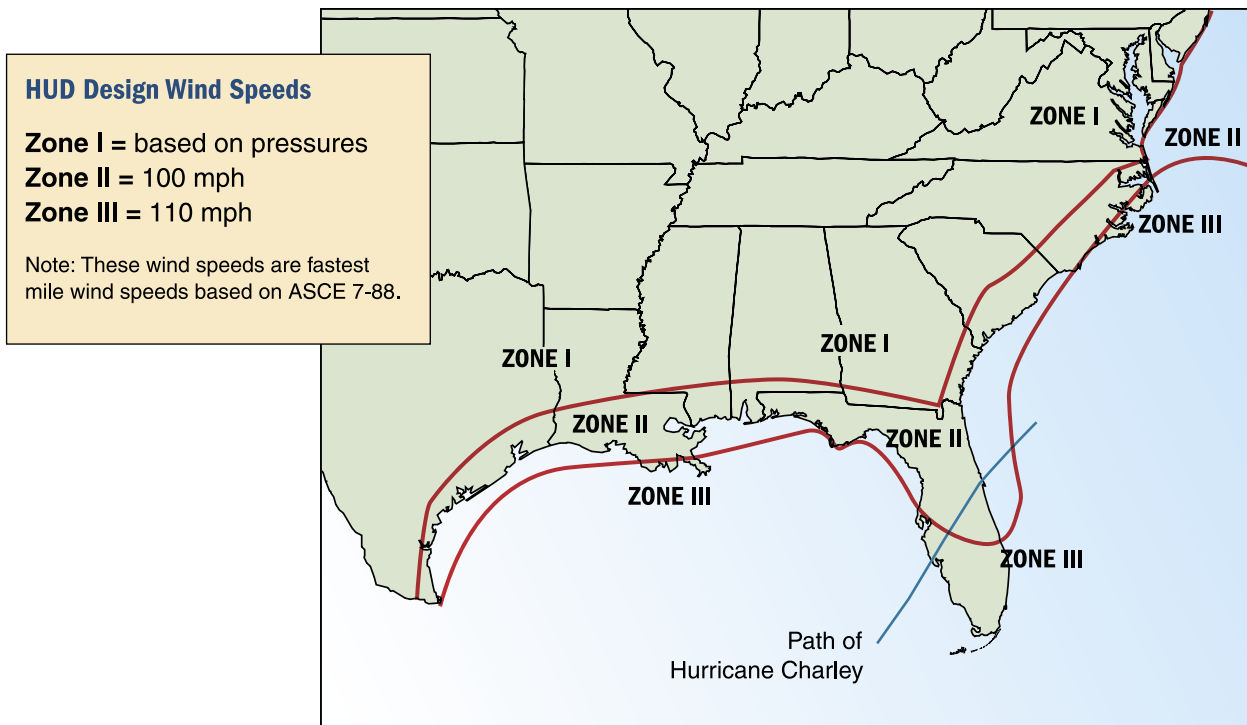


Figure 2-2. Basic wind zone map for the design of manufactured homes

For wind Zones II and III, this rule also designates higher wind loads. Specifically, the updated HUD standard requires that the manufactured home, each of its wind-resisting parts, and its C&C materials be designed by a professional engineer or architect to resist either the design wind loads for Exposure C specified in American National Standards Institute (ANSI)/ASCE 7-88, *Minimum Design Loads for Buildings and Other Structures*, for a 50-year recurrence interval; or a fastest-mile design wind speed of 100 mph, as specified for pressures in the Table of Design Wind Pressures (24 CFR 3280.305).

In addition, the new rule requires that each manufactured home have a support and anchoring or foundation system that, when properly designed and installed, will resist overturning and lateral movement (sliding) of the manufactured home, as imposed by the respective design loads.

Federal, state, and local governments and the manufactured home industry strive to institute construction practices and regulations to increase the safety of manufactured homes in natural hazards

environments. The following list summarizes some of the recent regulations that have been passed or are in the process of being developed to improve the resistance of manufactured homes to natural hazards:

- Section 605 of the National Manufactured Housing Construction and Safety Standards Act of 1974 (42 U.S.C. 5401) requires the Secretary of HUD to establish and implement a national manufactured housing installation program by December 27, 2005. This installation program must include: (1) installation standards, (2) the training and licensing of manufactured home installers, and (3) the inspection of manufactured home installations. The HUD program will be implemented in any state that does not have its own program, which includes all three of the previous components, established by state law. Further, to be exempted, a state must have adopted standards that equal or exceed the protection provided by HUD's national manufactured housing installation program. More information on the development of this new program can be found at <http://www.hudclips.org>.
- The National Fire Protection Association currently maintains three documents on the subject of manufactured housing: (1) NFPA 501, *Standard on Manufactured Housing*, a consensus document on the design and construction of manufactured homes that provides a source for revisions to the Federal regulations (24 CFR 3280); (2) NFPA 501A, *Standard for Fire Safety Criteria for Manufactured Home Installations, Sites and Communities*; and (3) NFPA 225, *Model Manufactured Home Installation Standard*, a consensus document that governs the installation of manufactured homes. Both the 2005 editions of NFPA 501 and NFPA 225 have wind-related requirements based upon ASCE 7-02.
- The HUD program only requires that Zone III units be constructed to receive high-wind shutters to protect openings; there is no requirement to provide window protection in areas where other one-and two-family dwellings are constructed.

2.4 Florida Manufactured Housing Installation Standards

Although the HUD Manufactured Home Construction and Safety Standards, 24 CFR 3280, cover the design and construction of the home itself, it is the local jurisdiction that regulates the installation of the home. In the State of Florida, the Department of Highway Safety and Motor Vehicles has jurisdiction over the installation of manufactured housing. Per the Division of Motor Vehicles,

Chapter 15C of the Rules and Regulations of the Florida Administrative Code addresses the requirements for installation, setup, and anchoring the foundation for manufactured homes.

The rules and regulations governing the Bureau of Mobile Home and Recreational Vehicle Construction are contained in Chapter 15C of the Rules and Regulations of the Florida Administrative Code. Some of the code's basic requirements include:

- Before being shipped from the manufacturing plant, all manufactured homes produced for sale in Florida are required to be inspected at the manufacturing plant and cannot be shipped until an appropriate Florida Code Seal has been affixed and validated by the inspector.
- Manufacturers are required to furnish complete printed setup, blocking, and anchoring instructions with each unit.
- The installer, dealer, or manufacturer is required to verify that the necessary permits have been obtained from the local building department.
- Setup of a new manufactured home must be in compliance with the installation instructions that are provided by the manufacturer.
- All work performed at the setup is required to be inspected by the local building official. The Certificate of Occupancy is issued by the local building department only after the department has ascertained that all work performed is in compliance with the applicable rules and regulations.
- All installers must be licensed by the Department of Highway Safety and Motor Vehicles. The installer is authorized to perform all setup operations for the home, including transporting, positioning, blocking, leveling, supporting, tying down, connecting utility systems, making minor adjustments, or assembling multiple or expandable units.
- All manufactured homes shall have support and anchoring at the locations specified in the manufacturer's installation manual for installation in Exposure "D." In the absence of the original manufacturer's installation instructions, the anchoring system shall be designed by a design professional, licensed in the State of Florida.
- Diagonal tie-downs for manufactured homes, in all wind zones, shall be spaced no farther apart than 5 feet 4 inches on center with anchors placed within 2 feet of each end (see also manufacturers' recommendations). In addition, all manufactured homes must

have longitudinal tie-downs or other approved longitudinal stabilizing systems designed to resist horizontal wind loads in the long direction of the home. These longitudinal tie-downs are in addition to the required anchoring systems.

- Additions, including new rooms, roof covers, and porches, are required to be free-standing and self-supporting, with only the flashing attached to the main unit, unless the added unit has been designed to be structurally attached to the existing unit. All additions must be constructed in compliance with state and locally adopted building codes.

It is important to note that, during the MAT assessments for Hurricane Charley, the most significant damage to post-1994 manufactured housing units was caused by failure of attached structures (including new rooms, roof covers, and porches). Typically, the attached structures were directly connected to the manufactured home (not free-standing) and were not capable of withstanding hurricane-force winds. Additional discussion on the performance of manufactured housing is provided in Chapters 3, 4, and 5.

2.5 Floodplain Regulations

The local counties impacted by Hurricane Charley have adopted the laws and regulations of the National Flood Insurance Program (NFIP). The NFIP has identified Special Flood Hazard Areas (SFHAs), which are depicted on the Flood Insurance Rate Maps (FIRMs). The FIRMs provide the base flood elevations (BFEs), which are used to establish minimum floor elevations for buildings in the 100-year flood hazard area. In coastal areas subject to wave action, BFEs include wave height effects. Wave heights greater than 3 feet are shown as Zone VE and require that the lowest horizontal structural member supporting the lowest floor be at or above the BFE.

Charlotte County (which includes Port Charlotte and Punta Gorda) and Lee County (which includes Fort Myers Beach, and Sanibel, Captiva, and North Captiva Islands) entered the NFIP in 1971 and 1984, respectively. The latest effective maps for these areas impacted by Hurricane Charley are dated May 2003.

