

CHAPTER 31

SPECIAL CONSTRUCTION

SECTION 3101 GENERAL

3101.1 Scope. The provisions of this chapter shall govern special building construction including membrane structures, temporary structures, *pedestrian walkways* and tunnels, automatic *vehicular gates*, *awnings* and *canopies*, *marquees*, signs, and towers and antennas.

SECTION 3102 MEMBRANE STRUCTURES

3102.1 General. The provisions of Sections 3102.1 through 3102.8 shall apply to air-supported, air-inflated, membrane-covered cable and membrane-covered frame structures, collectively known as membrane structures, erected for a period of 180 days or longer. Those erected for a shorter period of time shall comply with the *Florida Fire Prevention Code*. Membrane structures covering water storage facilities, water clarifiers, water treatment plants, sewage treatment plants, greenhouses and similar facilities not used for human occupancy are required to meet only the requirements of Sections 3102.3.1 and 3102.7. Membrane structures erected on a building, balcony, deck or other structure for any period of time shall comply with this section.

3102.2 Definitions. The following terms are defined in Chapter 2:

AIR-INFLATED STRUCTURE.

AIR-SUPPORTED STRUCTURE.

Double skin.

Single skin.

CABLE-RESTRAINED, AIR-SUPPORTED STRUCTURE.

MEMBRANE-COVERED CABLE STRUCTURE.

MEMBRANE-COVERED FRAME STRUCTURE.

NONCOMBUSTIBLE MEMBRANE STRUCTURE.

3102.3 Type of construction. Noncombustible membrane structures shall be classified as Type IIB construction. Noncombustible frame or cable-supported structures covered by an *approved* membrane in accordance with Section 3102.3.1 shall be classified as Type IIB construction. Heavy timber frame-supported structures covered by an *approved* membrane in accordance with Section 3102.3.1 shall be classified as Type IV construction. Other membrane structures shall be classified as Type V construction.

Exception: Plastic less than 30 feet (9144 mm) above any floor used in greenhouses, where occupancy by the general public is not authorized, and for aquaculture pond covers is not required to meet the fire propagation performance criteria of NFPA 701.

3102.3.1 Membrane and interior liner material. Membranes and interior liners shall be either noncombustible as set forth in Section 703.5 or meet the fire propagation performance criteria of NFPA 701 and the manufacturer's test protocol.

Exception: Plastic less than 20 mil (0.5 mm) in thickness used in greenhouses, where occupancy by the general public is not authorized, and for aquaculture pond covers is not required to meet the fire propagation performance criteria of NFPA 701.

3102.4 Allowable floor areas. The area of a membrane structure shall not exceed the limitations set forth in Table 503, except as provided in Section 506.

3102.5 Maximum height. Membrane structures shall not exceed one *story* nor shall such structures exceed the height limitations in feet set forth in Table 503.

Exception: Noncombustible membrane structures serving as roofs only.

3102.6 Mixed construction. Membrane structures shall be permitted to be utilized as specified in this section as a portion of buildings of other types of construction. Height and area limits shall be as specified for the type of construction and occupancy of the building.

3102.6.1 Noncombustible membrane. A noncombustible membrane shall be permitted for use as the roof or as a skylight of any building or atrium of a building of any type of construction provided it is not less than 20 feet (6096 mm) above any floor, balcony or gallery.

3102.6.1.1 Membrane. A membrane meeting the fire propagation performance criteria of NFPA 701 shall be permitted to be used as the roof or as a skylight on buildings of Types IIB, III, IV and V construction, provided it is not less than 20 feet (6096 mm) above any floor, balcony or gallery.

3102.7 Engineering design. The structure shall be designed and constructed to sustain dead loads; loads due to tension or inflation; live loads including wind, snow or flood and seismic loads and in accordance with Chapter 16.

3102.8 Inflation systems. Air-supported and air-inflated structures shall be provided with primary and auxiliary inflation systems to meet the minimum requirements of Sections 3102.8.1 through 3102.8.3.

3102.8.1 Equipment requirements. This inflation system shall consist of one or more blowers and shall include provisions for automatic control to maintain the required inflation pressures. The system shall be so designed as to prevent overpressurization of the system.

3102.8.1.1 Auxiliary inflation system. In addition to the primary inflation system, in buildings larger than 1,500 square feet (140 m²) in area, an auxiliary inflation system shall be provided with sufficient capacity to

maintain the inflation of the structure in case of primary system failure. The auxiliary inflation system shall operate automatically when there is a loss of internal pressure and when the primary blower system becomes inoperative.

3102.8.1.2 Blower equipment. Blower equipment shall meet all of the following requirements:

1. Blowers shall be powered by continuous-rated motors at the maximum power required for any flow condition as required by the structural design.
2. Blowers shall be provided with inlet screens, belt guards and other protective devices as required by the *building official* to provide protection from injury.
3. Blowers shall be housed within a weather-protecting structure.
4. Blowers shall be equipped with backdraft check dampers to minimize air loss when inoperative.
5. Blower inlets shall be located to provide protection from air contamination. The location of inlets shall be *approved*.

3102.8.2 Standby power. Wherever an auxiliary inflation system is required, an *approved* standby power-generating system shall be provided. The system shall be equipped with a suitable means for automatically starting the generator set upon failure of the normal electrical service and for automatic transfer and operation of all of the required electrical functions at full power within 60 seconds of such service failure. Standby power shall be capable of operating independently for not less than 4 hours.

3102.8.3 Support provisions. A system capable of supporting the membrane in the event of deflation shall be provided for in air-supported and air-inflated structures having an *occupant load* of 50 or more or where covering a swimming pool regardless of *occupant load*. The support system shall be capable of maintaining membrane structures used as a roof for Type I construction not less than 20 feet (6096 mm) above floor or seating areas. The support system shall be capable of maintaining other membranes not less than 7 feet (2134 mm) above the floor, seating area or surface of the water.

SECTION 3103 TEMPORARY STRUCTURES

3103.1 General. The provisions of Sections 3103.1 through 3103.4 shall apply to structures erected for a period of less than 180 days. Tents and other membrane structures erected for a period of less than 180 days shall comply with the *Florida Fire Prevention Code*. Those erected for a longer period of time shall comply with applicable sections of this code.

3103.1.1 Permit required. Temporary structures that cover an area greater than 120 square feet (11.16 m²), including connecting areas or spaces with a common *means of egress* or entrance which are used or intended to be used for the gathering together of 10 or more persons,

shall not be erected, operated or maintained for any purpose without obtaining a *permit* from the *building official*.

3103.2 Construction documents. A *permit* application and *construction documents* shall be submitted for each installation of a temporary structure. The *construction documents* shall include a site plan indicating the location of the temporary structure and information delineating the *means of egress* and the *occupant load*.

3103.3 Location. Temporary structures shall be located in accordance with the requirements of Table 602 based on the *fire-resistance rating* of the *exterior walls* for the proposed type of construction.

3103.4 Means of egress. Temporary structures shall conform to the *means of egress* requirements of Chapter 10 and shall have an *exit access* travel distance of 100 feet (30 480 mm) or less.

SECTION 3104 PEDESTRIAN WALKWAYS AND TUNNELS

3104.1 General. This section shall apply to connections between buildings such as *pedestrian walkways* or tunnels, located at, above or below grade level, that are used as a means of travel by persons. The *pedestrian walkway* shall not contribute to the *building area* or the number of *stories* or height of connected buildings.

3104.2 Separate structures. Connected buildings shall be considered to be separate structures.

Exceptions:

1. Buildings on the same *lot* in accordance with Section 503.1.2 shall be considered a single structure.
2. **Reserved.**

3104.3 Construction. The *pedestrian walkway* shall be of noncombustible construction.

Exceptions:

1. Combustible construction shall be permitted where connected buildings are of combustible construction.
2. *Fire-retardant-treated wood*, in accordance with Section 603.1, Item 1.3, shall be permitted for the roof construction of the *pedestrian walkway* where connected buildings are a minimum of Type I or II construction.

3104.4 Contents. Only materials and decorations *approved* by the *building official* shall be located in the *pedestrian walkway*.

3104.5 Fire barriers between pedestrian walkways and buildings. Walkways shall be separated from the interior of the building by not less than 2-hour *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both. This protection shall extend vertically from a point 10 feet (3048 mm) above the walkway roof surface or the connected building roof line, whichever is lower, down to a point 10 feet (3048 mm) below the walkway and horizontally 10 feet (3048 mm)

from each side of the *pedestrian walkway*. Openings within the 10-foot (3048 mm) horizontal extension of the protected walls beyond the walkway shall be equipped with devices providing a $\frac{3}{4}$ -hour *fire protection rating* in accordance with Section 715.

Exception: The walls separating the *pedestrian walkway* from a connected building and the openings within the 10-foot (3048 mm) horizontal extension of the protected walls beyond the walkway are not required to have a *fire-resistance rating* by this section where any of the following conditions exist:

1. The distance between the connected buildings is more than 10 feet (3048 mm). The *pedestrian walkway* and connected buildings, except for *open parking garages*, are equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1. The wall is capable of resisting the passage of smoke or is constructed of a tempered, wired or laminated glass wall and doors subject to the following:
 - 1.1. The wall or glass separating the interior of the building from the *pedestrian walkway* shall be protected by an *automatic sprinkler system* in accordance with Section 903.3.1.1 and the sprinkler system shall completely wet the entire surface of interior sides of the wall or glass when actuated;
 - 1.2. The glass shall be in a gasketed frame and installed in such a manner that the framing system will deflect without breaking (loading) the glass before the sprinkler operates; and
 - 1.3. Obstructions shall not be installed between the sprinkler heads and the wall or glass.
2. The distance between the connected buildings is more than 10 feet (3048 mm) and both sidewalls of the *pedestrian walkway* are not less than 50 percent open with the open area uniformly distributed to prevent the accumulation of smoke and *toxic gases*.
3. Buildings are on the same *lot* in accordance with Section 503.1.2.
4. Where *exterior walls* of connected buildings are required by Section 705 to have a *fire-resistance rating* greater than 2 hours, the walkway shall be equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1.

The previous exception shall apply to *pedestrian walkways* having a maximum height above grade of three *stories* or 40 feet (12 192 mm), or five *stories* or 55 feet (16 764 mm) where sprinklered.

3104.6 Public way. *Pedestrian walkways* over a *public way* shall comply with Chapter 32.

3104.7 Egress. Access shall be provided at all times to a *pedestrian walkway* that serves as a required *exit*.

3104.8 Width. The unobstructed width of *pedestrian walkways* shall be not less than 36 inches (914 mm). The total width shall be not greater than 30 feet (9144 mm).

3104.9 Exit access travel. The length of *exit access* travel shall be 200 feet (60 960 mm) or less.

Exceptions:

1. *Exit access* travel distance on a *pedestrian walkway* equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 shall be 250 feet (76 200 mm) or less.
2. *Exit access* travel distance on a *pedestrian walkway* constructed with both sides not less than 50 percent open shall be 300 feet (91 440 mm) or less.
3. *Exit access* travel distance on a *pedestrian walkway* constructed with both sides not less than 50 percent open, and equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, shall be 400 feet (122 m) or less.

3104.10 Tunneled walkway. Separation between the tunneled walkway and the building to which it is connected shall be not less than 2-hour fire-resistant construction and openings therein shall be protected in accordance with Table 716.5.

SECTION 3105 AWNINGS AND CANOPIES

3105.1 General. *Awnings* or *canopies* shall comply with the requirements of Sections 3105.2 through 3105.6 and other applicable sections of this code.

3105.2 Definition. The following term **are** defined in Chapter 2:

AWNING.

RETRACTABLE AWNING.

3105.3 Design and construction. *Awnings* and *canopies* shall be designed and constructed to withstand wind or other lateral loads and live loads as required by Chapter 16 **and in accordance with Section 3105.4 of this code** with due allowance for shape, open construction and similar features that relieve the pressures or loads. Structural members shall be protected to prevent deterioration. *Awnings* shall have frames of noncombustible material, *fire-retardant-treated wood*, wood of Type IV size, or 1-hour construction with combustible or noncombustible covers and shall be either fixed, retractable, folding or collapsible.

3105.3.1 Location.

3105.3.1.1 Fabric awnings and fabric-covered frames located over public property or in areas accessible to the general public shall be constructed so that no rigid part of such fabric awnings or fabric-covered frames shall be less than 7 feet 6 inches (2286 mm) from the grade directly below, and no part of the cloth drop shall be less than 7 feet (2134 mm).

3105.3.1.2 A fixed fabric awning or fabric-covered frame shall not extend over public property more than

two-thirds the distance from the property line to the nearest curb line in front of the building site as measured from the exterior face of the building, nor shall any portion be closer than 18 inches (457 mm) to the curb line.

Exceptions:

1. If installed over 14 feet (4267 mm) in height, it may occupy the entire width of the sidewalk.
2. Unless otherwise regulated by local zoning requirements.

3105.3.1.3 Fabric-covered framework in whole or in part of fabric, erected in connection with gasoline service stations may not be erected within 15 feet (4572 mm) of where flammable liquids are transferred.

3105.3.1.4 Movable fabric awnings or fabric covered frames may extend over public property for a distance of not more than 5 feet (1524 mm), provided such awnings or any part thereof maintain a clear height of 8 feet (2438 mm) above the sidewalk. All such movable awnings shall be supported on metal frames attached to the building.

3105.3.1.5 Every fabric awning or fabric-covered frame shall be located as not to interfere with the operation of any exterior standpipe, stairway, fire escape or any means of egress to and from the building.

3105.3.2 Area. No fabric awning or fabric-covered frame shall exceed the area of the building to which it is attached.

3105.3.3 Material.

3105.3.3.1 Fabric used for awnings or fabric-covered frames shall meet the flame propagation performance criteria of NFPA 701 or have a *flame spread index* not greater than 25 when tested in accordance with ASTM E 84 or UL 723.

Exception: Awnings or fabric-covered frames used in conjunction with Group R-3 occupancies.

3105.3.3.2 Supports for fabric awnings and fabric-covered frame shall be of metal or similar durable material.

3105.4 Design.

3105.4.1 Design of the framing members shall not be based on removal or repositioning of parts, or the whole, during periods of 75 mph wind velocity.

3105.4.2 Design of the structural framing members shall be based on rational analysis, using the applicable wind loads of Chapter 16 as shown below.

3105.4.2.1 The wind design loads for any fabric or membrane-covered structure designed with a quick removal or breakaway membrane or fabric at wind velocities of 75 mph, shall be based on the following criteria:

1. Minimum wind speed 105 mph.
2. Exposure Category B, C or D as defined in Chapter 16.

3105.4.2.2 The wind design loads for any fabric or membrane covered structure designed with a permanent or nonremovable fabric or membrane, shall be based on the following criteria:

1. Minimum wind speed velocity as required in Chapter 16, using Figure 1609C.
2. Exposure B, C or D as defined in Chapter 16.

3105.4.3 The fabric portions of awnings and fabric-covered frames shall be securely laced, tied or otherwise fastened to the frame; no rafter or front bar will be permitted in pockets; and in no case shall a rolling curtain be caused to operate over a canopy frame.

3105.4.4 The horizontal projection of cantilevered portions shall not be greater than two times the height, except where the building construction does not permit a proper installation; in which case, variance may be permitted by the building official, based on special design and construction.

3105.5 Rigid awnings and canopy shutters.

3105.5.1 Loads. Rigid awnings and canopy shutters shall be designed to resist the loads set forth in Chapter 16 of this code except that structures or parts thereof which are intended to be removed or repositioned during periods of high wind velocity shall be designed in their open or extended position to design pressures based on a basic wind speed of minimum 115 mph, 3-second wind gust with applicable shape factors and to resist not less than 10 psf (478 Pa) roof live load.

3105.5.2 Where such structure is intended to be folded or otherwise repositioned to close an opening when the building is unattended or act as a storm shutter, the design in the closed position shall also comply with Chapter 16 and shall be impact resistant in accordance with Section 1609.1.2 or 1626 for HVHZ

3105.5.3 Structures designed to be readily removed or repositioned during periods of high wind velocity shall be posted with a legible and readily visible decal or painted instructions to the owner or tenant to remove or reposition the structure or part thereof during such periods of time as are designated by the U.S. Weather Bureau as being a hurricane warning or alert.

3105.6 Canopy materials. *Canopies* shall be constructed of a rigid framework with an *approved* covering that meets the fire propagation performance criteria of NFPA 701 or has a *flame spread index* not greater than 25 when tested in accordance with ASTM E 84 or UL 723.

**SECTION 3106
MARQUEES**

3106.1 General. Marquees shall comply with Section 3106.2 through 3106.5 and other applicable sections of this code.

3106.2 Thickness. The height or thickness of a marquee measured vertically from its lowest to its highest point shall be not greater than 3 feet (914 mm) where the marquee projects more than two-thirds of the distance from the *lot line* to the curb line, and shall be not greater than 9 feet (2743 mm)

where the marquee is less than two-thirds of the distance from the lot line to the curb line.

3106.3 Roof construction. Where the roof or any part thereof is a skylight, the skylight shall comply with the requirements of Chapter 24. Every roof and skylight of a marquee shall be sloped to downspouts that shall conduct any drainage from the marquee in such a manner so as not to spill over the sidewalk.

3106.4 Location prohibited. Every marquee shall be so located as not to interfere with the operation of any exterior standpipe, and such that the marquee does not obstruct the clear passage of *stairways* or *exit discharge* from the building or the installation or maintenance of street lighting.

3106.5 Construction. A marquee shall be supported entirely from the building and constructed of noncombustible materials. Marquees shall be designed as required in Chapter 16. Structural members shall be protected to prevent deterioration.

SECTION 3107 SIGNS

3107.1 General. Signs shall be designed, constructed and maintained in accordance with this code.

SECTION 3108 TELECOMMUNICATION AND BROADCAST TOWERS

3108.1 General. Towers shall be designed and constructed in accordance with the provisions of TIA-222. Towers shall be designed for seismic loads; exceptions related to seismic design listed in Section 2.7.3 of TIA-222 shall not apply. In Section 2.6.6.2 of TIA 222, the horizontal extent of Topographic Category 2, escarpments, shall be 16 times the height of the escarpment.

Exception: Single free-standing poles used to support antennas not greater than 75 feet (22 860 mm), measured from the top of the pole to grade, shall not be required to be noncombustible.

3108.2 Location and access. Towers shall be located such that guy wires and other accessories shall not cross or encroach upon any street or other public space, or over above-ground electric utility lines, or encroach upon any privately owned property without the written consent of the owner of the encroached-upon property, space or above-ground electric utility lines. Towers shall be equipped with climbing and working facilities in compliance with TIA-222. Access to the tower sites shall be limited as required by applicable OSHA, FCC and EPA regulations.

SECTION 3109 STRUCTURES SEAWARD OF A COASTAL CONSTRUCTION CONTROL LINE

3109.1 General.

3109.1.1 Scope. The provisions of Section 3109 shall ensure that structures located seaward of the coastal construction control line are designed to resist the predicted forces associated with a 100-year storm event and shall apply to the following:

1. All habitable structures which extend wholly or partially seaward of a coastal construction control line (CCCL) or 50-foot (15.3 m) setback line.
2. Substantial improvement of or additions to existing habitable structures.
3. Swimming pools that are located in close proximity to a habitable structure or armoring. An environmental permit from the Florida Department of Environmental Protection, requiring special siting considerations to protect the beach-dune system, proposed or existing structures and public beach access, is required prior to the start of construction. The environmental permit may condition the nature, timing and sequence of construction of permitted activities to provide protection to nesting sea turtles and hatchlings and their habitat, including review, submittal and approval of lighting plans.

Exception: The standards for buildings seaward of a CCCL area do not apply to any modification, maintenance or repair of any existing structure within the limits of the existing foundation which does not require, involve or include any additions to, or repair or modification of, the existing foundation of that structure.

3109.1.2 Certification. As part of the permit process and upon placement of the lowest horizontal structural member, the applicant shall submit to the building official certification of the elevation of the lowest horizontal structural member of the lowest floor as built in relation to National Geodetic Vertical Datum (N.G.V.D.). Said certification shall be prepared by or under the direct supervision of a registered land surveyor or professional engineer or architect and certified by the same and be submitted prior to commencing any addition work. Any work undertaken prior to submission of the certification shall be at the applicant's risk. The building official shall review the submitted elevation data, and any deficiencies found shall be corrected by the permit holder immediately and prior to any further work being permitted to proceed.

3109.2 Definitions. The following terms are as defined.

ARMORING. A manmade structure designed to either prevent erosion of the upland property or protect upland structures from the effects of coastal wave and current action. Armoring includes certain rigid coastal structures such as geotextile bags or tubes, seawalls, revetments, bulkheads, retaining wall or similar structures, but does not include jetties, groins or other construction whose purpose is to add sand to the beach and dune system, alter the natural coastal currents or stabilize the mouths of inlets.

BREAKAWAY WALL. A partition independent of supporting structural members that is intended to withstand design wind forces but to collapse from a water load less than that which would occur during a 100-year storm event without

causing collapse, displacement or other structural damage to the elevated portion of the building or supporting foundation system.

COASTAL CONSTRUCTION CONTROL LINE. The line established by the State of Florida pursuant to Section 161.053, *Florida Statutes*, and recorded in the official records of the county which defines that portion of the beach-dune system subject to severe fluctuations based on a 100-year storm surge, storm waves or other predictable weather conditions.

DESIGN GRADE. The predicted eroded grade caused by the 100-year storm.

FIFTY-FOOT SETBACK LINE. A line of jurisdiction, established pursuant to the provisions of Section 161.052, *Florida Statutes*, in which construction is prohibited within 50 feet (15.13 m) of the line of mean high water at any riparian coastal location fronting the Gulf of Mexico or the Atlantic coast shoreline.

HABITABLE STRUCTURE. Structures designed primarily for human occupancy and are potential locations for shelter from storms. Typically included within this category are residences, hotels and restaurants.

LOWEST HORIZONTAL STRUCTURE MEMBER. Any shore-parallel structural member which supports floor, wall or column loads and transmits them to the pile foundation.

ONE-HUNDRED-YEAR STORM ELEVATION. The height of the breaking wave crest or wave approach as superimposed on the storm surge with dynamic wave set-up of a 100-year storm. This 100-year storm elevation is determined by the Florida Department of Environmental Protection based on studies published as part of the coastal construction control line establishment process and an analysis of topographic and other site specific data.

REBUILDING. See definition of “Substantial improvement.”

SUBSTANTIAL IMPROVEMENT. See Section 1612.

3109.3 Elevation standards. All habitable structures shall be elevated at or above an elevation which places the lowest horizontal structural member above the 100-year storm elevation as determined by the Florida Department of Environmental Protection in the report titled “One-Hundred-Year Storm Elevation Requirements for Habitable Structures Located Seaward of a Coastal Construction Control Line.”

An applicant may request the Department of Environmental Protection to determine a site-specific 100-year storm elevation for the applicant’s proposed habitable structure as part of the environmental permit application process. The elevation will be provided as part of the applicant’s environmental permit and shall be subject to review under the provisions of Chapter 120, *Florida Statutes*.

Exceptions:

1. Additions, repairs or modifications to existing non-conforming habitable structures that do not advance the seaward limits of the existing habitable structure

and do not constitute rebuilding of the existing structure.

2. Habitable structures located landward of existing armoring which is capable of protecting buildings from the effects of erosion from a 100-year storm surge. The applicant shall provide scientific and engineering evidence that the armoring has been designed, constructed and maintained to survive the effects of the design storm and provide protection to existing and proposed structures from the erosion associated with that event. Evidence shall include a report with data and supporting analysis, and shall be certified by a professional engineer registered in this state, that the armoring was designed and constructed and is in adequate condition to meet the following criteria:
 - a. The top must be at or above the still water level, including setup, for the design storm plus the breaking wave calculated at its highest achievable level based on the maximum eroded beach profile and highest surge level combination, and must be high enough to preclude runoff overtopping.
 - b. The armoring must be stable under the design storm including maximum localized scour, with adequate penetration and toe protection to avoid settlement, toe failure, or loss of material from beneath or behind the armoring.
 - c. The armoring must have sufficient continuity or return walls to prevent flanking under the design storm from impacting the proposed construction.
 - d. The armoring must withstand the static and hydrodynamic forces of the design storm.

3. A higher elevation standard is required by either the National Flood Insurance Program (NFIP), as found on a community’s Flood Insurance Rate Map (FIRM), or the local flood damage prevention ordinance. In such instances, the higher elevation standard shall apply.

3109.4 Construction standards.

3109.4.1 Pile foundations. All habitable structures shall be elevated on, and securely anchored to, an adequate pile foundation. Pile foundations for habitable structures shall be designed to withstand all reasonable anticipated erosion, scour and loads resulting from a 100-year storm including wind, wave, hydrostatic and hydrodynamic forces acting simultaneously with typical structural (live and dead) loads. All habitable structures should be anchored to their pile foundation in such a manner as to prevent flotation, collapse or lateral displacement. The elevation of the soil surface to be used in the calculation of pile reactions and bearing capacities for habitable structures shall not be greater than that which would result from erosion caused by a 100-year storm event. Calculation of the design grade shall account for localized scour resulting from the presence of structural components. Design ratio or pile spacing to pile diameter should not be

less than 8:1 for individual piles located above the design grade. Pile caps shall be set below the design grade unless designed to resist increased flood loads associated with setting the cap above the design grade, but at or below the natural grade. Pile penetration shall take into consideration the anticipated loss of soil above the design grade.

Exceptions:

1. Additions, repairs or modifications to existing nonconforming habitable structures that do not advance the seaward limits of the existing habitable structure and do not constitute rebuilding of the existing structure.
2. Habitable structures located landward of existing armoring which is capable of protecting buildings from the effects of erosion from a 100-year storm surge. The applicant shall provide scientific and engineering evidence that the armoring has been designed, constructed and maintained to survive the effects of the design storm and provide protection to existing and proposed structures from the erosion associated with that event. Evidence shall include a report with data and supporting analysis, and shall be certified by a professional engineer registered in this state, that the armoring was designed and constructed and is in adequate condition to meet the following criteria:
 - a. The top must be at or above the still water level, including setup, for the design storm plus the breaking wave calculated at its highest achievable level based on the maximum eroded beach profile and highest surge level combination, and must be high enough to preclude runoff overtopping.
 - b. The armoring must be stable under the design storm, including maximum localized scour, with adequate penetration and toe protection to avoid settlement, toe failure or loss of material from beneath or behind the armoring.
 - c. The armoring must have sufficient continuity or return walls to prevent flanking under the design storm from impacting the proposed construction.
 - d. The armoring must withstand the static and hydrodynamic forces of the design storm.

3109.4.2 Walls below the 100-year storm elevation. No substantial walls or partitions shall be constructed below the level of the first finished floor of habitable structures. All other walls shall be designed to break away.

Exceptions:

1. Stairways and stairwells;
2. Shear walls perpendicular to the shoreline;
3. Shear walls parallel to the shoreline, which are limited to a maximum of 20 percent of the building length in the direction running parallel to the shore;

4. Shear walls parallel to the shoreline, which exceed 20 percent of the total building length (including any attached major structure) when they meet the following criteria:
 - a. A certification is provided by a Florida-registered professional engineer that certifies that the increased length of shear walls, over 20 percent, are located landward of the 100-year erosion limit;
 - b. A hydraulic analysis is provided and certified by a Florida-registered professional engineer that evaluates the potential impact of flow increase on the subject parcel and adjacent properties;
 - c. The hydraulic analysis demonstrates that although the overall shearwall coverage is more than 20 percent, the increased shearwall length will not result in substantial increase of flow velocities and drag forces on the structural components of the proposed structure and neighboring structures; and
 - d. The provisions under Section 3109.4.2 (Exception 4) do not include any low-rise building as defined in Section 1609.2.
5. Wind or sand screens constructed of fiber or wire mesh;
6. Light, open lattice partitions with individual, wooden lattice strips not greater than $\frac{3}{4}$ -inch (19 mm) thick and 3-inches (76 mm) wide;
7. Elevator shafts;
8. Small mechanical and electrical rooms; and
9. Break-away or frangible walls.

3109.5 Flood loads during a 100-year storm.

3109.5.1 Load basis. The structural design shall be based on the 100-year storm as determined by the Florida Department of Environmental Protection in studies published as part of the coastal construction control line establishment process. Breaking, broken and nonbreaking waves shall be considered as applicable. Design wave loading analysis shall consider vertical uplift pressures and all lateral pressures to include impact, as well as dynamic loading and the harmonic intensification resulting from repetitive waves.

3109.5.2 Hydrostatic load. Habitable structures shall be designed in consideration of the hydrostatic loads which would be expected under the conditions of maximum inundation associated with a 100-year storm event. Calculations for hydrostatic loads shall consider the maximum water pressure resulting from a fully peaked, breaking wave superimposed on the design storm surge with dynamic wave setup. Both free and confined hydrostatic loads shall be considered. Hydrostatic loads which are confined shall be determined using the maximum elevation to which the confined water would freely rise if unconfined. Vertical hydrostatic loads shall be considered as forces acting both vertically downward and upward on

horizontal or inclined surfaces of major structures (e.g., floors, slabs, roofs, walls). Lateral hydrostatic loads shall be considered as forces acting horizontally above and below grade on vertical or inclined surfaces of major structures and coastal or shore protection structures. Hydrostatic loads on irregular or curving geometric surfaces may be determined in consideration of separate vertical and horizontal components acting simultaneously under the distribution of the hydrostatic pressures.

3109.5.3 Hydrodynamic loads. Habitable structures shall be designed in consideration of the hydrodynamic loads which would be expected under the conditions of a 100-year storm event. Calculations for hydrodynamic loads shall consider the maximum water pressures resulting from the motion of the water mass associated with a 100-year storm event. Full-intensity loading shall be applied on all structural surfaces above the design grade which would affect the flow velocities.

3109.6 Wind loads. All habitable structures shall be designed in accordance with Chapter 16.

3109.7 Swimming pools. Swimming pools located in close proximity to an existing habitable structure or armoring shall be designed with an adequate pile foundation for the erosion and scour conditions of a 100-year storm event.

3109.8 Storm debris. All structures will be designed to minimize the potential for wind and water-borne debris during a storm.

SECTION 3110 AUTOMATIC VEHICULAR GATES

3110.1 General. *Automatic vehicular gates* shall comply with the requirements of Sections 3110.2 through 3110.4 and other applicable sections of this code.

3110.2 Definition. The following term is defined in Chapter 2:

VEHICULAR GATE.

3110.3 Vehicular gates intended for automation. *Vehicular gates* intended for automation shall be designed, constructed and installed to comply with the requirements of ASTM F 2200.

3110.4 Vehicular gate openers. *Vehicular gate* openers, where provided, shall be *listed* in accordance with UL 325.

SECTION 3111 SOLAR PHOTOVOLTAIC PANELS/MODULES

3111.1 General. Solar photovoltaic panels/modules shall comply with the requirements of this code and the *Florida Fire Prevention Code*.

SECTION 3112 DEPOSIT OF MATERIAL IN TIDEWATER REGULATED

3112.1 It is not lawful for any person to discharge or cause to be discharged or deposit or cause to be deposited, in the tide

or salt waters of any bay, port, harbor or river of this state, any ballast or material of any kind other than clear stone or rock, free from gravel or pebbles, which said clear stone or rock shall be deposited or discharged only in the construction of enclosures in connection with wharves, piers, quays, jetties or in the construction of permanent bulkheads connecting the solid and permanent portion of wharves. It is lawful to construct three characters of bulkheads for retention of material in solid wharves.

1. First, clear stone or rock enclosures, or bulkheads, may be built upon all sides to a height not less than 2½ feet (762 mm) above high watermark; and after the enclosures have been made so solid, tight and permanent as to prevent any sand, mud, gravel or other material that may be discharged or deposited in them from drifting or escaping through such enclosures, any kind of ballast may be discharged or deposited within the enclosures. The enclosures may be constructed of wood, stone and rock combined, the stone and rocks to be placed on the outside of the wood to a height not less at any point than 2½ feet (762 mm) above high watermark; and after the enclosures have been made so solid, tight and permanent as to prevent any sand, mud gravel or other material that may be discharged or deposited in them from drifting or escaping through such enclosures, any kind of ballast may be discharged or deposited within the enclosures.
2. Second, a bulkhead may be built by a permanent wharf consisting of thoroughly creosoted piles not less than 12 inches (305 mm) in diameter at the butt end, to be driven close together and to be capped with timber not less than 10- or 14-inches drift (254 or 302 mm), bolted to each pile, and one or more longitudinal stringers to be placed on the outside of the bulkhead and securely anchored by means of iron rods to piles driven within the bulkheads, clear rock to be on the inside of the bulkhead, to a height of not less than 2½ feet (762 mm) above high water; and after this is done, ballast or other material may be deposited within the permanent enclosure so constructed.
3. Third, a bulkhead may be constructed to consist of creosoted piles, as described herein, driven not exceeding 4 feet (1219 mm) apart from center to center, inside of which two or more longitudinal stringers may be placed and securely bolted to the piles. Inside of these longitudinal pieces, two thicknesses of creosoted sheet piling are to be driven, each course of the sheet piling to make a joint with the other to form an impenetrable wharf; and within this permanent bulkhead so constructed, any ballast or other material may be deposited.
4. No such enclosure, pier, quay or jetty shall be begun until the point whereat it is to be built shall have been connected by a substantial wharf with a shore or with a permanent wharf; except that the owners of wharves may at any time, with the consent of the Board of Pilot Commissioners of the Division of Professions of the Department of Business and Professional Regulation, build wharves of clear stone or rock, or creosoted walls as hereinafter provided, on each side of their wharves

from the shore to a point at which the water is not more than 15-feet (4.6 m) deep, and when such walls have attained a height of 2½ feet (762 mm) above high watermark and have been securely closed at the deep-water end by stone or creosoted walls of the same height, any kind of ballast may be deposited in them.

5. Nothing contained in this section shall interfere with any rights or privileges now enjoyed by riparian owners. While this section empowers those who desire to construct the several characters of wharves, piers, quays, jetties and bulkheads provided for and described herein, nothing in this section shall be so construed as to require any person not desiring to construct a permanent wharf by filling up with ballast, stone or other material to construct under the specifications contained herein; and nothing in this chapter shall be so construed as to prevent any person from constructing any wharf or placing any pilings, logs or lumber in any waters where the person would have heretofore had the right so to do.

3112.2 This section shall not prohibit Escambia County from placing in Pensacola Bay, on the Escambia County side, beside the old Pensacola Bay Bridge, certain materials, as recommended by the Department of Environmental Protection, in coordination with the Fish and Wildlife Conservation Commission, to increase the number of fish available for persons fishing from the old Pensacola Bay Bridge.

3112.3 This section shall not prohibit Manatee County from placing in the Manatee County portions of Sarasota Bay and Tampa Bay and in the Manatee River, certain materials, as recommended by the Department of Environmental Protection, in coordination with the Fish and Wildlife Conservation Commission, to increase the number of fish available for persons fishing in the above areas.

3112.4 This section shall not prohibit Pinellas County from placing in Tampa Bay certain materials as recommended by the Department of Environmental Protection, in coordination with the Fish and Wildlife Conservation Commission, to increase the number of fish available for persons fishing in the bay. Deposit of material on a wharf or quay is regulated. It is not lawful for any person to deposit or cause to be deposited on any wharf or quay, any ballast, stone, earth or like material, except such wharf or quay may be so secured as to prevent such ballast or other material from washing into the waters of the harbor.

SECTION 3113 LIGHTING, MIRRORS, LANDSCAPING

3113.1 Each operator of an automated teller machine that controls the access area or defined parking area to be lighted shall comply with Sections (2), (3), and (4) no later than one year after October 1, 1994. If the access area or defined parking area to be lighted is controlled by a person other than the operator, such other person shall comply with Sections (2), (3), and (4) no later than one year after October 1, 1994.

3113.2 Each operator, or other person responsible for an automated teller machine pursuant to Sections 655.960

through 655.965, shall provide lighting during the hours of darkness with respect to an open and operating automated teller machine and any defined parking area, access area and the exterior of an enclosed automated teller machine installation, as follows:

1. There shall be a minimum of 10 footcandle (108 lux) power at the face of the automated teller machine and extending in an unobstructed direction outward 5 feet (1.5 m).
2. There shall be a minimum of 2 footcandle (21.5 lux) power within 50 feet (15.25 m) in all unobstructed directions from the face of the automated teller machine. If the automated teller machine is located within 10 feet (3 m) of the corner of the building and the automated teller machine is generally accessible from the adjacent side, there shall be a minimum of 2 footcandle (21.5 lux) power along the first 40 unobstructed feet (12 m) of the adjacent side of the building.
3. There shall be a minimum of 2 footcandle (12.5 lux) power in that portion of the defined parking area within 60 feet (18 m) of the automated teller machine.
4. The operator shall provide reflective mirrors or surfaces at each automated teller machine which provide the customer with a rear view while the customer is engaged in using the automated teller machine.
5. The operator, or other person responsible pursuant to Sections 655.960 through 655.965 for an automated teller machine, shall ensure that the height of any landscaping, vegetation or other physical obstructions in the area required to be lighted pursuant to Section (2) for any open and operating automated teller machine shall not exceed 3 feet (914 mm), except that trees trimmed to a height of 10 feet (3 m) and whose diameters are less than 2 feet (610 mm) and manmade physical obstructions required by statute, law, code, ordinance or other governmental regulation shall not be affected by this section.

SECTION 3114 AIRPORT NOISE

3114.1 Airport noise study guidelines. The Aviation Safety and Noise Abatement Act of 1979 14 CFR Part 150 (US Department of Transportation) including revisions through January 2005 and hereby adopted as a guideline for establishing airport noise control. When required by a local government by local ordinance to provide noise attenuation in a new structure or addition to an existing structure near an airport in the area of the local government, the applicant must provide either:

1. A testing certificate from an accredited noise testing lab that a new structure or addition to existing structure built to the submitted engineering plans will achieve an average minimum dBA reduction equal to or greater than the reduction required,
2. An engineering judgment signed and sealed by an engineer licensed in the State of Florida that the structure or addition built to the submitted engineering plans will

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- achieve an average minimum dBA reduction equal to
- or greater than the reduction required, or
- 3. Plans using the standards contained in “Guidelines for
- Sound Insulation of Residences Exposed to Aircraft

Operations” prepared for the Department of the Navy by Wyle Research and Consulting, Arlington, Virginia, April 2005 on file with the Florida Building Commission.

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