



Revised Coastal Construction Control Line Requirements in the 6th Edition Florida Building Code (2017)

June 2017

Florida's Coastal Construction Control Line (CCCL) defines portions of beaches and dune systems subject to severe fluctuations based on a 100-year storm event. The CCCL is not a seaward limit for construction of upland structures (as in a setback line). The CCCL delineates the inland limit of areas where special siting and design considerations are necessary to protect the beach-dune system and to protect proposed and existing structures, adjacent properties, and the preservation of public beach access.

For many years the *Florida Building Code* (FBC) has included CCCL requirements for certain buildings in Sec. 3109. Once an owner or developer makes a decision to construct, add to, or substantially improve a building seaward of the CCCL, satisfying these requirements minimizes future storm damage and environmental impacts.

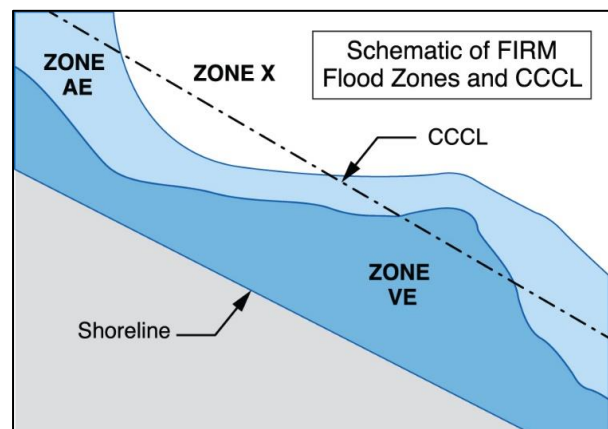
In addition to the CCCL requirements, provisions for buildings in mapped special flood hazard areas (SFHAs) are in the *Florida Building Code, Building*, Sec. 1612, making it easier for design professionals and builders to address the design requirements along with other applicable loads and requirements of the code.

Learn More About the CCCL. For information on the Florida Department of Environmental Protection Beaches and Coastal Systems Programs, including an online tool to view aerial photography with the approximate location of the CCCL and a link to the agency's CCCL permitting requirements visit www.dep.state.fl.us/beaches

BASF Flood Requirements Fact Sheet. Download a fact sheet summary of the flood provisions of the FBC at www.buildingasafeflorida.org.

In response to recommendations made to the Florida Building Commission, the Florida Division of Emergency Management (DEM) proposed revisions to align Sec. 3109 with the coastal high hazard area (Zone V) requirements as much as possible, while retaining specific CCCL requirements that flow from Chapter 161, Fla. Stat. or were requested by the Florida Department of Environmental Protection (DEP), and to incorporate certain Commission interpretations issued by Declaratory Statements. The revised CCCL requirements, developed by the DEP Division of Water Resources Management staff and other stakeholder input, are effective with the 6th Edition FBC.

The benefits of aligning the requirements and resolving inconsistencies as much as possible include elimination of confusing and conflicting requirements, which means design professionals will find it easier to prepare designs that meet both CCCL and flood requirements. In addition, code officials in every jurisdiction with CCCLs will not have to independently determine which requirements are more restrictive. Taken together, improved efficiencies should yield time and cost savings for property owners and communities.



Seventy percent of the land seaward of the CCCL is shown on FIRMs as Zone V, while nearly 20% is Zone A/AE and 10% is Zone X.

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Section 3109 Structures Seaward of a Coastal Construction Control Line

The CCCL requirements in FBC Sec. 3109 apply to the design and construction of habitable structures (a defined term) that are entirely seaward of the CCCL, and to portions of structures that extend seaward of the CCCL. Sec. 3109 does not apply to other structures. It has always been the case that all structures subject to the CCCL requirements and also located in whole or in part in SFHAs are subject to the flood requirements in FBC Sec. 1612 (or local floodplain management regulations). The revised Sec. 3109 makes it clear. [Sec. 3109.1 General]

The revisions of the Sec. 3109 requirements retain the provisions that CCCL requirements do not apply to the modification, maintenance or repair of existing habitable structures provided three conditions are satisfied: (1) work is within the limits of an existing foundation; (2) no additions, repairs or modification of the existing foundation are proposed; and (3) no additions (change in footprint) or enclosures are added below the lowest floor. [Sec. 3109.1.1 Modification, maintenance or repair of existing habitable structures]

Environmental permits from DEP are required before construction starts and permittees are required to submit those permits to building officials. Environmental permits may impose special siting considerations to protect the beach-dune system, proposed or existing structures, and public beach access, and may condition the nature, timing and sequence of construction of permitted activities to provide protection to nesting sea turtles, hatchlings, and their habitat. The permits may require submission and approval of exterior lighting plans. [Sec. 3109.1.2 Approval prior to construction]

In line with FBC Sec. 110.3 Required inspections (foundation inspection), permittees are required to submit the surveyed elevation of the bottom of the lowest horizontal structural member of the lowest floor to building officials. Work performed prior to the building official's review is at the applicant's risk. Sec. 110.3, under final inspections, also requires submission of final (as-built) elevation certifications. [Sec. 3109.1.3 Elevation certification]

CCCL Statutory Allowances Over-riden in SFHAs by SI/SD Requirements.

An important advisory note calls attention to the FBC, Existing Building requirements for existing buildings in SFHAs that are substantially improved or repaired after substantial damage. Regardless of the Sec. 3109.1.1 provision that excludes certain work, compliance with Sec. 1612 is required when buildings in SFHAs are substantially improved or repaired after incurring substantial damage.

Section 3109.2 Definitions

Section 3109 uses some terms that are defined in Sec. 202, including 'Coastal A Zone,' 'Coastal High Hazard Area,' 'Dry Floodproofing,' 'Flood Hazard Area,' 'Special Flood Hazard Area,' 'Substantial Damage,' and 'Substantial Improvement.'

Terms used only in Sec. 3109 are defined in Sec. 3109.2. Some terms are unchanged, some terms are new, and some terms were deleted.

- CCCL terms that are unchanged or essentially unchanged from prior editions include: 'Coastal Construction Control Line,' 'Fifty-Foot Setback Line,' 'Habitable Structure,' 'Lowest Horizontal Structural Member,' and '100-Hundred-Year Storm Elevation.'
- New definitions and significantly modified definitions include:
 - 'Allowed Use' defines uses permitted in enclosures above the elevation specified in ASCE 24 and below the DEP 100-year storm elevation. This applies in areas where the DEP storm elevation is higher than the FEMA base flood elevation (BFE) and in FEMA flood Zone X.
 - 'Combined Total Storm Tide Elevation (Value)' is elevation of combined total tides determined by DEP and published for each coastal county with CCCL. The "Revised Combined Total Storm Tide Frequency Analysis" reports are available online.
 - 'Design Grade' definition is clarified and specifies grades may be determined by site-specific analyses or found in DEP 1999 report "One-Hundred Year Storm Elevation Requirements for Habitable Structures Located Seaward of a Coastal Construction Control Line."
 - 'Low-Rise Building' is a structure with mean roof height less than or equal to 60 ft. A limitation on a configuration of shear walls applies to low-rise buildings (see Sec. 3109.3.2.2, exception).
 - 'Lowest' Floor for CCCL, as with the definition for flood, is defined as the floor of the lowest enclosed area, excluding enclosures that comply with the requirements and limitations of Sec. 3109.3.4.
- Deleted terms include:
 - 'Armoring' is deleted because DEP advises no project has been authorized based on these conditions. The provision is in statute, which means qualifying circumstances can be addressed.
 - 'Breakaway Wall' is defined in ASCE 24.

- ‘Rebuilding’ is deleted because the term is no longer used (rebuilding is new construction).

Section 3109.3 Design and Construction

The primary objective of minimizing differences between the CCCL requirements and the FBC flood requirements is achieved by requiring the design and construction of habitable structures, including substantial improvement and repair of substantial damage, to comply with Sec. 3109, Sec. 1612, and ASCE 24. [Sec. 3109.3 Design and construction]

Over the past decade or more FEMA has used methodologies for determining base flood elevations in coastal flood hazard areas that more closely resemble the methods used to produce the combined total storm tide elevations (values) specified in DEP reports. Very early FEMA maps typically showed BFEs much lower than DEP elevations. Despite the change in FEMA methodologies, there remain many areas where the DEP elevations are higher than the BFEs identified on NFIP Flood Insurance Rate Maps.

Sec. 3109.3.1 Flood loads. For structures located both seaward of the CCCL and in a coastal high hazard area (Zone V), care must be taken when determining flood loads to use the higher of the stillwater elevation specified in NFIP Flood Insurance Studies or the elevations specified in DEP reports. The revised CCCL provisions require flood loads to be determined according to Chapter 5 of ASCE 7 Minimum Design Loads for Buildings and Other Structures.

Sec. 3109.3.2 Foundations.

Consistent with requirements in FBC Sec. 1612 (and the NFIP), foundations for habitable structures must be piles or columns and the space below elevated structures shall be free of obstructions. Foundations must be designed in accordance with ASCE 24 Sec. 4.5, for foundations in coastal high hazard areas and Coastal A Zones.

Preservation of Conforming Structures and Exception for Certain Additions.

An exception to the requirement to comply with Sec. 3109 specifies that additions, repairs, and alterations that, when combined with all other work on a structure, do not constitute substantial improvement or repair of substantial damage, and provided the work does not violate the terms of previously issued permits and additions do not advance the seaward limits of existing structures.

CCCL is More Restrictive than ASCE 24 for Zone V and CAZ.

Section 3109.3.2 does not permit shallow foundations (permitted by ASCE 24 Sec. 4.5 under certain circumstances) and does not permit stem walls (permitted by ASCE 24 in Coastal A Zones).

Sec. 3109.3.2.1 Piles and columns. To preserve long-standing DEP requirements, three specific design requirements for piles and columns are added to ASCE 24 Sec. 4.5. The requirements specify (1) the design ratio for piles and columns (spacing to diameter) unless justified by site specific geotechnical analysis and foundation design; (2) tops of grade beams and pile caps must be at or below natural grade and design grade unless designed for flood and debris loads associated with positioning those elements higher; and (3) pile penetration depth shall consider loss of soil above the design grade.

Sec. 3109.3.2.2 Shear walls. Shear walls can obstruct the free flow of floodwater, divert waves and currents, and contribute to local scour. Shear walls should be used only when calculations demonstrate pile or column foundations cannot provide sufficient resistance to lateral forces on tall buildings. The CCCL specifications for shear walls are a function of wall orientation relative to the shoreline. Although waves approach shorelines from various directions, especially as tropical storms move along the coast, the dominant approach is assumed to be directly onshore.

Shear walls perpendicular or nearly perpendicular to the shoreline are permitted because they generally present less obstruction than those that positioned parallel to the shore. This section considers walls are parallel if oriented less than or equal to ± 20 degrees from a line drawn normal to the shoreline. Shear walls not perpendicular to the shore are permitted if the total length of walls is less than 20% of the length of the building and if wall segments and elevator shafts are positioned to allow floodwater to pass through easily.

An exception to allow longer shear wall length than 20% is available for habitable structures other than low-rise buildings. To qualify for the exception, a site-specific hydraulic analysis must show the longer shear wall length will allow floodwater to flow through without causing substantial increases in flow velocity and drag forces on the structure and neighboring properties. The analyses must be prepared and certified by qualified Florida-registered professional engineers. In addition, the design documentation must state the increased length of shear wall (in excess of 20%) is located landward of the predicted 100-year storm erosion limit.

Sec. 3109.3.3 Elevation standards. A defining characteristic of flood-resistant buildings and structure is elevation above a specified flood elevation. The FBC, Building, by reference to ASCE 24, has required minimum elevations of BFE plus 1 ft. since the 2010 edition. A significant change from previous editions, the 6th Edition FBC, Residential requires all one- and two-family dwellings and townhomes to be elevated to or above the BFE plus 1 ft.

For habitable structures seaward of the CCCL, the bottom of the lowest horizontal structural member of the lowest floor must be elevated (floors of enclosures that comply with Sec. 3109.3.4 are not lowest floors). The required elevation is the higher of

- (1) the elevation specified in ASCE 24 if structures are in Zone V or CAZ;
- (2) the elevation specified by communities; or
- (3) the DEP 100-year storm elevation (DEP provides site-specific elevations upon request).

Adopted Higher Elevations (Freeboard). Florida Statutes permit local technical amendments that are more restrictive than the FBC under certain circumstances (s. 553.73(4), F.S.), and specifically authorizes local technical amendments related to flood hazard areas (s. 553.73(5), F.S.).

Many Florida communities adopt a factor of safety called freeboard, requiring buildings to be elevated higher than the minimum elevation in the FBC. Reflecting reduced risk, Federal flood insurance is rated based on height above BFE, with reduced premiums for every foot above BFE up to 4 feet. See graphic below.

Sec. 3109.3.4 Walls and enclosures below the flood elevation. This section contains the most significant changes from previous FBC editions. The scenarios addressed and the level of detail are prompted by differences between the Sec. 1612 and ASCE 24 requirements for enclosures (especially uses of enclosures) and CCCL requirements and Declaratory Statements.

The section applies to walls below the elevations specified in Sec. 3109.3.3, which is the higher of the elevation specified in ASCE 24, the elevation specified by the local jurisdiction, or the DEM 100-year storm elevation. In all cases, walls other than shear walls (which must comply with Sec. 3109.3.2) must be designed and constructed as breakaway walls in compliance with ASCE 24 Sec. 4.6 using the lesser flood load specified in Sec. 3109.3.1. Elevator shafts and stairways are permitted in compliance with ASCE 24. [Sec. 3109.3.4 #1 and #2]

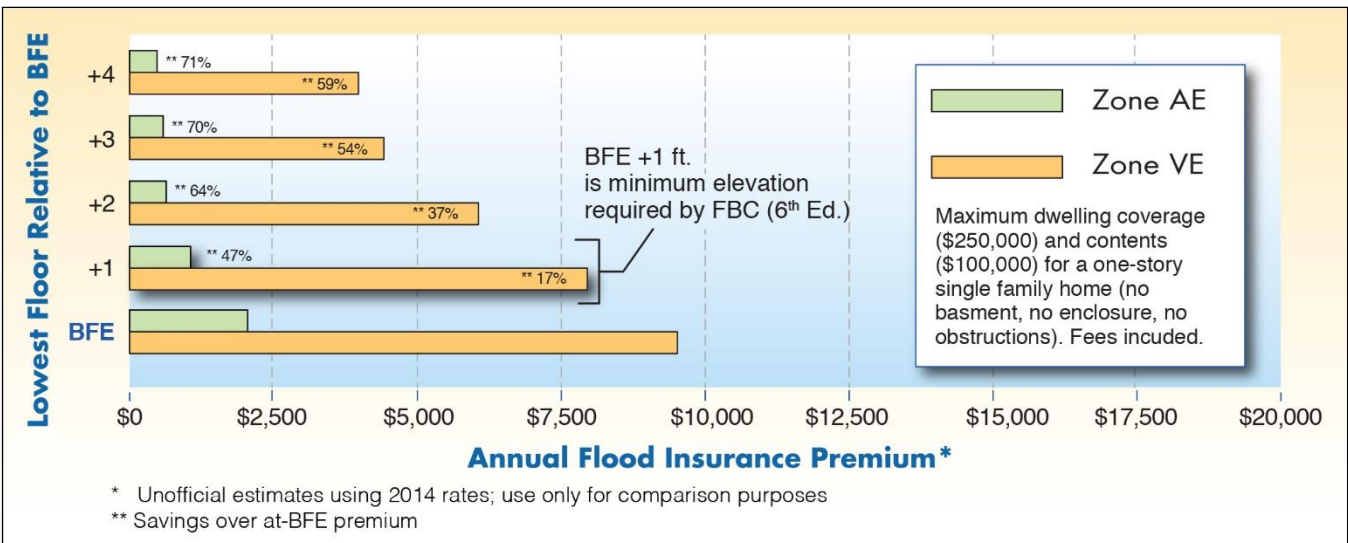
Prior to the 6th Edition changes to Sec. 3109, small mechanical and electrical rooms were permitted below elevated buildings and were not required to break away, allowing construction that would violate the minimum requirements for FEMA Zone V. The revised Sec. 3109 allows dry floodproofed small mechanical and electrical rooms below nonresidential buildings that are elevated, but only in FEMA Zone A and Zone X. Stairwells are not required to break away provided they have flood openings. [Sec. 3109.3.4 #3]

Low-Rise Buildings and Shear Walls.

Consistent with former CCCL requirements, Sec. 3109.2 defines a low-rise building as a structure with a mean roof height less than or equal to 60 ft. While low-rise buildings are permitted with shear walls perpendicular to a shoreline, designers should specify shear walls only where necessary.

FEMA Flood Zone Designations.

The term Zone A refers to all flood zones that start with the letter "A" identified on FIRMs, including zones A, AE, AO, AH, A1-A30. Zone V (including V, VE, VO) refers to coastal high hazard areas. Zone X (shaded) refers to 500-year flood hazard areas and Zone X (unshaded) refers to areas of low flood risk.



New to the 6th Edition FBC, all walls below elevated buildings in SFHAs must have flood openings, including breakaway walls. Breakaway walls are still required to break away prior to experiencing the loads specified in Sec. 3109.3.1, however, by reducing unequal hydrostatic loads across walls, flood openings help walls resist failing under shallower, more frequent flood events. By remaining intact during more frequent flood events, walls with flood openings limit damage and minimize intrusion of wind-borne sand and debris. Sec. 3109.3.4 clarifies that enclosures below elevated building seaward of the CCCL that are in FEMA Zone X do not require flood openings. Other walls that do not require openings are shear walls and walls designed in accordance with dry floodproofing requirements. Where permitted by Sec. 3109 and Sec. 1612, dry floodproofing of nonresidential structures (and nonresidential portions of mixed use structures) must be designed in accordance with ASCE 24. In FBC Sec. 1612.4.1, Florida permits dry floodproofing in Coastal A Zones provided wave loads and the potential for erosion and local scour are accounted for in designs. [Sec. 3109.3.4 #4]

The use of enclosures below elevated buildings in FEMA flood zones is restricted to parking of vehicles, building access, or storage. The use limitation does not apply in Zone A where dry floodproofing is permitted. [Sec. 3109.3.4 #5.a]

In two situations the use of enclosures below elevated buildings is further limited by the new definition for ‘Allowable Use’:

- (1) When enclosures are below the DEP 100-year storm elevation and above the elevation specified by ASCE 24 or the community (or are dry floodproofed to those elevations, if permitted); this situation may occur in areas where the DEP 100-year storm elevation is considerably higher than the FEMA BFE. [Sec. 3109.3.4 #5.b]
- (2) When habitable structures in FEMA Zone X have enclosures below the 100-year storm elevation. [Sec. 3109.3.4 #6]

New Definition ‘Allowed Use.’ For the purpose of Sec. 3109.3.4, use of enclosures above, or with dry floodproofing to, the elevation specified in ASCE 24 and below the 100-year storm elevation, includes, but is not limited to ‘Allowed Uses,’ defined as parking of vehicles, storage, building access, small mechanical and electrical rooms, retail shops, commercial pool bars and other bars, snack bars, commercial grills with portable cooking equipment, commercial dining areas where the permanent kitchen is located landward of the CCCL or above the 100-year storm elevation, toilet rooms and bath-rooms, cabanas, recreational spaces such as gyms and card rooms, commercial service/ storage/ back-of-house facilities; and uses of a similar nature that are not spaces for living, sleeping or cooking.

Sec. 3109.3.5 Structural slabs below the 100-year storm elevation. Slabs below elevated buildings used for parking and enclosures, whether on-ground or above grade, may need to be structural slabs to carry anticipated loads. Such slabs are not required to break away if designed to withstand flood loads. Importantly, buildings with non-breakaway structural slabs must be designed to carry all loads imposed on the slabs.

Multistory Parking Structures. New to ASCE 24-14, Sec. 9.4.3 includes specifications for multi-story parking structures in SFHAs. Although not subject to CCCL requirements because they’re not habitable structures, as defined in Sec. 3109.2, such structures are permitted if not structurally connected to other buildings, if designed to permit the free passage of floodwater and waves, and if they comply other limitations.

Section 3109.4 Documentation

Section 1612.5 specifies documentation that must be prepared and sealed by registered design professionals and submitted to building officials, including surveyed elevations (lowest floor or bottom of the lowest horizontal structural member), certification that foundation designs will resist wind and flood loads (Zone V and CAZ), certain breakaway wall designs, engineered flood openings, and certification of design of dry floodproofed nonresidential buildings.

Seaward of the CCCL, additional signed and sealed documentation is required when site-specific design grades are determined and when shear walls are used, if specified in Sec. 3109.3.2.

Highlighting the More Significant Changes

The following brief descriptions are taken from the reason statement submitted to support the code change proposal resulting in Sec. 3109 in the 6th Edition FBC.

- Although some work on existing habitable structures seaward of the CCCL may be exempt from the CCCL requirements, if those buildings are also in a FEMA-designated flood zone, then the substantial improvement and substantial damage requirements of the FBC, Existing Building apply. Exemption from the CCCL criteria does not have any effect on flood zone requirements.
- Previous Sec. 3109 had a provision related to the presence of armoring that meets certain requirements. This provision was removed because DEP advises no project has been approved based on such armoring.

- The section no longer refers to the 50-foot setback line because the DEP has not approved any new, rebuilt or substantially improved habitable structures seaward of the 50-foot setback in over 20 years.
- A definition for Low-rise Building is added because previously referenced Sec. 1609.2 no longer contained a definition. The proposed definition is equivalent to the definition that used to appear in Sec. 1609.2.
- A new definition for Allowed Use is proposed to address circumstances where there is an enclosed area above the FBC-required building elevation for buildings in flood hazard areas and below the DEP 100-year storm elevation. The term is also used to limit use of enclosures below buildings that are located seaward of CCCL and in a FEMA-designated Zone X. The uses included in the definition were identified in Declaratory Statements issued by the Florida Building Commission.
- A definition for Combined Total Storm Tide Elevation (Value) cites DEP reports for each coastal county with established CCCLs.
- The definition for Habitable Use is modified to remove consideration of potential location for sheltering from storms.
- Design and construction is required to be in accordance with Sec. 3109 and Sec. 1612, which references ASCE 24.
- Flood loads must be determined according to Chapter 5 of ASCE 7, where stillwater depth is determined using the higher of the stillwater elevation from the FEMA Flood Insurance Study (in Zone V) or the combined total storm tide elevation (value) identified by DEP.
- At any given location, the required elevation of the lowest horizontal structural member is the higher of the elevation required by ASCE 24 (for flood hazard areas), the elevation specified by the jurisdiction (to account for communities that elect to adopt higher elevations, called ‘freeboard’), and the DEP 100-year storm elevation.
- Requirements for shear walls are clarified so that walls, wall segments, and elevator shafts are located and positioned to allow floodwater to flow easily around the walls and elevator shafts.
- Elements listed as exceptions under “walls below the 100-year storm elevation” are covered by ASCE 24 (stairwells, screen and lattice, elevator shafts, break-away or frangible walls) or are retained, but specifically permitted only outside of Zone V (dry floodproofed small mechanical and electrical rooms).

- ASCE 24 is the referenced standard for design of breakaway walls.
- Breakaway walls must have flood openings when buildings are located in SFHAs (mirroring ASCE 24-14 and 6th Edition FBC, Residential).
- Uses of enclosures below elevated habitable structures are specified as a function of whether the structure is in an SFHA (Zone A and Zone V) and the enclosure is below the ASCE 24-required elevation or above that elevation but below the 100-year storm elevation, in which case a new term for ‘Allowed Uses’ is defined.
- Swimming pools are not explicitly addressed because they are already regulated by the FBC (and environmental impacts are addressed through the DEP environmental permit).

CCCL Example in FEMA Flood Zone X

Approximately 10 percent of the land seaward of the CCCL is identified on Flood Insurance Rate Maps as Zone X (shaded and unshaded) and thus is “outside” of mapped SFHAs. In these areas, habitable structures must comply with all CCCL design and construction requirements. Of note:

- The flood elevation used to apply the flood load and elevation requirements is the combined total storm tide elevation (value) for the 100-year return period identified in DEM’s reports.
- Use of enclosures below habitable structures is limited to ‘Allowed Use,’ a defined term that permits uses beyond parking, storage, and building access, which are the only uses of enclosures permitted below elevated buildings in FEMA flood zones.

Resources

6th Edition *Florida Building Code*, International Code Council, Inc. Accessible online at www.FloridaBuilding.org.

Florida Department of Environmental Protection, “Revised Combined Total Storm Tide Frequency Analysis” excerpts from county reports, available at www.dep.state.fl.us/beaches/publications/pdf/100yrstrm/100YearCombinedTotalStormTideLevel.pdf.

Florida Department of Environmental Protection, “One-Hundred-Year-Storm Elevation Requirements for Habitable Structures Located Seaward of the Coastal Construction Control Line,” available at www.dep.state.fl.us/beaches/publications/tech-rpt.htm.

Florida Division of Emergency Management, excerpts of the CCCL and flood provisions of the 6th Edition *Florida Building Code* and CCCL side-by-side (revised text compared with previous requirements), available at www.floridadisaster.org/Mitigation/SFMP/lobc_resources.htm.

ASCE 7, *Minimum Design Loads for Buildings and Other Structures* (2010).

ASCE 24, *Flood Resistant Design and Construction* (2014); see *Highlights of ASCE 24-14*; www.floridadisaster.org/Mitigation/SFMP/lobc_resources.htm.

Answers to Specific Questions

Florida Division of Emergency Management, State Floodplain Program Office: 1-850-487-4556 and floods@em.myflorida.com.

Florida Building Commission: 1-850-487-1824 and www.FloridaBuilding.org.

Don't know where to go for an answer to a specific question?

Contact Building A Safer Florida, Inc. 1-850-222-2772 and www.buildingasaferflorida.org.