

DS 2021-005

2020 Florida Building Code 7th Edition (Residential & Building) & ASCE 24-14
Portions of Chapters 3109 and R322

Background:

We are designing a new 3 stories residential home in St. Lucie County of approximately 5,200 SF located seaward of the Coastal Construction Control Line (CCCL) and situated in Zone A (EL+ 7' NAVD) as designated by the FIRM map. Florida Department of Environmental Protection (FDEP) the 100-year storm elevation has determined the lowest habitable floor is EL +17' (NAVD). As per, ASCE 24-14 the proposed home falls within the Coastal High Hazard Areas. According to table 4-1 Minimum Elevation of Bottom of Lowest Supporting Horizontal Structural Member of Lowest Floor: Flood Design Class 2 is BFE + 1 ft or DFE, whichever is higher. The enclosed ground floor will consist of 30'x 77.6' footprint consisting of 2 car garage, foyer, elevator and access stairs. The ground floor will also have a laundry room with a washer and dryer of 8'x6', bathroom 11'x8' and a flex room with 19'x18 with a wet bar. In addition, a storage room of 5'x7', the a/c compressors, water heater and electrical elevator equipment is located on the ground floor as well. The rear wall parallel to ocean is 30' in length and consist of a double french door and single door on a breakaway wall. The 77.6' side walls are perpendicular to shore and designed as a continuous shear walls and are not staggered.

Specifically, there are several code sections and definition set forth in ASCE 24-14, Chapter 31 of Building Volume and Chapter 3 of the Residential Volume that I am requesting clarification on.

According to FBC R322.1.11 the residence would need to comply with both Section R322 and Section 3109 of the Building FBC, but the more restrictive shall apply.

As per Section FBC R322.1.11:

R322.1.11 Structures seaward of a coastal control construction line.

In addition to the requirements of this section, structures located in flood hazard areas and seaward of the coastal construction line shall be designed to resist the predicted forces of a 100-year storm event in accordance with Section R3109 of the Florida Building Code, Building, and the more restrictive provisions shall govern.

In establishing the Design Flood Elevation (DFE) both volumes of the FBC state the following:

FBC 3109.3.3 Elevation Standards

The bottom of the lowest horizontal structural member of the lowest floor shall be at or above the higher of the following:

1. The elevation specified in ASCE 24 Chapter 4 if the structure is in a coastal high hazard area or Coastal A Zone;
2. The elevation specified by the jurisdiction; or
3. The 100-year storm elevation determined by the Florida Department of Environmental Protection (DEP) in the report titled "One-Hundred-Year Storm Elevation Requirements for Habitable Structures Located Seaward of a Coastal Construction Control Line" (1999). An applicant may request determination of a site-specific 100-year storm elevation (see definition).

FBC R322.1.4 Establishing the design flood elevation.

The design flood elevation shall be used to define flood hazard areas. At a minimum, the design flood elevation shall be the higher of the following:

1. The base flood elevation at the depth of peak elevation of flooding, including wave height, that has a 1 percent (100-year flood) or greater chance of being equaled or exceeded in any given year; or
2. The elevation of the design flood associated with the area designated on a flood hazard map adopted by the community, or otherwise legally designated.

The following FBC sections describe conditions below the DFE:

3109.3.4 Walls and enclosures below the flood elevation.

Walls and enclosures below the elevation required by Section 3109.3.3 and above the design grade elevation shall comply with all of the following, as applicable:

1. Walls seaward of the CCCL shall comply with the breakaway wall requirements of ASCE 24 Section 4.6 using the lesser of the flood loads specified by Section 3109.3.1.
4. In special flood hazard areas (Zone V and Zone A), all breakaway walls below the elevation specified in ASCE 24 or the elevation specified by the jurisdiction shall have flood openings in accordance with ASCE 24 Section 4.6.2. Flood openings are not required in:
 - a. Shear walls designed in accordance with Section 3109.3.2.2.
 - b. Walls of enclosures below buildings not located in special flood hazard areas (Zone X).
 - c. Walls that are designed and constructed in conformance with the dry floodproofing requirements of ASCE 24 in areas other than coastal high hazard areas.
5. In special flood hazard areas (Zone V and Zone A):
 - a. Enclosures below the elevation specified in ASCE 24 or the elevation specified by the jurisdiction shall be used solely for parking of vehicles, building access, or storage unless enclosures are designed and constructed in accordance with the dry floodproofing requirements of ASCE 24.
 - b. Enclosures above the elevation specified in ASCE 24 or by the jurisdiction and below the 100-year storm elevation, or enclosures with dry floodproofing to the elevation specified in ASCE 24 or by the jurisdiction, shall be limited to allowed use as defined in this section.
6. In habitable structures not located in special flood hazard areas (Zone X), uses of enclosures below the 100-year storm elevation shall be limited to allowed use as defined in this section.

ALLOWED USE. For the purpose of Section 3109.3.4, use of enclosures above, or with *dry flood proofing* to, the elevation specified in ASCE 24 and below the *100-year storm elevation*, includes, but is not limited to use for 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 *coastal construction control line* or above the *100-year storm elevation*, toilet rooms and bathrooms, 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.

3109.3.2.2 Shear walls.

Shear walls shall comply with one of the following:

1. Shear walls are permitted perpendicular to the shoreline where perpendicular shall mean less than or equal to ± 20 degrees from a line drawn normal to the shoreline.

2. Shear walls not perpendicular to the shoreline shall be limited to a maximum of 20 percent of the building length in the direction running parallel to the shore, and wall segments, spacing between wall segments, and elevator shafts shall be located and positioned to allow floodwater to flow easily around the walls and elevator shafts.

ASCE 24-14 Section 4.5.12 Shear Walls

Shear walls below the DFE shall be oriented parallel to the direction of wave approach where possible and shall be staggered so as not to form a continuous shear wall or an enclosed area.

FBC R322.1.5 Lowest floor.

The lowest floor shall be the lowest floor of the lowest enclosed area, including basement, and excluding any unfinished flood-resistant enclosure that is useable solely for vehicle parking, building access or limited storage provided that such enclosure is not built so as to render the building or structure in violation of this section.

R322.2.2 Enclosed area below design flood elevation.

Enclosed areas, including crawl spaces, that are below the design flood elevation shall:

1. Be used solely for parking of vehicles, building access or storage.
2. Be provided with flood openings that meet the following criteria and are installed in accordance with Section R322.2.2.1

R322.3.6 Enclosed areas below design flood elevation.

Enclosed areas below the design flood elevation shall be used solely for parking of vehicles, building access or storage.

ASCE 24-14 4.6 ENCLOSED AREAS BELOW DESIGN FLOOD ELEVATION

Enclosed areas below the DFE shall be permitted only where all of the following conditions are met:

1. Enclosure walls shall be designed and constructed in accordance with Section 4.6.1 and Section 4.6.2;
2. Enclosed areas shall be used solely for parking of vehicles, building access, or storage; and
3. Where stairways are located inside enclosed areas with breakaway walls, exterior doors shall be required at the entry at the top of the stairs.

Questions:

1. Is the Design Flood Elevation (DFE) for the proposed residence the higher or more restrictive of the BFE of EL+7', the 100-year storm elevation determined by the Florida Department of Environmental Protection (DEP) or the ASCE 24-14 Flood Design Class 2 requirement of BFE + 1 ft?

2. According to FBC 3109.3.4 walls and enclosures below the flood elevation need to comply with item #6. Item #6 states; In habitable structures not located in special flood hazard areas (Zone X), uses of enclosures below the 100-year storm elevation shall be limited to allowed use as defined in this section. Meanwhile section R322.2.2 & R322.3.6 states enclosed areas below DFE shall be used solely for parking of vehicles, building access or storage.

- A. My question is a flex room / game room, bathroom and laundry room and all allowed use per the definition of allowed use permitted below the DFE or does section FBC R322.2.2 the more restrictive limit the use to parking of vehicles, building access or storage?

3. Are the use of breakaway walls required below the DFE for the residence within the CCCL?
4. Can the residence be built entirely of continuous shear walls both parallel and perpendicular to the shore as long it complies with section 3109.3.2.2 without any breakaway walls without the shear walls having to be staggered?

Summary

Petitioner respectfully believes the answer to questions area as follows:

Question #1 – The higher of either FIRM Map, ASCE 24-14 or 100-year Storm Elevation would be the DFE.

Question #2 - The spaces below the DFE shall be used solely for parking of vehicles, building access or storage in residential homes and the allowed uses as per definition are applicable to commercial buildings.

Question #3 - Breakaway walls would be required within the envelope of the structure as to minimize the obstruction of the flood waters and minimize the creation of debris which may impact the surrounding residences. If shear walls are used they shall be staggered as not to form a continuous wall or enclosure.

Respectfully submitted,
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