Florida Building Code 6th Edition: Advanced Course

2 PDH / 2 CE Hours / 2 AIA LU/HSW

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ANSWER SHEET

First Name:_____ Last Name:_____ Date: _____

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Florida Building Code 6th Edition: Advanced Course

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Florida Building Code 6th Edition: Advanced Course Final Exam

1. **The Florida Building Code 6th Edition replaces the Florida Building Code 5th Edition as of _____.**
   a. 01/31/2018
   b. 12/31/2016
   c. 12/31/2017
   d. 6/30/2018

2. **The Florida Building Code 6th Edition is based off of which of the following?**
   a. 2012 International Building Code
   b. 2015 International Building Code
   c. OSHA Construction Safety
   d. None of the above

3. **To determine the height and area of a building, the allowable value is based on which of the following variables?**
   a. Occupancy classification of the building
   b. Type of construction of the building
   c. Whether or not the building is sprinklered and if it is sprinklered, the type of sprinkler system provided
   d. All of the above

4. **True or false? Basements need not be included in the total allowable floor area of a building provided the total area of such basements does not exceed the area permitted for a one-story above grade plane building.**
   a. True
   b. False

5. **The allowable area of a single-occupancy building with no more than one story above grade plane shall be determined in accordance with Equation 5-1. Which of the following is Equation 5-1?**
   a. Fh = qh(GCr)Af(1b)(N)
   b. F = qzGCfAf(1b)(N)(29.4-1)
   c. Fv = qh(GCr)Ar(1b)(N)
   d. A_a = At + (NS x If)

6. ***Fire walls* designed and constructed in accordance with _____ shall be deemed to comply with section 706.2 Structural stability.**
   a. NFPA 221
   b. NFPA 13
   c. FM Global
   d. Section 903.4.1

7. **An automatic sprinkler system must be installed in a building when the roof is used for which of the following?**
   a. Group A-2 assembly occupancy with an occupant load exceeding 100.
   b. Group A occupancies where the occupant load exceeds 300.
   c. Group B occupancies where the occupant load exceeds 500.
   d. Both A and B are correct

8. **Provisions for limited area sprinkler systems have been revised to reduce the number of sprinklers that may be supplied from a building plumbing system to ____ in a single fire area.**
   a. five
   b. six
   c. seven
   d. eight

9. **Which of the following areas classified by NFPA 13 shall be permitted to be protected by limited area sprinkler systems?**
   a. Light Hazard areas
   b. Ordinary Hazard Group I areas
   c. Ordinary Hazard Group II areas
   d. Both A and B are correct

10. **True or false? Automatic water mist systems are considered equivalent to automatic sprinkler systems.**
    a. True
    b. False

11. **Where a secondary water supply is required for an automatic sprinkler system, an automatic water mist system shall be provided with _____.**
    a. an approved secondary water supply.
    b. an optional secondary water supply.
    c. supervision and alarms.
    d. floor control valves.

12. **Permanent ladders shall be permitted to provide access to which of the following areas?**
    a. Spaces frequented only by personnel for maintenance, repair or monitoring of equipment
    b. Elevated levels in Group U not open to the general public
    c. Nonoccupiable spaces accessed only by catwalks, crawl spaces, freight elevators or very narrow passageways
    d. All of the above

13. **The new exception regarding the use of synthetic underlayments requires them to have a minimum tear strength of ____ lbs in accordance with ASTM D 1970 or ASTM D 4533.**
    a. 10
    b. 15
    c. 20
    d. 25

14. **The attachment of underlayments requires the use of metal cap nails where the ultimate design wind speed, V_{ult}, equals or exceeds _____ mph.**
    a. 125
    b. 150
    c. 100
    d. 75

15. **The exception for using wood structural panels for opening protection in wind-borne debris regions has been revised based on new research. The maximum span has been reduced from 8 feet to _____ inches.**
    a. 30
    b. 72
    c. 44
    d. 96

16. **Storage sheds that are not designed for human habitation and that have a floor area of _____ square feet or less are not required to comply with the mandatory windborne debris impact standards of this code.**
    a. 67
    b. 30
    c. 720
    d. 50

17. **The design wind force for other structures (chimneys, tanks, similar structures, open signs, lattice frameworks and trussed towers) whether ground or roof mounted, shall be determined by which of the following equations?**
    a. Fh = qh(GCr)Af(1b)(N)
    b. F = qzGCfAf(1b)(N)(29.4-1)
    c. Fv = qh(GCr)Ar(1b)(N)
    d. A_a = At + (NS x If)

18. **Many Florida communities and property owners can attest that designing and constructing buildings to account for flood loads and conditions significantly reduces damage. FEMA reports that structures built to NFIP criteria experience _____% less damage through reduced frequency and severity of losses.**
    a. 80
    b. 75
    c. 70
    d. 50

19. **Chapter 16 of the *FBC, Building* requires designers to develop _____, which involves determining flood conditions (flood depth, velocity, scour/erosion, and wave/debris impact).**
    a. flood maps
    b. flood zones
    c. flood provisions
    d. flood loads

20. **Zones V, VE, V1-30, and VO are flood hazard areas identified as which of the following?**
    a. The inland extent of 1.5-foot waves.
    b. Areas subject to flooding by the 500-year flood.
    c. Areas found along open coastlines where, during the base flood, waves are expected to be 3 feet and higher.
    d. Areas along rivers and streams, in isolated areas where floodwaters accumulate without draining to a waterway.

21. **Flood depth can be determined by which of the following?**
    a. By subtracting the ground elevation from the base flood elevation (BFE) shown on the FIRM
    b. By using standard methods for estimating open-channel flow velocities
    c. It can be estimated with the use of the Flood Insurance Study's floodway data table.
    d. All of the above

22. **Many Florida communities adopt requirements for additional elevation above the minimum in the FBC, ranging from _____ to _____ feet above the BFE. This added factor of safety is called "freeboard." Buildings that are higher than the BFE sustain less damage and owners pay lower Federal flood insurance premiums**
    a. 1 to 3 feet
    b. 2 to 4 feet
    c. 3 to 5 feet
    d. 4 to 6 feet

23. **According to *Table 504.3 Allowable Building Height in Feet Above Grade Plane*, a building with the following specifications can be how many feet above grade plane?**
- **Occupancy classification: I-4**
- **Construction type: Type II- A**
- **Sprinkler system: Building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1**
    a. 85
    b. 65
    c. UL
    d. 180

24. **According to *Table 504.4: Allowable Number of Stories Above Grade Plane*, a building with the following specifications can be how many stories above grade plane?**
- **Occupancy classification: A-3**
- **Construction type: Type III-B**
- **Sprinkler system: Building is not equipped throughout with an automatic sprinkler system**
    a. UL
    b. 4
    c. 3
    d. 2

25. **According to *Table 506.2 Allowable Area Factor (At = NS, S1, S13R, or SM, as applicable) in Square Feet*, a building with the following specifications can have an area of how many square feet?**
- **Occupancy classification: F-1**
- **Construction type: Type V-B**
- **Sprinkler system: Building is two stories above grade plane and equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1**
    a. 8,500
    b. 34,000
    c. 25,500
    d. NP

Florida Building Code 6th Edition: Advanced Course

Course Introduction

PDH Academy's 2 CE hour *Florida Building Code 6th Edition: Advanced Course* discusses many highlights and changes from the previous Florida Building Code 5th Edition. It is important to note that the Florida Building Code 5th Edition was based off of the 2012 International Building Code while the Florida Building Code 6th Edition is based off of the 2015 International Building Code. The Florida Building Code 6th Edition is scheduled to replace the Florida Building Code 5th Edition as of 12/31/2017.

This course focuses on the following subjects:

- Building Height & Building Area Modifications
- Structural Stability (Fire Walls)
- Assembly Occupancies on Roofs
- Limited Area Sprinkler Systems
- Automatic Water Mist Systems
- Ladders
- Underlayment
- Protection of Openings
- Rooftop Equipment (HVHZ)
- Flood Resistant Construction

The *Florida Building Code 6th Edition: Advanced Course* is provided in accordance with the requirements of the Florida Department of Business and Professional Regulation (DBPR) for the required Advanced Florida Building Code Module.

This course is designed to cover some of the most significant changes from the 5th Edition to the 6th Edition of the Code. However, this course does not cover every change between the codes. Building professionals will have their own areas of expertise making it essential that every architect, engineer, and contractor carefully study the code sections most affecting their professional practice.

***Disclaimer**: This course is intended to give the reader information current at the time of publication. This course is not a substitute for professional advice and should not be used for guidance or decisions related to a specific design or construction project. This course is not intended to reflect the opinion of any of the entities, agencies, or organizations identified in the materials.*

Chapter 5: General Building Heights and Areas

Building Height & Building Area Modifications

The allowable area and height provisions of the code have been rewritten and reorganized to be more user friendly and provide technical consistency. While the provisions have been completely overhauled, the result is essentially an editorial change.

Table 503 from the 5th Edition (2014) *Florida Building Code, Building* (FBCB), that represented unmodified base allowable area and height data, has been separated into three specific tables and placed in context at the appropriate technical sections for the design or review process.

Table 504.3, "Allowable Building Height in Feet Above Grade Plane", Table 504.4, "Allowable Number of Stories Above Grade Plane" and Table 506.2, "Allowable Area Factor", now provide the allowable value based on the three (3) required variables to determine the height and area of a building:

1. Occupancy classification of the building
2. Type of construction of the building, and
3. Whether or not the building is sprinklered and if it is sprinklered, the type of sprinkler system provided.

Section 504: Building Height and Number of Stories

504.1 General. The height, in feet, and the number of stories of a building shall be determined based on the type of construction, occupancy classification and whether there is an *automatic sprinkler system* installed throughout the building.

> **Exception:** The *building height* of one-*story* aircraft hangars, aircraft paint hangars and buildings used for the manufacturing of aircraft shall not be limited where the building is provided with an *automatic sprinkler system* or *automatic fire-extinguishing system* in accordance with Chapter 9 and is entirely surrounded by public ways or yards not less in width than one and one-half times the *building height*.

504.1.1 Unlimited area buildings. The height of unlimited area buildings shall be designed in accordance with Section 507.

504.1.2 Special Provisions. The special provisions of Section 510 permit the use of special conditions that are exempt from, or modify, the specific requirements of this chapter regarding the allowable heights of buildings based on the occupancy classification and type of construction, provided the special condition complies with the provisions specified in Section 510.

504.2 Mixed occupancy. In a building containing mixed occupancies in accordance with Section 508, no individual occupancy shall exceed the height and number of story limits specified in this section for the applicable occupancies.

504.3 Height in feet. The maximum height, in feet, of a building shall not exceed the limits specified in Table 504.3.

Exception: Towers, spires, steeples, and other roof structures shall be constructed of materials consistent with the required type of construction of the building except where other construction is permitted by Section 1510.2.5. Such structures shall not be used for habitation or storage. The structures shall be unlimited in height where of noncombustible materials and shall not extend more than 20 feet (6096mm) above the allowable building height where of combustible materials (see Chapter 15 for additional requirements).

504.4 Number of stories. The maximum number of stories of a building shall not exceed the limits specified in Table 504.4.

TABLE 504.3 [a]
ALLOWABLE BUILDING HEIGHT IN FEET ABOVE GRADE PLANE

OCCUPANCY CLASSIFICATION	SEE FOOTNOTES	TYPE OF CONSTRUCTION								
		Type I		Type II		Type III		Type IV	Type V	
		A	B	A	B	A	B	HT	A	B
A, B, E, F, M, S, U	NS[b]	UL	160	65	55	65	55	65	50	40
	S	UL	180	85	75	85	75	85	70	60
H-1, H-2, H-3, H-5	NS[c, d]	UL	160	65	55	65	55	65	50	40
	S									
H-4	NS[c, d]	UL	160	65	55	65	55	65	50	40
	S	UL	180	85	75	85	75	85	70	60
I-1 Condition 1, I-3	NS[d, e]	UL	160	65	55	65	55	65	50	40
	S	UL	180	85	75	85	75	85	70	60
I-1 Condition 2, I-2	NS[d, f, e]	UL	160	65	55	65	55	65	50	40
	S	UL	180	85						
I-4	NS[d, g]	UL	160	65	55	65	55	65	50	40
	S	UL	180	85	75	85	75	85	70	60
R	NS[d, h]	UL	160	65	55	65	55	65	50	40
	S13R	60	60	60	60	60	60	60	60	60
	S	UL	180	85	75	85	75	85	70	60

For SI: 1 foot = 304.8 mm.

Note: UL = Unlimited; NS = Buildings not equipped throughout with an automatic sprinkler system; S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1; S13R = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.2.

a. See Chapters 4 and 5 for specific exceptions to the allowable height in this chapter.

b. See Section 903.2 for the minimum thresholds for protection by an automatic sprinkler system for specific occupancies.

c. New Group H occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.5.

d. The NS value is only for use in evaluation of existing building height in accordance with the *Florida Building Code, Existing Building.*

e. New Group I-1 and I-3 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6. For new Group I-1 occupancies Condition 1, see Exception 1 of Section 903.2.6.

f. New and existing Group I-2 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6 and the *Florida Fire Prevention Code.*

g. For new Group I-4 occupancies see Exceptions 2 and 3 of Section 903.2.6.

h. New Group R occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.8.

Table 504.3: Allowable Building Height in Feet Above Grade Plane

TABLE 504.4 [a,b]
ALLOWABLE NUMBER OF STORIES ABOVE GRADE PLANE

OCCUPANCY CLASSIFICATION	SEE FOOTNOTES	TYPE OF CONSTRUCTION								
		Type I		Type II		Type III		Type IV	Type V	
		A	B	A	B	A	B	HT	A	B
A-1	NS	UL	5	3	2	3	2	3	2	1
	S	UL	6	4	3	4	3	4	3	2
A-2	NS	UL	11	3	2	3	2	3	2	1
	S	UL	12	4	3	4	3	4	3	2
A-3	NS	UL	11	3	2	3	2	3	2	1
	S	UL	12	4	3	4	3	4	3	2
A-4	NS	UL	11	3	2	3	2	3	2	1
	S	UL	12	4	3	4	3	4	3	2
A-5	NS	UL	UL	UL	UL	UL	UL	UL	UL	UL
	S	UL	UL	UL	UL	UL	UL	UL	UL	UL
B	NS	UL	11	5	3	5	3	5	3	2
	S	UL	12	6	4	6	4	6	4	3
E	NS	UL	5	3	2	3	2	3	1	1
	S	UL	6	4	3	4	3	4	2	2
F-1	NS	UL	11	4	2	3	2	4	2	1
	S	UL	12	5	3	4	3	5	3	2
F-2	NS	UL	11	5	3	4	3	5	3	2
	S	UL	12	6	4	5	4	6	4	3
H-1	NS[c, d]	1	1	1	1	1	1	1	1	NP
	S									
H-2	NS[c, d]	UL	3	2	1	2	1	2	1	1
	S									
H-3	NS[c, d]	UL	6	4	2	4	2	4	2	1
	S									
H-4	NS[c, d]	UL	7	5	3	5	3	5	3	2
	S	UL	8	6	4	6	4	6	4	3
H-5	NS[c, d]	4	4	3	3	3	3	3	3	2
	S									
I-1 Condition 1	NS[d, e]	UL	9	4	3	4	3	4	3	2
	S	UL	10	5	4	5	4	5	4	3
I-1 Condition 2	NS[d, e]	UL	9	4	3	4	3	4	3	2
	S	UL	10	5						
I-2	NS[d, f]	UL	4	2	1	1	NP	1	1	NP
	S	UL	5	3						
I-3	NS[d, e]	UL	4	2	1	2	1	2	2	1
	S	UL	5	3	2	3	2	3	3	2
I-4	NS[d, g]	UL	5	3	2	3	2	3	1	1
	S	UL	6	4	3	4	3	4	2	2
M	NS	UL	11	4	2	4	2	4	3	1
	S	UL	12	5	3	5	3	5	4	2
R-1	NS[d, h]	UL	11	4	4	4	4	4	3	2
	S13R	4	4						4	3
	S	UL	12	5	5	5	5	5	4	3
R-2	NS[d, h]	UL	11	4	4	4	4	4	3	2
	S13R	4	4	4					4	3
	S	UL	12	5	5	5	5	5	4	3
R-3	NS[d, h]	UL	11	4	4	4	4	4	3	3
	S13R	4	4						4	4
	S	UL	12	5	5	5	5	5	4	4
R-4	NS[d, h]	UL	11	4	4	4	4	4	3	2
	S13R	4	4						4	3
	S	UL	12	5	5	5	5	5	4	3

Table 504.4: Allowable Number of Stories Above Grade Plane

S-1	NS	UL	11	4	2	3	2	4	3	1
	S	UL	12	5	3	4	3	5	4	2
S-2	NS	UL	11	5	3	4	3	4	4	2
	S	UL	12	6	4	5	4	5	5	3
U	NS	UL	5	4	2	3	2	4	2	1
	S	UL	6	5	3	4	3	5	3	2

Note: UL = Unlimited; NP = Not permitted; NS = Buildings not equipped throughout with an automatic sprinkler system; S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1; S13R = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.2.

a. See Chapters 4 and 5 for specific exceptions to the allowable height in this chapter.

b. See Section 903.2 for the minimum thresholds for protection by an automatic sprinkler system for specific occupancies.

c. New Group H occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.5.

d. The NS value is only for use in evaluation of existing building height in accordance with the *Florida Building Code, Existing Building.*

e. New Group I-1 and I-3 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6. For new Group I-1 occupancies, Condition 1, see Exception 1 of Section 903.2.6.

f. New and existing Group I-2 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6 and the *Florida Fire Prevention Code.*

g. For new Group I-4 occupancies, see Exceptions 2 and 3 of Section 903.2.6.

h. New Group R occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.8.

Table 504.4: Allowable Number of Stories Above Grade Plane *(Continued)*

Section 506: Building Area

506.1 General. The floor area of a building shall be determined based on the type of construction, occupancy classification, whether there is an automatic sprinkler system installed throughout the building and the amount of building frontage on public way or open space.

506.1.1 Unlimited area buildings. Unlimited area buildings shall be designed in accordance with Section 507.

506.1.2 Special Provisions. The special provisions of Section 510 permit the use of special conditions that are exempt from, or modify, the specific requirements of this chapter regarding the allowable areas of buildings based on the occupancy classification and type of construction, provided the special condition complies with the provisions specified in Section 510.

506.1.3 Basements. Basements need not be included in the total allowable floor area of a building provided the total area of such basements does not exceed the area permitted for a one-story above grade plane building.

506.2 Allowable area determination. The allowable area of a building shall be determined in accordance with the applicable provisions of Section 506.2.1 through 506.2.4 and Section 506.3.

506.2.1 Single-occupancy, one-story buildings. The allowable area of a single-occupancy building with no more than one story above grade plane shall be determined in accordance with **Equation 5-1:**

$A_a = A_t + (NS \times I_f)$ **(Equation 5-1)**

where:

A_a = Allowable area (square feet)

A_t = Tabular allowable area factor (NS, S1, or S13R value, as applicable) in accordance with Table 506.2.

NS = Tabular allowable area factor in accordance with Table 506.2 for nonsprinklered building (regardless of whether the building is sprinklered).

I_f = Area factor increase due to frontage (percent) as calculated in accordance with Section 506.3.

506.2.2 Mixed-occupancy, one-story buildings. The allowable area of a mixed-occupancy building with no more than one story above grade plane shall be determined in accordance with the applicable provisions of Section 508.1 based on Equation 5-1 for each applicable occupancy.

TABLE 506.2 [a,b]
ALLOWABLE AREA FACTOR (A_t = NS, S1, S13R, or SM, as applicable) IN SQUARE FEET

OCCUPANCY CLASSIFICATION	SEE FOOTNOTES	TYPE OF CONSTRUCTION								
		Type I		Type II		Type III		Type IV	Type V	
		A	B	A	B	A	B	HT	A	B
A-1	NS	UL	UL	15,500	8,500	14,000	8,500	15,000	11,500	5,500
	S1	UL	UL	62,000	34,000	56,000	34,000	60,000	46,000	22,000
	SM	UL	UL	46,500	25,500	42,000	25,500	45,000	34,500	16,500
A-2	NS	UL	UL	15,500	9,500	14,000	9,500	15,000	11,500	6,000
	S1	UL	UL	62,000	38,000	56,000	38,000	60,000	46,000	24,000
	SM	UL	UL	46,500	28,500	42,000	28,500	45,000	34,500	18,000
A-3	NS	UL	UL	15,500	9,500	14,000	9,500	15,000	11,500	6,000
	S1	UL	UL	62,000	38,000	56,000	38,000	60,000	46,000	24,000
	SM	UL	UL	46,500	28,500	42,000	28,500	45,000	34,500	18,000
A-4	NS	UL	UL	15,500	9,500	14,000	9,500	15,000	11,500	6,000
	S1	UL	UL	62,000	38,000	56,000	38,000	60,000	46,000	24,000
	SM	UL	UL	46,500	28,500	42,000	28,500	45,000	34,500	18,000
A-5	NS	UL	UL	UL	UL	UL	UL	UL	UL	UL
	S1									
	SM									
B	NS	UL	UL	37,500	23,000	28,500	19,000	36,000	18,000	9,000
	S1	UL	UL	150,000	92,000	114,000	76,000	144,000	72,000	36,000
	SM	UL	UL	112,500	69,000	85,500	57,000	108,000	54,000	27,000
E	NS	UL	UL	26,500	14,500	23,500	14,500	25,500	18,500	9,500
	S1	UL	UL	106,000	58,000	94,000	58,000	102,000	74,000	38,000
	SM	UL	UL	79,500	43,500	70,500	43,500	76,500	55,500	28,500
F-1	NS	UL	UL	25,000	15,500	19,000	12,000	33,500	14,000	8,500
	S1	UL	UL	100,000	62,000	76,000	48,000	134,000	56,000	34,000
	SM	UL	UL	75,000	46,500	57,000	36,000	100,500	42,000	25,500
F-2	NS	UL	UL	37,500	23,000	28,500	18,000	50,500	21,000	13,000
	S1	UL	UL	150,000	92,000	114,000	72,000	202,000	84,000	52,000
	SM	UL	UL	112,500	69,000	85,500	54,000	151,500	63,000	39,000
H-1	NS[c]	21,000	16,500	11,000	7,000	9,500	7,000	10,500	7,500	NP
	S1									
H-2	NS[c]	21,000	16,500	11,000	7,000	9,500	7,000	10,500	7,500	3,000
	S1									
	SM									
H-3	NS[c]	UL	60,000	26,500	14,000	17,500	13,000	25,500	10,000	5,000
	S1									
	SM									
H-4	NS[c, d]	UL	UL	37,500	17,500	28,500	17,500	36,000	18,000	6,500
	S1	UL	UL	150,000	70,000	114,000	70,000	144,000	72,000	26,000
	SM	UL	UL	112,500	52,500	85,500	52,500	108,000	54,000	19,500
H-5	NS[c, d]	UL	UL	37,500	23,000	28,500	19,000	36,000	18,000	9,000
	S1	UL	UL	150,000	92,000	114,000	76,000	144,000	72,000	36,000
	SM	UL	UL	112,500	69,000	85,500	57,000	108,000	54,000	27,000
I-1	NS[d, e]	UL	55,000	19,000	10,000	16,500	10,000	18,000	10,500	4,500
	S1	UL	220,000	76,000	40,000	66,000	40,000	72,000	42,000	18,000
	SM	UL	165,000	57,000	30,000	49,500	30,000	54,000	31,500	13,500
I-2	NS[d, f]	UL	UL	15,000	11,000	12,000	NP	12,000	9,500	NP
	S1	UL	UL	60,000	44,000	48,000	NP	48,000	38,000	NP
	SM	UL	UL	45,000	33,000	36,000	NP	36,000	28,500	NP
I-3	NS[d, e]	UL	UL	15,000	10,000	10,500	7,500	12,000	7,500	5,000
	S1	UL	UL	45,000	40,000	42,000	30,000	48,000	30,000	20,000
	SM	UL	UL	45,000	30,000	31,500	22,500	36,000	22,500	15,000
I-4	NS[d, g]	UL	60,500	26,500	13,000	23,500	13,000	25,500	18,500	9,000
	S1	UL	121,000	106,000	52,000	94,000	52,000	102,000	74,000	36,000
	SM	UL	181,500	79,500	39,000	70,500	39,000	76,500	55,500	27,000
M	NS	UL	UL	21,500	12,500	18,500	12,500	20,500	14,000	9,000
	S1	UL	UL	86,000	50,000	74,000	50,000	82,000	56,000	36,000
	SM	UL	UL	64,500	37,500	55,500	37,500	61,500	42,000	27,000
R-1	NS[d, h]	UL	UL	24,000	16,000	24,000	16,000	20,500	12,000	7,000
	S13R									
	S1	UL	UL	96,000	64,000	96,000	64,000	82,000	48,000	28,000
	SM	UL	UL	72,000	48,000	72,000	48,000	61,500	36,000	21,000

R-2	NS[d, h]	UL	UL	24,000	16,000	24,000	16,000	20,500	12,000	7,000
	S13R									
	S1	UL	UL	96,000	64,000	96,000	64,000	82,000	48,000	28,000
	SM	UL	UL	72,000	48,000	72,000	48,000	61,500	36,000	21,000
R-3	NS[d, h]	UL	UL	UL	UL	UL	UL	UL	UL	UL
	S13R									
	S1									
	SM									
R-4	NS[d, h]	UL	UL	24,000	16,000	24,000	16,000	20,500	12,000	7,000
	S13R									
	S1	UL	UL	96,000	64,000	96,000	64,000	82,000	48,000	28,000
	SM	UL	UL	72,000	48,000	72,000	48,000	61,500	36,000	21,000
S-1	NS	UL	48,000	26,000	17,500	26,000	17,500	25,500	14,000	9,000
	S1	UL	192,000	104,000	70,000	104,000	70,000	102,000	56,000	36,000
	SM	UL	144,000	78,000	52,500	78,000	52,500	76,500	42,000	27,000
S-2	NS	UL	79,000	39,000	26,000	39,000	26,000	38,500	21,000	13,500
	S1	UL	316,000	156,000	104,000	156,000	104,000	154,000	84,000	54,000
	SM	UL	237,000	117,000	78,000	117,000	78,000	115,500	63,000	40,500
U	NS	UL	35,500	19,000	8,500	14,000	8,500	18,000	9,000	5,500
	S1	UL	142,000	76,000	34,000	56,000	34,000	72,000	36,000	22,000
	SM	UL	106,500	57,000	25,500	42,000	25,500	54,000	27,000	16,500

Note: UL = Unlimited; NP = Not permitted;

For SI: 1 square foot = 0.0929 m^2

NS = Buildings not equipped throughout with an automatic sprinkler systems; S1 = Buildings a maximum of one story above grade plane equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1; SM = Buildings two or more stories above grade plane equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1; S13R = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.2.

a. See Chapters 4 and 5 for specific exceptions to the allowable height in this chapter.

b. See Section 903.2 for the minimum thresholds for protection by an automatic sprinkler system for specific occupancies.

c. New Group H occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.5.

d. The NS value is only for use in evaluation of existing building area in accordance with the *Florida Building Code, Existing Building.*

e. New Group I-1 and I-3 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6. For new Group I-1 occupancies, Condition 1, see Exception 1 of Section 903.2.6.

f. New and existing Group I-2 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6 and the *Florida Fire Prevention Code.*

g. New Group I-4 occupancies see Exceptions 2 and 3 of Section 903.2.6.

h. New Group R occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.8.

Table 506.2 Allowable Area Factor (At = NS, S1, S13R, or SM, as applicable) in Square Feet

Chapter 7: Fire and Smoke Protection Features

Structural Stability (Fire Walls)

The requirement that the fire wall have sufficient structural stability such that it will remain in place for the duration of time indicated by the required fire-resistance rating has been deleted.

706.2 Structural stability. *Fire walls* shall be designed and constructed to allow collapse of the structure on either side without collapse of the wall under fire conditions. *Fire walls* designed and constructed in accordance with NFPA 221 shall be deemed to comply with this section.

Chapter 9: Fire Protection Systems

Assembly Occupancies on Roofs

This is a new section requiring an automatic sprinkler system to be installed in a building when the roof is used for a Group A-2 assembly occupancy with an occupant load exceeding 100, as well as for other Group A occupancies where the occupant load exceeds 300.

[F] 903.2.1.6 Assembly occupancies on roofs. Where an occupied roof has an assembly occupancy with an *occupant load* exceeding 100 for Group A-2 and 300 for other Group A occupancies, all floors between the occupied roof and the *level of exit discharge* shall be equipped with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2.

Exception: Open parking garages of Type I or Type II construction.

Limited Area Sprinkler Systems

Provisions for limited area sprinkler systems have been revised to reduce the number of sprinklers that may be supplied from a building plumbing system to six in a single fire area to eliminate the potential for multiple limited area sprinkler systems and combined water supply demands necessary to control a single fire event. Also revised to limit the six sprinklers to a discharge density of Light Hazard or Ordinary Hazard Group I. The basis for these values provides coordination with longstanding requirements in NFPA 101, Life Safety Code, Section 9.7.1.2, which limits the number and discharge density of automatic sprinklers supplied from a plumbing system.

[F] 903.3.8 Limited area sprinkler systems. Limited area sprinkler systems shall be in accordance with the standards listed in Section 903.3.1 expect as provided in Sections 903.3.8.1 through 903.3.8.5.

903.3.8.1 Number of sprinklers. Limited area sprinkler systems shall not exceed six sprinklers in any single *fire area*.

903.3.8.2 Occupancy hazard classification. Only areas classified by NFPA 13 as Light Hazard or Ordinary Hazard Group 1 shall be permitted to be protected by limited area sprinkler systems.

903.3.8.3 Piping arrangement. Where a limited area sprinkler system is installed in a building with an automatic wet standpipe system, sprinklers shall be supplied by the standpipe system. Where a limited area sprinkler system is installed in a building without an automatic wet standpipe system, water shall be permitted to be supplied by the plumbing system provided that the plumbing system is capable of simultaneously supplying domestic and sprinkler demands.

903.3.8.4 Supervision. Control valves shall not be installed between the water supply and sprinklers unless the valves are of an *approved* indicating type that are supervised or secured in the open position.

903.3.8.5 Calculations. Hydraulic calculations in accordance with NFPA 13 shall be provided to demonstrate that the available water flow and pressure are adequate to supply all sprinklers installed in any single *fire area* with discharge densities corresponding to the hazard classification.

Automatic Water Mist Systems

This is a new section providing requirements for automatic water mist systems. While water mist systems can serve as an alternative, in some applications, to automatic fire sprinkler systems, no exceptions, reductions, or "trade-offs" for water mist systems are granted or permitted as automatic water mist systems are not considered equivalent to automatic sprinkler systems. Automatic water mist systems have been approved by FM Global for occupancies similar to Light Hazard (as defined by NFPA 13) and by UL for occupancies similar to Ordinary Hazard Group I (as defined by NFPA 13).

[F] 904.11 Automatic water mist systems. *Automatic water mist systems* shall be permitted in applications that are consistent with the applicable listing or approvals and shall comply with Sections 904.11.1 through 904.11.3.

[F] 904.11.1 Design and installation requirements. *Automatic water mist systems* shall be designed and installed in accordance with Sections 904.11.1.1 through 904.11.1.4.

[F] 904.11.1.1 General. *Automatic water mist systems* shall be designed and installed in accordance with NFPA 750 and the manufacturer's instructions.

[F] 904.11.1.2 Actuation. *Automatic water mist systems* shall be automatically actuated.

[F] 904.11.1.3 Water supply protection. Connections to a potable water supply shall be protected against backflow in accordance with the *Florida Building Code, Plumbing*.

[F] 904.11.1.4 Secondary water supply. Where a secondary water supply is required for an *automatic sprinkler system*, an *automatic water mist system* shall be provided with an *approved* secondary water supply.

[F] 904.11.2 Water mist system supervision and alarms. Supervision and alarms shall be provided as required for automatic sprinkler systems in accordance with Section 903.4.

[F] 904.11.2.1 Monitoring. Monitoring shall be provided as required for *automatic sprinkler systems* in accordance with Section 903.4.1.

[F] 904.11.2.2 Alarms. Alarms shall be provided as required for *automatic sprinkler systems* in accordance with Section 903.4.2.

[F] 904.11.2.3 Floor control valves. Floor control valves shall be provided as required for *automatic sprinkler systems* in accordance with Section 903.4.3.

[F] 904.11.3 Testing and maintenance. *Automatic water mist systems* shall be tested and maintained in accordance with the *Florida Fire Prevention Code*.

Chapter 10: Means of Egress

Ladders

This is a new section addressing means of egress requirements for spaces such as catwalks above ceilings, mechanical equipment areas, service pits etc. that are occasionally accessed or that are accessed by able bodied trained personnel. Specific areas have been identified where the use of ladders is permitted.

1011.16 Ladders. Permanent ladders shall not serve as a part of the *means of egress* from occupied spaces within a building. Permanent ladders shall be permitted to provide access to the following areas:

1. Spaces frequented only by personnel for maintenance, repair or monitoring of equipment.
2. Nonoccupiable spaces accessed only by catwalks, crawl spaces, freight elevators or very narrow passageways.
3. Raised areas used primarily for purposes of security, life safety or fire safety including, but not limited to, observation galleries, prison guard towers, fire towers or lifeguard stands.
4. Elevated levels in Group U not open to the general public.
5. Nonoccupied roofs that are not required to have *stairway* access in accordance with Section 1011.12.1.
6. Ladders shall be constructed in accordance with Section 306.5 of the *Florida Building Code, Mechanical*.

Chapter 15: Roof Assemblies and Rooftop Structures

Underlayment

There is a new section for underlayment. Underlayment requirements for all roof coverings have been consolidated into a single location in Section R905.1.1. This section requires underlayment to comply with, be applied, and be attached in accordance with New Table 1507.1.1.

There is also a new exception regarding the use of synthetic underlayments which requires them to be an approved alternate to ASTM D 226 Type II and a minimum tear strength of 20 lbs in accordance with ASTM D 1970 or ASTM D 4533. Attachment is required according to the method in Table 1507.1.1 for the applicable roof covering and slope. Metal cap nails are required where V_{ult} equals or exceeds 150 mph.

The required type, installation, and fastening of underlayments for roof coverings have been consolidated into new Table 1507.1.1. Underlayment complying with ASTM D 226 Type II or ASTM D 4869 Type IV (ASTM D 6757 for some roof coverings) is now required for all roof coverings where the roof slope is 4:12 and greater.

1507.1 Scope. Roof coverings shall be applied in accordance with the applicable provisions of this section and the manufacturer's installation instructions.

1507.1.1 Underlayment. Unless otherwise noted, underlayment for asphalt shingles, metal roof panels, metal roof shingles, mineral surfaced roll roofing, slate shingles, wood shingles, and wood shakes shall conform to the applicable standards listed in this chapter. Underlayment materials required to comply with ASTM D226, D1970, D4869 and D6757 shall bear a label indicating compliance to the standard designation and, if applicable, type classification indicated in Table 1507.1.1. Underlayment shall be applied and attached in accordance with Table 1507.1.1.

Exception: A reinforced synthetic underlayment that is approved as an alternative to underlayment complying with ASTM D226 Type II and having a minimum tear strength per ASTM D1970 or ASTM D4533 of 20 pounds (9.1kg) shall be permitted. This underlayment shall be installed and attached in accordance with the underlayment attachment methods of Table 1507.1.1 for the applicable roof covering and slope, except metal cap nails shall be required where the ultimate design wind speed, V_{ult} equals or exceeds 150 mph.

TABLE 1507.1.1 UNDERLAYMENT TABLE				
Roof Covering Section	**Roof Slope 2:12 and Less Than 4:12 Underlayment**	**Underlayment Attachment[a]**	**Roof Slope 4:12 and Greater Underlayment**	**Underlayment Attachment[a]**
Asphalt shingles 1507.2	ASTM D226 Type I or II ASTM D4869 Type II, III or IV ASTM D6757	1	ASTM D226 Type II ASTM D4869 Type IV ASTM D6757	2
	ASTM D1970	3	ASTM D1970	3
Concrete and Clay Tile 1507.3	See Section 1507.3.3			
Metal roof panels 1507.4	ASTM D226 Type I or II ASTM D4869 Type II, III or IV ASTM D6757	1	ASTM D226 Type II ASTM D4869 Type IV ASTM D6757	2
	ASTM D1970	3	ASTM D1970	3
Metal roof shingles roofing 1507.5	ASTM D226 Type I or II ASTM D4869 Type II, III or IV ASTM D6757	1	ASTM D226 Type II ASTM D4869 Type IV ASTM D6757	2
	ASTM D1970	3	ASTM D1970	3
Mineral-surfaced roll roofing 1507.6	ASTM D226 Type I or II ASTM D4869 Type II, III or IV ASTM D6757	1	ASTM D226 Type II ASTM D4869 Type IV ASTM D6757	2
	ASTM D1970	3	ASTM D1970	3
Slate shingles 15.7.7	ASTM D226 Type I or II ASTM D4869 Type II, III or IV ASTM D6757	1	ASTM D226 Type II ASTM D4869 Type IV ASTM D6757	2
	ASTM D1970	3	ASTM D1970	3
Wood shingles 1507.8	ASTM D226 Type I or II ASTM D4869 Type II, III or IV	1	ASTM D226 Type II ASTM D4869 Type IV	2
Wood shakes 1507.9		Limited to roof slopes 4:12 and Greater	ASTM D226 Type II ASTM D4869 Type IV	2
Photovoltaic Shingles 1507.17	ASTM D226 Type I or II ASTM D4869 Type II, III or IV ASTM D6757	1	ASTM D226 Type II ASTM D4869 Type IV ASTM D6757	2
	ASTM D1970	3	ASTM D1970	3

[a]Underlayment Attachment

1. Roof slopes from two units vertical in 12 units horizontal (17-persent slope), and less than four units vertical in 12 units horizontal (33-percent slope). Apply a 19-inch (483 mm) strip of underlayment felt parallel to and starting at the eaves, fastened sufficiently to hold in place. Starting at the eave, apply 36-inch-wide (914 mm) sheets of underlayment, overlapping successive sheets 19 inches (483 mm), end laps shall be 6 inches and shall be offset by 6 feet. The underlayment shall be attached to a nailable deck with corrosion-resistant fasteners with one row centered in the field of the sheet with a maximum fastener spacing of 12 inches (305 mm) o.c., and one row at the end and side laps fastened 6 inches (152 mm) o.c. Underlayment shall be attached using metal or plastic cap nails with a nominal cap diameter of not less than 1 inch. Metal caps shall have a thickness of not less than 32-gage

sheet metal. Power-driven metal caps shall have a minimum thickness of 0.010 inch. Minimum thickness of the outside edge of plastic caps shall be 0.035 inch. The cap nail shank shall be not less than 0.083 inch for ring shank cap nails and 0.091 inch for smooth shank cap nails. Cap nail shank shall have a length sufficient to penetrate through the roof sheathing or not less than ¾ inch into the roof sheathing.
2. Roof slopes of four units vertical in 12 units horizontal (33-percent slope) or greater. Underlayment shall be applied shingle fashion, parallel to and starting from the eave and lapped 4 inches (51 mm), end laps shall be 6 inches and shall be offset by 6 feet. The underlayment shall be attached to a nailable deck with two staggered rows in the field of the sheet with a maximum fastener spacing of 12 inches (305 mm) o.c., and one row at the end and side laps fastened 6 inches (152 mm) o.c. Underlayment shall be attached using metal or plastic cap nails with a nominal cap diameter of not less than 1 inch. Metal caps shall have a thickness of not less than 32-gage sheet metal. Power-driven metal caps shall have a minimum thickness of 0.010 inch. Minimum thickness of the outside edge of plastic caps shall be 0.035 inch. The cap nail shank shall be not less than 0.083 inch for ring shank cap nails and 0.091 inch for smooth shank cap nails. Cap nail shank shall have a length sufficient to penetrate through the roof sheathing or not less than ¾ inch into the roof sheathing.
3. Roof slopes from two units vertical in 12 units horizontal (17-percent slope), and greater. The entire roof deck shall be covered with an approved self-adhering polymer modified bitumen underlayment complying with ASTM D1970(2015a) installed in accordance with both the underlayment manufacturer's and roof covering manufacturer's installation instructions for the deck material, roof ventilation configuration and climate exposure for the roof covering to be installed.
Exception: A minimum 4-inch wide (102 mm) strip of shelf-adhering polymer-modified bitumen membrane complying with ASTM D 1970(2015a), installed in accordance with the manufacturer's instructions for the deck material, shall be applied over all joints in the roof decking. An approved underlayment in accordance with Table 1507.1.1 for the applicable roof covering shall be applied over the entire roof over the 4-inch-wide (102 mm) membrane strips.

Table 1507.1.1 Underlayment Table

Chapter 16: Structural Design

Protection of Openings

The exception for using wood structural panels for opening protection in wind-borne debris regions has been revised based on new research. The maximum span has been reduced from 8 feet to 44 inches. New prescriptive attachment methods are provided for wood, masonry, and concrete construction. The prescriptive fastening table has been deleted.

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 meeting the requirements of ANSI/DASMA 115 (for garage doors and rolling doors) or TAS 201, 202 and 203, AAMA 506, ASTM E1996 and ASTM E1886 referenced herein, or an approved impact-resistant standard as follows:

1. Glazed openings located within 30 feet (9144 mm) of grade shall meet the requirements of the large missile test of ASTM E1996.
2. Glazed openings located more than 30 feet (9144 mm) above grade shall meet the provisions of the small missile test of ASTM E1996.
3. Storage sheds that are not designed for human habitation and that have a floor area of 720 square feet (67 m2) or less are not required to comply with the mandatory windborne debris impact standards of this code.
4. Openings in sunrooms, balconies, or enclosed porches constructed under existing roofs or decks are not required to be protected provided the spaces are separated from the building interior by a wall and all openings in the separating wall are protected in accordance with Section 1609.1.2 above. Such spaces shall be permitted to be designed as either partially enclosed or enclosed structures.

Exceptions:

1. Wood structural panels with a minimum thickness 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 building 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) lagscrews 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.

2. Glazing in *Risk Category* I buildings, including greenhouses that are occupied for growing plants on a production or research basis, without public access shall be permitted to be unprotected.

3. Glazing in *Risk Category* II, III or IV buildings located over 60 feet (18,288 mm) above the ground and over 30 feet (9144 mm) above aggregate surface roofs located within 1,500 feet (458 m) of the building shall be permitted to be unprotected.

Rooftop Equipment (HVHZ)

This section has been revised to modify the rooftop equipment loading requirements in ASCE 7- 10 to permit the use of Section 29.5.1 in ASCE 7-10 for rooftop equipment loads on buildings of all heights. (Consistent with ASCE 7-16.)

1620.6 Rooftop equipment and structures. Sections 29.5 and 29.5.1 of ASCE 7 shall be modified as follows:

29.5 Design wind loads: other structures

The design wind force for other structures (chimneys, tanks, similar structures, open signs, lattice frameworks and trussed towers) whether ground or roof mounted, shall be determined by the following equation:

F = qzGCfAf(1b)(N)(29.4-1)

where:

qz = velocity pressure evaluated at height z as defined in Section 29.3, of the centroid of area Af;

G = gust-effect factor from Section 26.9;

Cf = force coefficients from Figures 29.5-1 through 29.5-3; and

Af = projected area normal to the wind except where Cf is specified for the actual surface area, in square feet (m^2).

29.5.1 Rooftop structures and equipment for buildings.

The lateral force, Fh for rooftop structures and equipment shall be determined as specified below.

Fh = qh(GCr)Af(1b)(N)

where:

GCr = 1.9 for rooftop structures and equipment with Af less than (0.1Bh). (GCr) shall be permitted to be reduced linearly from 1.9 to 1.0 as the value of Af is increased from (0.1Bh) to (Bh);

qh = velocity pressure evaluated at mean roof height of the building; and

Af = vertical projected area of the rooftop structure or equipment on a plane normal to the direction of wind, in square feet (m^2).

The vertical uplift force, Fv, on rooftop structures and equipment shall be determined from Equation (29.5-3).

Fv = qh(GCr)Ar(1b)(N)

where:

(GCr) = 1.5 for rooftop structures and equipment with Ar less than (0.1BL). (GCr) shall be permitted to be reduced linearly from 1.5 to 1.0 as the value of

Ar is increased from (0.1BL) to (BL);

qh = velocity pressure evaluated at the mean roof height of the building; and

Ar = horizontal projected area of rooftop structure or equipment, in square feet (m^2).

Exception: Exposed mechanical equipment or appliances fastened to a roof or installed on the ground in compliance with the code using rated stands, platforms, curbs, slabs, walls, or other means are deemed to comply with the wind-resistance requirements of the 2007 Florida Building Code, as amended. Further support or enclosure of such mechanical equipment or appliances is not required by a state or local official having authority to enforce the Florida Building Code.

Flood Resistant Construction

Overview

Hurricanes and other storms that result in flooding have caused billions of dollars in damage across all parts of Florida. Local jurisdictions throughout the state recognize, plan for and manage development in flood hazard areas. To participate in the National Flood Insurance Program (NFIP), communities agree to regulate all development in flood hazard areas mapped by the Federal Emergency Management Agency (FEMA).

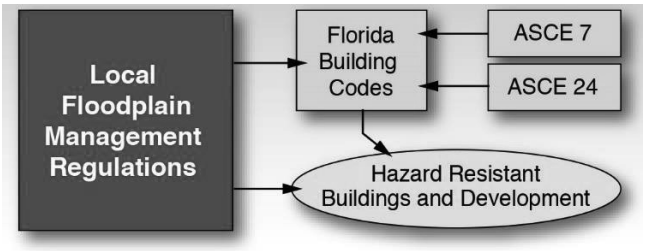
Once an owner or developer makes a decision to construct, add to or substantially improve a building in a flood hazard area, certain requirements intended to minimize future flood damage must be satisfied. Flood provisions for buildings are in the Florida Building Code (FBC), making it easier for design professionals and builders to address the requirements along with other applicable load and design requirements.

The flood provisions of the FBC achieve two broad objectives:

1. As with the rest of the code, the flood provisions help fulfill the purpose of safeguarding public health, safety, and general welfare. Many Florida communities and property owners can attest that designing and constructing buildings to account for flood loads and conditions significantly reduce damage. FEMA reports that structures built to NFIP criteria experience 80% less damage through reduced frequency and severity of losses. Buildings that sustain less damage are more quickly reoccupied, facilitating recovery.
2. The flood provisions fulfill some of the requirements necessary for communities that participate in the NFIP. FEMA states the flood provisions of the International Code Series®, which is the foundation of the FBC, meet or exceed the NFIP requirements for buildings and structures. However, NFIP communities are responsible for regulating all development, including activities that are not within the scope of the codes.

This is accomplished by the adoption of local floodplain management regulations (see graphic). Relying on the model ordinance developed by the Florida Division of Emergency Management (DEM) and approved by FEMA, nearly all Florida communities have adopted local regulations explicitly written to rely on the FBC to satisfy the NFIP requirements for buildings.

Degree of Safety Warning. The degree of flood protection afforded by the flood provisions in the FBC is considered reasonable for regulatory purposes and is based on scientific and engineering considerations. Larger floods can and will occur, flooding land outside of mapped flood hazard areas.



Florida Statute s. 553.73(5) was amended in 2010 to allow communities to adopt local administrative amendments to implement the flood provisions of the FBC and local technical amendments to adopt flood provisions that are more stringent than the FBC (also called "higher standards"). Under most circumstances, local amendments will not sunset when the state adopts a new edition of the code. Model language for some higher standards is available on the DEM webpage.

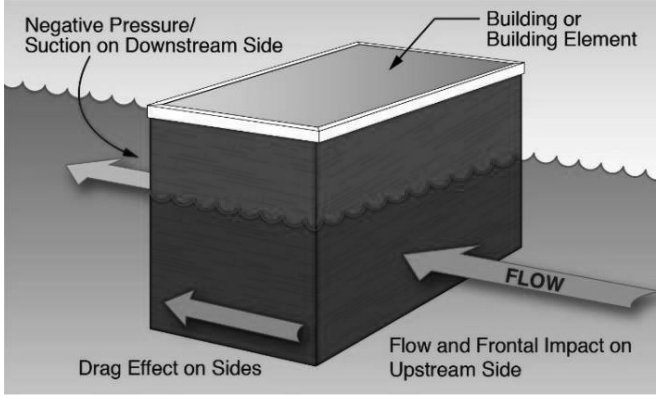
Flood Resistant Construction

The NFIP – and the FBC – requires communities to ensure that new buildings and structures in flood hazard areas are designed and constructed to resist the effects of flood hazards and flood loads. The same requirements apply to existing buildings if proposed work is determined to constitute substantial improvement or repair of substantial damage (both terms are defined in the FBC).

Chapter 16 of the *FBC, Building* requires designers to develop flood loads, which involves determining flood conditions (flood depth, velocity, scour/erosion, and wave/debris impact). Flood loads and load combinations are described in Chapter 5 of ASCE 7, *Minimum Design Loads for Buildings and Other Structures*. Section R322 of the FBC, Residential requires dwellings to be designed and constructed in accordance with specific provisions.

Although hydrostatic load, a function of water depth, is the most obvious load and the easiest to compute, other loads may be more important in final designs. Flood conditions necessary to compute hydrodynamic loads are more difficult to determine (see graphic) and may require consultation with civil or hydraulic engineers. The FBC, Residential requires a design professional to prepare designs for homes in coastal high-hazard areas and Coastal A Zones, but not in other flood zones (see next section for descriptions of flood zones). Designers and builders are cautioned to evaluate whether any flood conditions (such as velocities or waves) may warrant a closer look at flood loads.

Other aspects of flood-resistant construction found in the FBC include the use of flood damage-resistant materials, requirements for enclosures below elevated buildings, and the location of electrical, plumbing, heating, ventilation, and air-conditioning (HVAC) equipment, swimming pools, and tanks.



Flood Hazard Areas and Flood Conditions

Flood Insurance Rate Maps (FIRMs) prepared by FEMA are the most common flood hazard maps adopted by Florida communities. Designers and builders should check with individual communities to determine whether a locally-prepared map is used for regulatory purposes. FIRMs identify flood hazard areas associated with the base flood (the 1%-annual-chance or "100-year" flood). Some FIRMs also identify areas subject to flooding by the less frequent 500-year flood.

FIRMs identify flood hazard areas based on characteristics of flooding:

- Zone A, AE, A1–30, AO, and AH. These zones include flood hazard areas along rivers and streams, in isolated areas where floodwaters accumulate without draining to a waterway and in coastal areas inland of Zone V and along many shorelines. Floodways are designated along some rivers and streams.

Coastal A Zone. Revised FIRMs for coastal communities may have a Limit of Moderate Wave Action (LiMWA) delivered. The area between the LiMWA and the Zone V boundary or the shore is designated the "Coastal A Zone."

- Zone V, VE, V1–30, and VO. These zones identify coastal high-hazard areas found along open coastlines where, during the base flood, waves are expected to be 3 feet and higher.
- Limit of Moderate Wave Action. When shown, the LiMWA identifies the inland extent of 1.5-foot waves and the area between the LiMWA and the Zone V boundary or shoreline is designated as Coastal A Zone.
- Zone X (shaded) identifies areas subject to flooding by the 500-year flood and Zone X (unshaded) identifies land areas that are outside of the 100- and 500-year flood hazard areas.

Some site-specific flood conditions can be determined using FIRMs and associated Flood Insurance Studies, while others can be estimated using the best available information:

- Flood depth, used to compute lateral and vertical hydrostatic loads, is determined by subtracting the ground elevation from the base flood elevation (BFE) shown on the FIRM. Lateral hydrostatic loads need not be considered for enclosures below elevated buildings that have flood openings to allow floodwater to flow in and out automatically. Vertical (buoyant) hydrostatic loads are calculated for elements below the BFE and may be important when soils are saturated.
- Flood velocity, used to compute hydrodynamic load, may be estimated in riverine areas if the Flood Insurance Study has a floodway data table or by using standard methods for estimating open-channel flow velocities (see FEMA's *Recommended Procedures for Flood Velocity Data Development*. In coastal areas there is more uncertainty in estimating flood velocity, which is speed of the mass movement of floodwater, not breaking waves (e.g., as a storm surge moves onshore or recedes). A number of FEMA references include a graph showing velocity as a function of stillwater flood depth (see FEMA P-55, *Coastal Construction Manual*).
- Debris in moving water can impart a considerable impact load when it collides with buildings. Whether debris is likely to be present, and the types and sizes of debris, cannot be determined from flood maps and studies. ASCE 7 Chapter 5 commentary provides guidance for consideration of debris impact loads.
- Wave loads, important in coastal areas, depend largely on wave height. Wave height is a function of stillwater flood depth and may be approximated using information in Flood

Insurance Studies. The magnitude of wave loads can be 10 times or more than wind forces. ASCE 7 Chapter 5 commentary provides guidance on determining wave loads.

- Erosion and scour may affect the stability of foundations and the loss of supporting soils should be considered because it affects flood loads. Refer to FEMA P-55 for guidance on the effects of erosion and scour.
- Duration of flooding, although not a direct contribution to flood loads, is a condition that warrants consideration. Long-duration flooding is more likely to delay reoccupancy and is a factor in whether dry floodproofing measures can be used for nonresidential buildings (not allowed in Zone V). Also, long-duration flooding is likely to cause nonstructural damage even if flood damage-resistant materials are used.

If BFEs are not shown on the flood hazard map, the FBC gives the building official the authority to require the permit applicant to obtain and use data from another source or to determine the design flood elevation (DFE) using accepted engineering practices. Many communities provide applicants with BFE or flood depth information, and some communities may allow the use of approximation methods, such as interpolating the special flood hazard area boundary based on topographic mapping.

FBC, Building- Chapter 1 Administration

Chapter 1 establishes the applicability of the code and describes how the code is to be applied and enforced. This chapter includes flood provisions in a number of sections:

- Hunting "camps" are exempt from the FBC unless certain conditions apply, including location in the "100-year floodplain" (Sec. 102.2).
- Site plans should show flood hazard areas, floodways, and DFEs (Sec. 107.2.5).

BFE and DFE. The codes use the term DFE, which is the same as the BFE unless the community adopts a map showing a more extensive flood hazard area than the SFHA with flood elevations higher than the BFE. Some communities adopt additional maps to show areas prone to flooding outside of the SFHA.

- The minimum plan review criteria include flood hazard areas, flood zones, DFE, lowest floor elevations, enclosures and flood damage-resistant materials (Sec. 107.3.5).
- The authority to issue permits on the basis of affidavits (Sec. 105.1 and Sec. 107.6.1) does not extend to the flood load and flood resistant requirements of the FBC to preserve the NFIP requirement that local officials review and approve permits.
- As part of required inspections, submission of certifications (prepared by a Florida licensed professional surveyor) of the lowest floor elevation are required upon placement of the lowest floor and prior to further vertical construction. Final ("as-built") certifications must be submitted as part of the final inspection (Sec. 110.3).
- Certificates of occupancy are to include a statement that the elevation certificate has been provided and is retained in the community's records (Sec. 111.2).

Also see flood provisions in Sec. 102.2.5 (certain exemptions that may be adopted by enforcement districts), Sec. 102.7 (relocation of manufactured buildings), and Sec. 117.1 (variances in flood hazard areas, which refers to local floodplain management regulations).

FBC, Building

New Flood Requirements in the 6th Ed. FBC. For easy identification in the following descriptions, underlining identifies the flood requirements that are new to the 6th Edition FBC.

Most, but not all, flood provisions in the FBC, Building are found in Sec. 1612, Flood Loads (see Table 1612.1 for a listing of all flood provisions in the FBC). The following highlight key provisions:

- In Sec. 1612.3, flood hazard areas are established by local floodplain management ordinances, which adopt flood hazard maps and supporting data. FEMA Flood Insurance Studies and Flood Insurance Rate Maps (FIRMs) are specified. Some Florida communities adopt locally prepared studies and maps.
- Detailed specifications for flood-resistant design are not included in the code. Rather, Sec. 1612.4 refers to ASCE 24, Flood Resistant Design and Construction, for specific requirements. A number of requirements in ASCE 24 are based on the Flood Design Class that is assigned in Sec. 1603.1.7 (see ASCE 24 for Flood Design Classes, which are similar to risk categories).

Special Detailed Requirements Based on Use and Occupancy. Special detailed requirements (Chapter 4) based on use and occupancy include flood provisions in Sec. 449 (hospitals), Sec. 450 (nursing homes), Sec. 453 (educational facilities), and Sec. 454 (pools).

Notice of Local Higher Standards (Freeboard). Many Florida communities adopt requirements for additional elevation above the minimum in the FBC, ranging from 2 to 4 feet above the BFE. This added factor of safety is called "freeboard." Buildings that are

higher than the BFE sustain less damage and owners pay lower Federal flood insurance premiums (see graphic).

- Elevation requirements depend on flood zone. See the summary of elevation requirements in Highlights of ASCE 24-14 prepared by FEMA. Elevation requirements above the BFE start at +1 foot (Flood Design Class 2) and go up to +2 feet or the 500-year flood elevation, whichever is higher (Flood Design Class 4).
- Coastal A Zones, if designated, are treated as Zone V, although backfilled stemwalls are permitted if foundation designs account for scour.
- Specific requirements for enclosures below elevated buildings are based on flood zone. All enclosure walls must have flood openings, including walls intended to breakaway under wave loads. Enclosures are limited to uses for parking, storage and building access.
- The use of dry floodproofing (only nonresidential occupancies in Zone A) is limited depending on flood velocities and adequate warning time to implement measures that require human intervention. A Florida amendment to ASCE 24 permits dry floodproofing in Coastal A Zones provided designs account for wave loads and potential erosion and scour.
- Utility equipment and machinery that serve buildings are required to be elevated or meet a specific performance expectation. Similar requirements are found in the *FBC, Mechanical; FBC, Plumbing; and FBC, Fuel Gas*.

- Sec. 1612.5 requires submission of elevation certification (also see Sec. 110.3, Inspections) and, if pertinent to specific buildings, design documentation for dry floodproofing, engineered openings, foundation and anchorage, and breakaway walls. Design documentation must be prepared and sealed by registered design professionals.
- Sec. 1804.4 includes requirements for grading and fill. Where allowed in flood hazard areas, fill shall be placed, compacted, and sloped to be stable under flood conditions.
- Sec. 3109 includes requirements for buildings seaward of the Coastal Construction Control Line (CCCL). Areas seaward of the CCCL that are also mapped as flood hazard areas are subject to the more restrictive of the flood requirements. This section is revised in the 6th Edition FBC to minimize differences with Sec. 1612 and ASCE 24.
- Buildings in "high-velocity hurricane zones" (Broward and Miami-Dade counties) are required to comply with the specific provisions for those zones and also the requirements of Sec. 1612, if located in flood hazard areas (Sec. 1601.1).

BASF CCCL Fact Sheet. Visit www.buildingasaferflorida.org to download a fact sheet summary of the revised CCCL requirements.

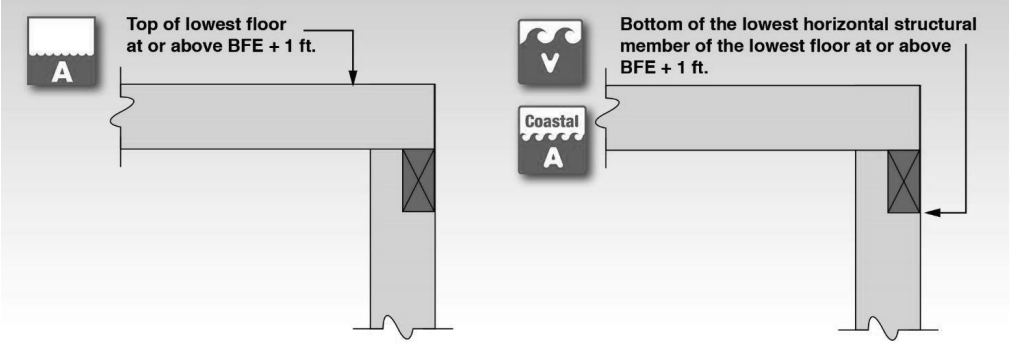
FBC, Residential

Most, but not all, flood provisions in the FBC, Residential are found in Sec. R322, *Flood-Resistant Construction* (see FBC, Building Table 1612.1 for a listing of all flood provisions in the *FBC, Residential*). Unlike the FBC, Building, which refers to ASCE 24, the *FBC, Residential* includes detailed requirements. Dwellings seaward of the CCCL must be in accordance with Sec. 3109 of the *FBC, Building*. The following highlight key provisions:

- New in the 6th Edition, areas subject to wave heights between 1 ½ and 3 feet are delineated (by Limit of Moderate Wave Action) or otherwise designated by the community are Coastal A Zones (CAZ). If CAZs are designated, dwellings in CAZs must comply with the requirements for Zone V in Sec. R322.3.
- In Table R301.2(1), communities adopt local floodplain management ordinances to specify the date of entry into the NFIP and the title and date of the current Flood Insurance Study and FIRMs.
- Sec. R309.3 requires garages to be elevated or, if below the BFE and used solely for parking, access or storage, meet the requirements of Sec. 322 (for enclosed areas below the BFE).
- Sec. R322.1 includes general provisions that apply to dwellings in all flood hazard areas (including Zone A, Zone V, and Coastal A Zones):
  - Dwellings proposed in identified floodways are required to be designed and constructed according to ASCE 24. This requirement recognizes that flooding is deeper and usually flows faster in floodways, which include the channel and adjacent lands that should be reserved to convey floodwaters. Obstructing flow in floodways can cause increases in flood depths, which may cause increased damage on adjacent properties.
  - Sec. R322.1.1 permits use of ASCE 24 in all flood hazard areas as an alternative to the requirements of Sec. R322.
  - In areas commonly referred to as "approximate Zone A" where FIRMs do not specify BFEs, the building official may require use of data available from another source or may require the applicant to determine flood elevations using accepted engineering practices. Keeping

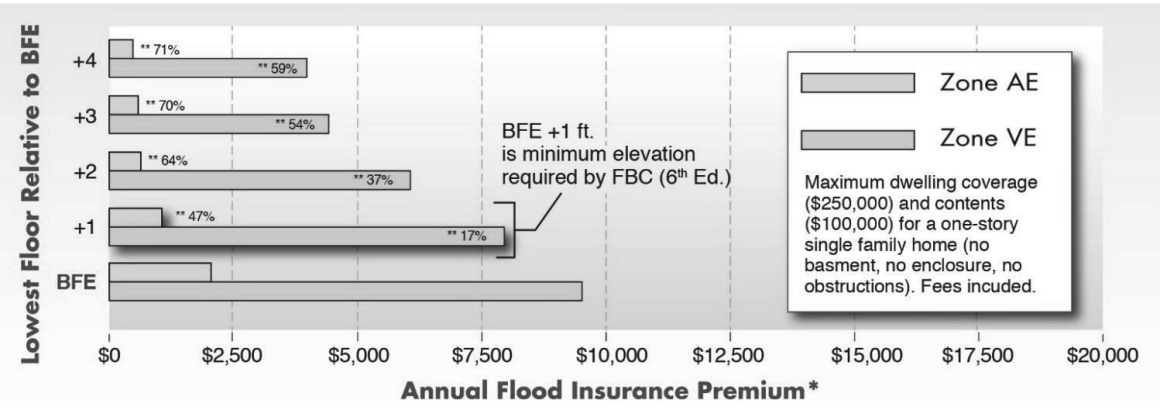
a record of elevations used previously is a good practice so that future permit decisions can be based on the same data.

- The lowest floor is defined as the floor of the lowest enclosed area, but does not include unfinished enclosures below elevated dwellings that comply with the code (see graphic below).
- Unfinished enclosures under elevated buildings are permitted if used only for parking, building access or limited storage (or crawlspace). Building officials should ensure that plans specify enclosed areas are only for those uses. An owner who subsequently modifies an enclosure in any way that alters compliance with these requirements may be subject to higher Federal flood insurance premiums.
- Utility equipment and machinery that serve buildings must be elevated or meet a specific performance expectation that generally cannot be met by typical installations.
- Use of flood damage-resistant materials is required below the elevations required in R322.2 (Zone A) and R322.3 (Zone V and Coastal A Zone). These materials are capable of withstanding direct and prolonged contact with floodwaters without sustaining significant damage. FEMA Technical Bulletin 2, *Flood Damage-Resistant Materials Requirements*, is referenced for materials and installation methods.
- Dwellings seaward of the CCCL that are also in mapped flood hazard areas must comply with the more restrictive of Sec. 3109 of the *FBC, Building* and Sec. R322.
- Minimum elevation requirements call for the lowest floor (see graphic left, previous page), including basement, to be at or above the BFE plus 1 foot or DFE, whichever is higher. The additional elevation, called "freeboard," is required in all flood hazard areas. (see graphic below) Basements and all areas that are below grade on all sides are not permitted.
- The area below elevated dwellings may be enclosed by foundation walls or framed walls. To minimize damage due to hydrostatic loads, flood openings are required (see FEMA Technical Bulletin 1, *Openings in Foundation Walls and Walls of Enclosures*). Flood openings may be prescriptive (providing 1 square inch of net open area for each square foot of enclosed area) or engineered (requires design certification). Measurement of net open area must account for the presence of louvers, blades, screens, and faceplates.
- Tanks may be installed underground or on-grade (if anchored to resist flood loads) or elevated on platforms.



- Sec. R322.2 includes specific requirements that apply in flood hazard areas commonly referred to as "Zone A." (except in Coastal A Zones, which are subject to Sec. R322.3). The Zone A requirements include:

Enclosures and Flood Insurance. Federal flood insurance is more expensive if Zone V buildings have enclosures below the BFE, even if the walls are com-pliant breakaway walls. Insurance is even more expensive if enclosures are larger than 300 square feet.



* Unofficial estimates using 2014 rates; use only for comparison purposes
** Savings over at-BFE premium

- Sec. R322.3 includes specific requirements that apply in coastal high-hazard areas, commonly referred to as "Zone V," and Coastal A Zones:
  - Minimum elevation requirements call for the bottom of the lowest horizontal structural member of the lowest floor (see graphic previous page, right) to be elevated to or above the BFE plus 1 foot or DFE, whichever is higher. The additional elevation, called "freeboard," is required in all flood hazard areas. (see graphic below)
  - Foundations are limited to pilings or columns because they present the least obstruction to the passage of waves. In CAZ, backfilled stemwalls are permitted if foundations have deep footings to account for scour. Foundation designs are required to be certified by a registered design professional.
  - The area under elevated homes must be free of obstruction (see FEMA Technical Bulletin 5, *Free-of-Obstruction Requirements*). The area may be enclosed with insect screening or open lattice or, if enclosed by walls, the walls must be designed to break away under flood loads without causing damage to the foundation or elevated building. FEMA Technical Bulletin 9, *Design and Construction Guidance for Breakaway Walls Below Elevated Coastal Buildings*, includes prescriptive requirements for breakaway walls. The code specifies that utility components are not permitted to be mounted on or penetrate breakaway walls because post-flood investigations have determined that walls with such components do not break away cleanly. Flood openings are required in breakaway walls to minimize wall failure under relatively shallow flooding.
  - An exterior door is required in the doorway at the top of stairways that provide access to dwellings and that are enclosed by breakaway walls.
  - Tanks may be installed underground (if anchored to resist flood loads) or elevated on platforms.
- Dwellings in flood hazard areas in "high-velocity hurricane zones" (Broward and Miami-Dade counties) are required to comply with the specific provisions for those zones and also the requirements of Sec. R322 (also see Sec. R301.1 and Sec. R401.1).
- In Zone A, above-ground pools, on-ground pools and in-ground pools that involve placement of fill are allowed without any special requirements unless located in a floodway, in which case documentation must be provided to evaluate the effects of the encroachment on flood elevations. Pools in Zone V are required to conform to the requirements of ASCE 24, which preclude obstructing flow that causes damage to other buildings. For consistency, Chapter 41, Swimming Pools, cross-references to Sec. R322.
- Chapters with specifications for mechanical systems, HVAC systems, duct construction, combustion air, boilers and water heaters, special piping and storage systems, fuel gas, plumbing, plumbing fixtures, sanitary drainage and vent systems all include flood provisions. In general, the pertinent sections refer to Sec. R322.1.6.

FBC, Existing Building

A fundamental premise of the FBC, Existing Building is that work on an existing building does not lessen the compliance or conformance of the structure. It is important to keep this in mind when considering projects that repair, alter, add to, or otherwise improve buildings in flood hazard areas that were originally built to comply with flood-resistant requirements. For example, the open area under buildings required to be elevated on pilings is permitted to be enclosed by walls only if the walls comply with the flood-resistant construction requirements and if the use of the resulting enclosure is limited only to parking, building access or storage.

The first step when considering work on an existing building in a flood hazard area is to determine whether the proposed work constitutes "substantial improvement" (SI) or repair of "substantial damage" (SD). If a proposal is determined to be SI/SD, then the existing building is required to be brought into compliance with the requirements for new construction found in Sec. 1612 of the FBC, Building or R322 of the FBC, Residential, as applicable.

The SI/SD determination is made by comparing the cost of all of the proposed work to the market value of the building (excluding land) before the work is undertaken. If a proposal is to repair a damaged building, the market value is the value of the building before the damage occurred. When the cost equals or exceeds 50% of the market value, the work is determined to be substantial improvement or repair of substantial damage. In 2010, FEMA published FEMA P-758, Substantial Improvement/Substantial Damage Desk Reference, to summarize extensive guidance, include sample letters and an informative sample packet for applicants, designers and builders (Appendix D). Communities should establish procedures for consistent handling of applications to do work on existing buildings.

Notice of Local Amendments (Cumulative SI). Some Florida communities enforce "cumulative" SI over a specified period of time (e.g., 1, 5 or 10 years or life of the building). These communities keep records and evaluate whether each subsequent proposal to improve or repair a building will trigger the SI requirement to bring the building into compliance with the requirements for new construction.

The flood provisions of the FBC, Existing Building are found in several chapters (see Table 1612.1 for a listing of all flood provisions in the FBC, Existing Building):

- Repairs. Chapter 6 has a general requirement that requires compliance when the repair of a building in a flood hazard area constitutes substantial improvement (Sec. 601.3). Sec. 606.2.4 also specifies that buildings that have sustained substantial damage shall be brought into compliance. Compliance refers to the requirements for new construction in Sec. 1612 of the FBC, Building or Sec. R322 of the FBC, Residential, as applicable.

Reconstruction is New Construction. Reconstruction of a building that is demolished or so significantly damaged that it cannot be repaired is new construction, even if the old foundation can be reused.

- Alterations – Levels 1, 2, and 3. Chapter 7, Alterations – Level 1, has a general requirement that requires compliance when alterations constitute substantial improvement (Sec. 701.3). Because the requirements for alterations are cumulative, the requirement in Chapter 7 also applies to Level 2 alterations (Chapter 8) and Level 3 alterations (Chapter 9).
- Additions. Handling additions is complicated by the fact that some circumstances prompt compliance of the addition as well as the base building. Sec. 1103.5 distinguishes between horizontal additions that are structurally connected and those that are not structurally connected. It also specifies that if vertical additions or foundation work are determined to constitute substantial improvement, then base buildings must be brought into compliance. New or replacement foundations must comply, without requiring SI/SD determinations. DEM's guidance listed in Resources is based on FEMA P-758.
- Historic Buildings. The key to proper enforcement of the flood provisions is whether a historic building meets the exception in Sec. 1201.3. The FBC, Existing Building defines "historic buildings," however, the definition is not entirely consistent with the definition used by the NFIP. The NFIP allows historic buildings in flood hazard areas to be improved and repaired without bringing them into compliance provided the buildings are qualified. Importantly, any proposed work must not preclude such buildings from continued listing as historic. FEMA guidance suggests building officials require applicants to obtain evidence of continued designation from the appropriate authority or a qualified historic resources professional.
- Relocated or Moved Buildings. Sec. 1302.6 specifies that buildings relocated or moved into flood hazard areas are required to comply with the flood provisions of Sec.1612 or R322, as applicable (no determination of substantial improvement). This means new foundations must meet the elevation and other requirements based on the flood zone of the new location.
- Prescriptive Compliance. The sections that articulate the prescriptive compliance method

for additions, alterations, and repairs and each specify that if the work constitutes SI/SD, then the existing building must be brought into compliance with the requirements for new construction (Chapter 4). Similarly, the performance compliance method includes the same requirement (Chapter 14).

FBC, Mechanical, Plumbing, Fuel, Gas

Each of the mechanical, plumbing and fuel gas codes includes similar provisions requiring equipment and systems to be located at or above the elevation specified in Sec. 1612.4 (thus matching the elevation of the building) or to meet a specific performance expectation that generally cannot be met by typical installations. See Table 1612.1 for a listing of all flood provisions in these codes. Of particular note:

- Each code specifies that systems and equipment shall not be mounted on or penetrate walls intended to break away under flood loads (applies in Zone V and Coastal A Zones).
- *FBC, Mechanical* requires ducts to be located above the elevation specified in Sec. 1612.4 or designed and constructed to prevent water from entering or accumulating and to resist flood loads.

Local Floodplain Management Regulations

Florida communities adopt local floodplain management regulations to regulate development activities in identified flood hazard areas. The regulations (typically called "ordinances"), in conjunction with the *Florida Building Code*, meet or exceed the minimum requirements of the NFIP. Development other than buildings includes subdivision of land; filling, grading, and other site improvements and utility installations; placement, installation, or replacement of manufactured homes and manufactured buildings; installation or replacement of tanks; placement of recreational vehicles; installation of swimming pools; and any other development. Importantly, to fulfill the NFIP requirements, floodplain management ordinances also regulate structures, and facilities that are exempt from the *Florida Building Code*.

Local floodplain management regulations are administered in conjunction with the *Florida Building Code*. Key features include:

- Adoption of Flood Insurance Studies and FIRMs to establish flood hazard areas (flood zones).
- Designation of the Floodplain Administrator; in many communities, the Building Official is designated the Floodplain Administrator, while in others the position is assigned to a different office.
- Duties of the Floodplain Administrator, including review of applications for development other than buildings, inspection of permitted development and flood hazard areas, maintenance of records.
- Details of the process for making substantial damage and substantial improvement determinations.
- Specifications for determining flood elevations in areas without BFEs on FIRMs.
- Procedures, limitations, and conditions for evaluating requests for variances, including variances from the flood provisions of the Florida Building Code.
- Requirements for the following:
  - Subdivisions, including manufactured home parks and subdivisions
  - Site improvements and utilities (sanitary sewage facilities and water supply facilities)
  - Placement of fill
  - Manufactured homes, recreational vehicles (including park trailers)
  - Tanks (above-ground and underground)
- Limitations on development in floodways, including fill, fences, retaining walls, roads and watercourses, in addition to buildings and structures. Applications must be accompanied by analyses to determine proposed activities do not increase flood levels.
- General requirements for any development not specifically addressed, including:
  - Anchoring to prevent flotation, collapse or lateral movement resulting from flood loads
  - Use of flood damage-resistant materials
  - Mechanical, plumbing and electrical systems elevated or protected

Assistance from DEM. DEM is designated by the Governor to be the link between Florida communities and the NFIP. Changes to floodplain management ordinances should be reviewed by DEM prior to adoption. Contact the State Floodplain Management Office for guidance.