

FBC Advanced

Residential

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Introduction

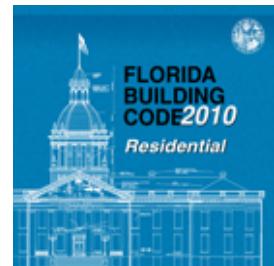
The 2010 Florida Building Code (FBC) is based on the International Code Council (ICC) family of codes, 2009 edition. Like the ICC codes, the FBC consists of several volumes, including:

- Building
- Residential
- Mechanical
- Plumbing
- Fuel Gas
- Energy
- Accessibility

Each separate volume is indicated after the title of Florida Building Code. An example is the Residential volume. It is indicated as the “Florida Building Code, Residential” and abbreviated “FBCR”. Technical electrical requirements are not contained in the Florida Building Code. Refer to the National Electric Code for electrical requirements. Many other codes and standards may be referenced in the Florida Building Code as well.

The Florida Building Code, Residential regulates single family dwellings, duplexes, and townhouses (as defined by the code) not more than three stories in height with a separate means

of egress, and their accessory structures. Multi-family structures such as apartments, condominiums, hotels, resorts, dormitory housing and residential structures



greater than three stories in height are regulated by the Florida Building Code, Building. Any time a large number of occupants and multiple floors are involved, particularly when the occupants are unfamiliar with the building and are sleeping, the codes become more restrictive. Typically the construction of these types of structures is more fire resistant than other residential housing. The Florida Building Code, Residential is less restrictive than the Florida Building Code,

Building because it is assumed that in a single dwelling unit (home), residents are more familiar with the building and escape routes.

The Florida Building Code, including the Florida Building Code, Residential (FBCR) is available online at www.floridabuilding.org.

CHAPTERS OF THE FLORIDA BUILDING CODE, RESIDENTIAL

The Florida Building Code, Residential is intended to be inclusive of all the requirements for construction of a residential structure covered by this code. However, the code may reference requirements in other codes such as the Florida Building Code, Building, Mechanical, Plumbing, National Electrical Code, etc, or Standards such as ASTM, ANSI, ASCE, etc, for other or additional requirements.

Each discipline is addressed in the following chapters of the FBCR:

Chapters 1-10	Building
Chapter 11	Energy
Chapters 12-23	Mechanical
Chapter 24	Fuel Gas
Chapters 25-33	Plumbing
Chapter 34-40	Electrical
Chapter 41-42	Swimming Pools
Chapter 43	Referenced Standards
Chapter 44	Hurricane Zone

Note: Some of the chapters listed above are not addressed in this course.

CHAPTER 1

ADMINISTRATION

Most of the administrative requirements of the Florida Building Code are contained in the Florida Building Code, Building. Each sub-code, including the Florida Building Code, Residential refers you to the Florida Building Code,

Building for these administrative requirements. This keeps all of the administrative requirements in one place.

Chapter 1 pertains to the scope of code as well as to the process of applying for building permits, plan review, and subsequent inspections during the construction phase. Check with the local city building department for all city, county, and state codes that regulate the approval process.

The provisions of the FBC, Residential in Section R101.2 Scope shall apply to the construction, alteration, movement, enlargement, replacement, repair, equipment, use and occupancy, location, removal, and demolition of detached one- and two-family dwellings and townhouses not more than three stories in height above grade plane with separate means of egress and their accessory structures.

As stated earlier, the following criteria must be met to use the FBCR:

1. Single family home
2. Two family home (duplex)
3. Multiple single-family dwellings (townhouses) as defined by the FBCR
4. No more than 3 stories high

Each dwelling/home must have its own separate means of egress. If a multi-family complex has entrance doors that exit into corridors and/or the structure is over three stories, it is regulated by the Florida Building Code, Building which has much stricter regulations on materials, construction practices, and means of egress.

Note that the scope includes any type of remodeling work, including additions, remodeling of existing spaces including movement of walls, and replacement of equipment such as air conditioning units, hot water heaters, etc.

CHAPTER 3

BUILDING AND PLANNING

The Florida Building Code, Residential does not require the structure to be classified based on construction type. There is no area and height limitation

table such as Table 500 in the Florida Building Code, Building; however the height of structures is still limited to 3 stories in the FBCR. Additionally, the height of any wall is limited by the materials utilized to construct the walls, as well as the limitations within the design document utilized.

Structures shall be designed and built to resist dead loads, live loads, roof loads, flood loads, and wind loads. The design and construction of structures shall provide a complete load path to transfer all loads from their point of origin to the foundation. Table R301.5 shows minimum distributed live loads and Table 301.6 is Minimum Roof Live Loads.

TABLE R301.5 MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS (in pounds per square foot)	
USE	LIVE LOAD
Attics without storage	10
Attics with limited storage	20
Habitable attics and attics served with fixed stairs	30
Balconies (exterior) and decks	40
Fire escapes	40
Guardrails and handrails	200
Guardrail in-fill components	50
Passenger vehicle garages	50
Rooms other than sleeping room	40
Sleeping rooms	30
Stairs	40

R301.1.3 Engineered Design

Sometimes in the design of a residential building, the architect, contractor, or designer will discover that the design they created cannot be constructed in accordance with the prescriptive requirements of the code, or they exceed the limits of R301. Section R301.1.3 Engineered Design allows for engineered design for these structural elements, provided the design professional can demonstrate that the extent of such design is compatible with the performance of a conventionally framed system. Engineered design in accordance with the Florida Building Code, Building is permitted for all buildings and structures, and parts thereof, included in the scope of this code.

R301.2 Climatic and Geographic Design Criteria

Section R301.2 Climatic and Geographic Design Criteria contains design criteria for buildings and structures such as wind design, seismic design, and damage due to weathering or termites. These are listed in Table R301.2(1) Climatic and Geographic Design Criteria Table.

R 301.2.1 Wind Limitations

Wind design speeds are based on Figure R301.2(4) Ultimate Design wind speeds. This map is derived from ASCE-7 2010 edition which was adopted by the Florida Building Commission to be included in the 2010 Florida Building Code. This is a different map than the one in the previous FBC. This map also indicates where the wind borne debris region is located.

Where loads for wall coverings, curtain walls, roof coverings, exterior windows, skylights, and exterior doors (other than garage doors) are not otherwise specified, the loads listed in Table R301.2(2) Component and Cladding Loads, adjusted for height and exposure per Table R301.2(3) Height and Exposure Adjustment Coefficients, are used to determine design load performance requirements.

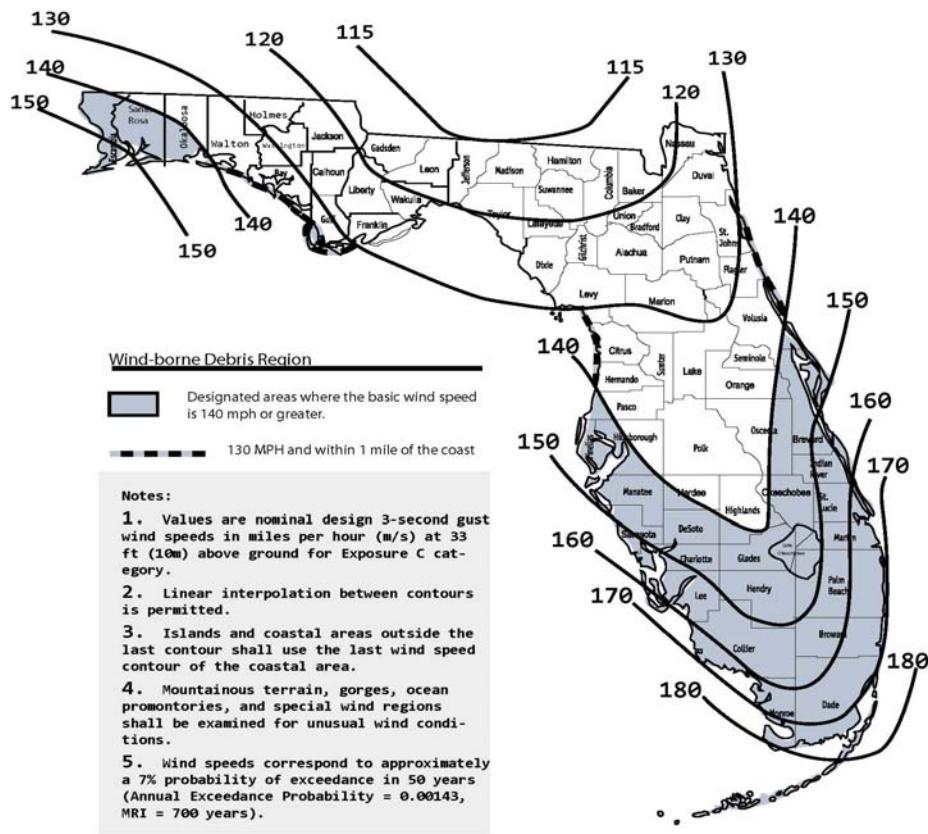


Figure R301.2(4) Ultimate Design Wind Speeds, V_{ult}

R301.2.1.1 Design Criteria

For structures located where the ultimate design wind speed is equal to or exceeds 115 mph, the design of the buildings shall be according to the following methods:

1. American Forest and Paper Association (AF&PA) Wood Frame Construction Manual for One- and Two-Family Dwellings (WFCM)
2. International Code Council Standard for Residential Construction in High Wind Regions (ICC-600)
3. Minimum Design Loads for Buildings and Other Structures (ASCE-7)

4. American Iron and Steel Institute (AISI), Standard for Cold-Formed Steel Framing—Prescriptive Method for One- and Two-family Dwellings (AISI 230)
5. Concrete construction shall be designed in accordance with this code
6. The MAF Guide to Concrete Masonry Residential Construction in High Wind Areas shall be permitted for applicable concrete masonry buildings where V_{asd} determined in accordance with section R301.2.1.3 does not exceed 130 mph (58 m/s) in Exposure B and 110 mph (49 m/s) in Exposure C in accordance with Figure R301.2(4)
7. The applicable AF&PA Guide to Wood Construction in High Wind Areas shall be permitted for applicable wood-frame buildings in regions where V_{asd} determined in accordance with section R301.2.1.3 does not exceed 130 mph (58 m/s) in Exposure B
8. Structural insulated panel (SIP) walls shall be designed in accordance with the provisions of this code.

R301.2.1.2 Protection of Openings

If the site is in a wind borne debris region, the windows and doors must have glazed openings protected from windborne debris. Glazed opening protection for windborne debris must meet the requirements of the Large Missile Test of ASTM E 1996 and of ASTM E 1886, SSTD 12, or TAS 201, 202 and 203, or AAMA 506. Garage doors must meet ANSI/DASMA 115. The building products must be tested according to these standards and pass the test. They must be able to resist breaking from not only the force of the wind itself but also from flying debris. The ASTM standard 1996 tests window glass and exterior door material for performance withstanding windborne debris in hurricanes. ASTM standard 1886 is similar; however it further tests exterior materials, including hurricane shutters when flying materials such as a wood beams become like high powered projected missiles and the exterior windows, doors, or shutters are under different air pressure caused by hurricane force winds.

There is an exception for one and two story buildings to allow wood structural panels to protect openings in wind borne debris areas. The wood structural panels shall be a minimum thickness of 7/16 inch (11.1 mm) and a maximum span of 8 feet (2438 mm) Panels shall be precut so that they shall be attached to the framing surrounding the opening containing the product with the glazed openings. Panels shall be predrilled as required for the anchorage method and all required hardware shall be provided.

R301.2.1.1.1 Design

The design guide AAF Guide to Aluminum shall be accepted as accepted engineering practices.

R302 Fire Resistant Construction

Structures on adjoining lots can influence a new dwelling unit, therefore the code requires a fire separation distance to be maintained. Table R302.1 Exterior Walls contain the requirements for fire separation distance for walls, projections, and openings in walls and penetrations. If the walls of residential structures are separated by less than three feet, the exterior walls that run parallel to each other must be one-hour fire rated construction. Projections such as roof overhangs or bay windows must be three feet apart unless fire rated, in which case the separation is only required to be two feet apart. Openings in walls are not allowed when the walls have less than three feet of fire separation distance.

Exceptions to complying with R302.1 are:

1. Walls, projections, openings, or penetrations in walls perpendicular to the line used to determine the fire separation distance.
2. Walls of dwellings and accessory structures located on the same lot.
3. Detached tool sheds and storage sheds, playhouses, and similar structures exempted from permits are not required to provide wall

protection based on location on the lot. Projections beyond the exterior wall shall not extend over the lot line.

4. Detached garages accessory to a dwelling located within two feet (610 mm) of a lot line are permitted to have roof eave projections not exceeding four inches (102 mm).
5. Foundation vents installed in compliance with this code are permitted.
6. Openings and roof overhang projections shall be permitted on a zero lot line when the building exterior wall is separated from an adjacent building exterior wall by a distance of six feet or more, and the roof overhang projection is separated by an adjacent building projection by a distance of four feet or more, with one hour fire resistant construction on the underside of the overhang required, unless the separation of the projections is six feet or more.
7. Screen enclosure walls of insect screening with a maximum of 25% solid flexible finishes.

T302.1 Exterior Walls

Exterior Wall Element		Minimum Fire Resistance Rating	Minimum Fire Separation Distance
Walls	(Fire-resistance rated)	1 hour-tested in accordance with ASTM E 119 or UL 263 with exposure from both sides	0 feet
	(Not fire-resistance rated)	0 hours	3 feet
Projections	(Fire-resistance rated)	1 hour on the underside	2 feet
	(Not fire-resistance rated)	0 hours	3 feet
Openings in walls	Not allowed	N/A	N/A
	Unlimited	0 hours	3 feet
Penetrations	All	Comply with Section R302.4	< 3 feet
		None required	3 feet

R302.2 Townhouses

Townhouses are considered separate buildings and the exterior walls shall be fire resistant construction as required in Table R302.1. Instead of

providing two one-hour fire rated walls, a two-hour fire rated common wall may be provided. Plumbing and mechanical equipment is prohibited in the wall. The wall shall be rated for fire exposure on both sides. Electrical shall be installed in accordance with Chapter 34.

R302.3 Two family Dwellings Fire Separation

Two dwellings in a single building shall be separated by one-hour fire resistant construction. If the building is fire sprinklered the rating may be reduced to ½ hour fire separation.

R302.5 and R302.6 Dwelling Garage Separation and Opening Protection

The garage shall be separated from the dwelling unit in accordance with Table R302.6.

TABLE R302.6 DWELLING/GARAGE SEPARATION	
SEPARATION	MATERIAL
From the residence and attics	Not less than 1/2-inch gypsum board or equivalent applied to the garage side
From all habitable rooms above the garage	Not less than 5/8-inch Type X gypsum board or equivalent
Structure(s) supporting floor/ceiling assemblies used for separation required by this section	Not less than 1/2-inch gypsum board or equivalent
Garages located less than 3 feet from a dwelling unit on the same lot	Not less than 1/2-inch gypsum board or equivalent applied to the interior side of exterior walls that are within this area

Openings from a private garage to a sleeping room are prohibited. Other openings between the garage and residence shall be a solid wood door 1 3/8 inches thick, solid or honeycomb core steel door 1 3/8 inches thick or a 20-minute fire rated door. Ducts penetrating the walls or ceilings separating the dwelling from the garage shall be constructed of a minimum No. 26 gauge (0.48 mm) sheet steel, one inch minimum rigid nonmetallic Class 0 or Class 1 duct board or other approved material, and openings are not permitted into the garage.

R302.7 Understair Protection

Space enclosed beneath a stair that is accessible shall be protected with $\frac{1}{2}$ inch gypsum board.

R303 Light, Ventilation and Heating

R303.3 requires that all bathrooms have a window that is a minimum of 3 square feet and one half of it must open. This allows natural daylight and ventilation that have been established as necessary for the health and welfare of building occupants.

R304 Minimum Room Areas

Room size and ceiling heights are requirements that were put in place for the health and well-being of occupants. Whole families used to live in very crowded conditions, which led to the spread of disease and poor sanitary conditions. To limit overcrowded conditions, minimum room sizes must be maintained. Habitable rooms must be maintained at not less than 70 square feet and at least one habitable room must be a minimum of 120 square feet. The only exception is kitchens. It should be noted that no room (except kitchens) can be less than seven feet in any direction. For example, a room can be at a minimum seven feet X 10 feet for a total square footage of 70. However, a room that is six feet X 12 feet is not acceptable even though it is 72 square feet.

Sloping ceiling in an area less than five feet horizontally, and furred ceiling less than seven feet may not be considered habitable area.

R305 Ceiling Height

Habitable space, hallways, bathrooms, toilet rooms, laundry rooms, and portions of basements (with hallways, bathrooms, and laundry rooms) shall have a ceiling height of not less than seven feet. Exceptions include rooms with sloped ceilings. At least 50 percent of the required floor area of the room must have a ceiling height of at least seven feet and no portion of the required floor area may have a ceiling height of less than five feet. Bathrooms shall have a minimum

ceiling height of six feet eight inches at the center of the front clearance area for fixtures as shown in Figure R307.1. The ceiling height above fixtures shall be adequate for the fixture to be used for its intended purpose. A shower or tub equipped with a showerhead shall have a minimum ceiling height of six feet eight inches above a 30 X 30 inch area at the showerhead.

R307 Toilet, Bath & Shower Spaces

Minimum space shall be provided around toilet fixtures in accordance with Figure R307.1

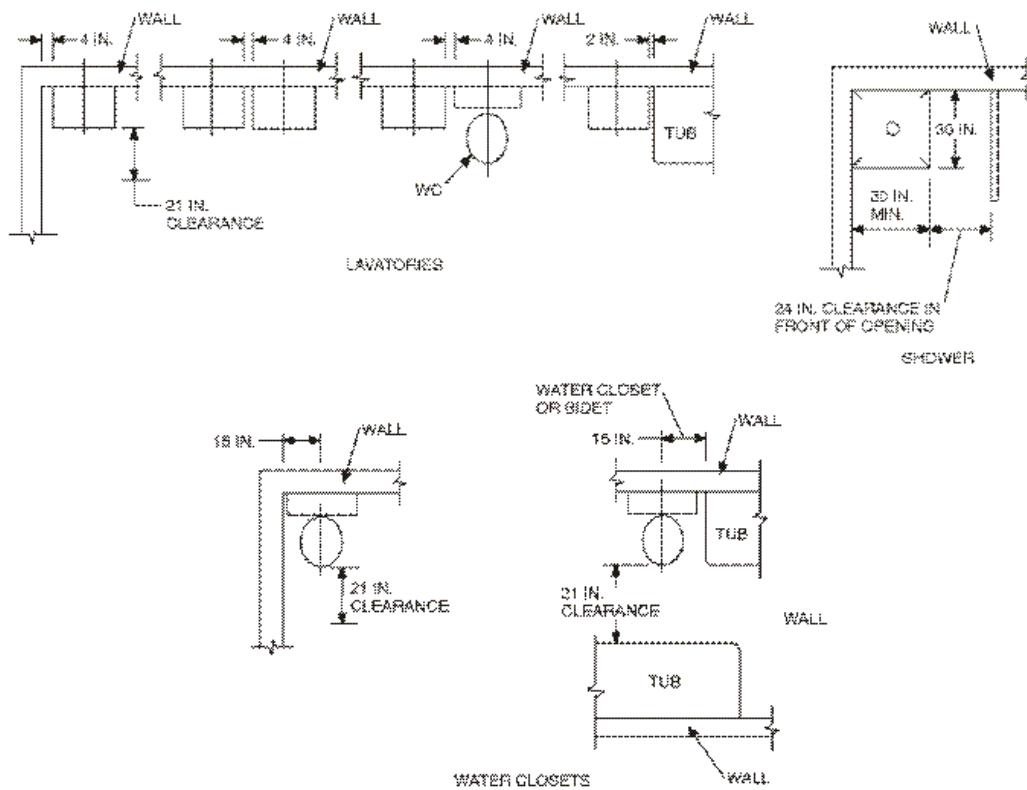


FIGURE R 307.1
MINIMUM FIXTURE CLEARANCES

The floor and walls of a bathtub or shower shall be finished with nonabsorbent material and shall extend at least six feet above the finished floor.

R308 Glazing

Glazing used in the following applications and/or locations is considered hazardous and must be a type of safety glazing per R308.4:

- Glazing in all swinging doors, sliding doors and bi-fold closet doors
- Glazing adjacent to a door
- Glazing in an individual fixed or operable panel that meets the following requirements:
 - Individual pane within window assembly that exceeds nine sq. ft.
 - Glazing that starts at 18 inches A.F.F.
 - Top of glazing is greater than 36 inches A.F.F.
 - Glazing that is 36 inches horizontally within a walking surface
- Glazing in railings
- Glazing in enclosures for showers, tubs, steam rooms, hot tubs, whirlpools, and saunas
- Glazing near pools
- Glazing adjacent to stairs, landings, and ramps within 36" of a walking surface
- Glazing adjacent to stairs within 60" of the bottom tread when the glazing is less than 60" above the nose of the tread

It is considered safety glass when the glass does not break or shatter into thousands of very small pieces, which keeps the occupant from coming into contact with shards of glass that are hazardous. This is used in areas where people might fall against the glass. Except as indicated in Section R308.1.1, each pane of glazing installed in a hazardous location must have a manufacturer's or installer's label visible in the final installation designating the type and thickness of glass and the safety glazing standard with which it complies. The safety glazing label must be acid etched, sandblasted, ceramic-fired, embossed mark, or of a type which once applied cannot be removed without being destroyed.

R309 Garages and Carports

The garage floor shall be a non-combustible material (usually concrete) and the floor must slope either towards a drain or towards the garage door so that any fluids leaking from the car will be moved away from the habitable part of the house.

R310 Emergency Escape and Rescue Openings

Basements, habitable attics and every sleeping room must have an emergency escape and rescue opening. Emergency escape and rescue requirements were put in place to aid in the ability of occupants to escape the structure if there is a fire when the occupants may not be aware a fire is in the structure, such as sleeping. By the time an occupant is aware of a fire, it may not be safe to travel through the structure to an exit door, therefore these emergency escape and rescue openings provide a means to escape the burning structure. Openings for emergency escape must be a minimum of 20 inches wide and 24 inches high with a net clear opening of 5.7 sq ft; at grade these openings can be 5 sq ft. The sill height shall not exceed 44 inches above the finished floor. Escape windows must have the ability to be opened from the inside and cannot be obstructed by bars, grills, or other coverings. Doors may open into a screened area open to the atmosphere that has an exterior door.

R311 Means of Egress

Section R311 details construction requirements for the means of egress elements in a residential structure. The means of egress shall provide a continuous and unobstructed path of vertical and horizontal egress travel from all portions of the dwelling to the exterior of the dwelling at the required egress door without requiring travel through a garage. This includes doors, stairways, ramps, exterior exit balconies, hallways, and doors.

Every dwelling unit must have at least one exterior door that is side hinged and a minimum of 32 inches wide. This door is considered the primary exit. Other exterior doors can be hinged, sliding, or another type of door. Additionally,

the floor on both the interior and exterior sides of any door must have a level landing that is at least 36 inches wide. Egress doors shall be readily openable from inside the dwelling without the use of a key or special knowledge or effort. There shall be a landing on each side of the door. The landing at an exterior door is permissible to be no more than 7 $\frac{3}{4}$ inches below the top of the threshold provided the door does not swing over the landing.

Hallways shall be a minimum of 36 inches wide.

Stairways shall be a minimum of 36 inches wide and shall be provided with a minimum head room height (ceiling height) of six feet eight inches above the leading edge of the tread.

Treads and risers shall meet the following requirements:

- Risers:
 - Maximum riser height is 7 $\frac{3}{4}$ inch
 - Greatest riser height should not exceed the smallest by more than 3/8 inch
- Treads:
 - Minimum tread depth 10 inches
 - Greatest tread depth should not exceed the smallest by more than 3/8 inch
 - A nosing not less than $\frac{3}{4}$ inch and no greater than 1 $\frac{1}{4}$ inch shall be provided on solid risers; beveling shall not exceed $\frac{1}{2}$ inch.
Exception: a nosing is not required when the tread depth is a minimum of 11 inches

Handrails shall be provided on at least one side where the flight is four or more risers. Handrails shall be mounted between 34 and 38 inches above the tread

The area under the stairs must be protected with $\frac{1}{2}$ inch gypsum board providing a $\frac{1}{2}$ hour fire rating.

Ramps shall meet the following requirements: The maximum slope for a ramp is a 1:12 ratio; meaning for every 1 inch the ramp rises there must be 12 inches of straight run. Where it is technically infeasible to comply because of site

constraints, ramps may have a maximum slope of one unit vertical in eight horizontal (12.5 percent slope). Landings shall be provided at the top, bottom, where a door opens onto the ramp, and where the ramp changes direction. The landing shall be three feet x three feet. Handrails shall be provided on one side of the ramp at a height of not less than 34 to 38 inches above the ramp surface. Handrails shall be continuous along the ramp.

R312 Guards

Guard rails are required for porches, balconies, and raised floors 30 inches or more in height. Guard rails must not be less than 36 inches in height.

R314 Smoke Alarms

Residential dwelling units are required to have smoke alarms in the following locations:

1. In each sleeping room.
2. Outside each separate sleeping area in the immediate vicinity of the bedrooms.
3. On each additional story of the dwelling, including basements and habitable attics but not including crawl spaces and uninhabitable attics. In dwellings or dwelling units with split levels and without an intervening door between the adjacent levels, a smoke alarm installed on the upper level shall suffice for the adjacent lower level provided that the lower level is less than one full story below the upper level.

When more than one smoke alarm is required to be installed within an individual dwelling unit, the alarm devices shall be interconnected in such a manner that the actuation of one alarm will activate all of the alarms in the individual unit.

When alterations, repairs, or additions are done to the dwelling unit that require a permit, smoke alarms shall be installed as required for new dwellings.

R315 Carbon Monoxide Alarms

This section is new to the FBCR. Carbon monoxide alarms are required in all new dwelling units and in additions to existing dwelling units where there is a fossil fuel appliance, a fireplace, an attached garage, or another element that emits carbon monoxide as a byproduct of combustion. The alarm shall be installed within 10 feet of each room used for sleeping purposes. The carbon monoxide alarm shall be one of the following:

1. A hard wired carbon monoxide alarm
2. A battery powered carbon monoxide alarm
3. A hard wired combination carbon monoxide and smoke alarm
4. A battery powered combination carbon monoxide and smoke alarm

R316 Foam Plastic

Foam plastic insulation shall be labeled by an approved agency. The label shall include the manufacturer's name, product listing, product identification, and information to determine that the end use will comply with the requirements of this section. All foam plastic and foam plastic cores shall have a flamespread index of not more than 75 and shall have a smoke developed index of not more than 450.

Foam plastic is required to be separated from the interior of a building by an approved thermal barrier of minimum 1/2 inch gypsum wallboard or an approved finish material equivalent to a thermal barrier material. See this section for additional requirements for thermal barriers in attics and crawl spaces.

R317 Protection of Wood and Wood Based Products Against Decay

Protection of wood and wood based products from decay shall be achieved by the use of naturally durable wood or wood that is preservative-treated in accordance with AWPA U1 for the species. This protection shall be provided in the following locations:

1. Wood joists or the bottom of a wood structural floor when closer than 18 inches or wood girders when closer than 12 inches to the exposed ground

in crawl spaces or unexcavated area located within the periphery of the building foundation.

2. All wood framing members that rest on concrete or masonry exterior foundation walls and are less than 8 inches from the exposed ground.
3. Sills and sleepers on a concrete or masonry slab that is in direct contact with the ground unless separated from such slab by an impervious moisture barrier.
4. The ends of wood girders entering exterior masonry or concrete walls having clearances of less than 1/2 inch on tops, sides and ends.
5. Wood siding, sheathing, and wall framing on the exterior of a building having a clearance of less than six inches from the ground or less than two inches measured vertically from concrete steps, porch slabs, patio slabs, and similar horizontal surfaces exposed to the weather.
6. Wood structural members supporting moisture-permeable floors or roofs that are exposed to the weather, such as concrete or masonry slabs, unless separated from such floors or roofs by an impervious moisture barrier.
7. Wood furring strips or other wood framing members attached directly to the interior of exterior masonry walls or concrete walls below grade except where an approved vapor retarder is applied between the wall and the furring strips or framing members.

Lumber and plywood required to be pressure-preserved-treated shall bear the quality mark of an approved inspection agency that has been approved by an accreditation body that complies with the requirements of the American Lumber Standard Committee treated wood program. The required quality mark shall be on each piece of pressure-preserved-treated lumber or plywood shall contain the following information:

1. Identification of the treating plant.
2. Type of preservative.

3. The minimum preservative retention.
4. End use for which the product was treated.
5. Standard to which the product was treated.
6. Identity of the approved inspection agency.
7. The designation "Dry," if applicable.

Fasteners in contact with preservative-treated wood and fire-retardant-treated wood shall be zinc-coated fasteners in accordance with ASTM A 153. Fasteners for preservative-treated wood shall be of hot dipped zinc-coated galvanized steel, stainless steel, silicon bronze, or copper in accordance with manufacturers' recommendations.

R318 Protection Against Termites

Termite protection shall be provided by registered termiticides. These shall include soil applied pesticides, baiting systems and pesticides applied to wood, or other approved methods of termite protection labeled for use as a preventative treatment to new construction. Once the application of the termite protective treatment is complete, a Certificate of Compliance shall be issued to the building department by the licensed pest control company that contains the following statement: "The building has received a complete treatment for the prevention of subterranean termites. Treatment is in accordance with rules and laws established by the Florida Department of Agriculture and Consumer Services."

R319 Site Address

Buildings shall have approved address numbers, building numbers or approved building identification in a position that is plainly legible and visible from the street or road fronting the property. These numbers shall contrast with their background. Address numbers shall be Arabic numbers or alphabetical letters. Numbers shall be a minimum of 4 inches (102 mm) high with a minimum stroke width of 1/2 inch (12.7 mm). Where access is by means of a private road and the

building address cannot be viewed from the public way, a monument, pole or other sign or means shall be used to identify the structure.

R320 Accessibility

There is a need for accessible housing to accommodate our aging population as they begin to lose some physical abilities and may need to use a wheel chair. The Florida Building Code, Residential attempts to address the current and future needs of an aging population.

Newly constructed residential housing must have a bathroom on the ground floor with a door no less than 29 inches wide. It should be noted that this allows a wheelchair to be pushed through the door but does not allow comfortable maneuvering space for someone to wheel through the door on their own. In order to provide a door wide enough for an individual to push themselves through without hitting elbows and scraping fingers, a clear width opening of 32 inches is recommended for doors and door openings. As the base age of the majority of the population shifts towards an older population, meeting not only the codes but the recommended standards will become increasingly important.

R322 Flood Resistant Construction

Section R322 provides requirements for construction of dwelling units in flood hazard areas. These requirements include construction in "A" or "V" zones, design flood elevations, protection of mechanical systems, electrical systems, water supply, sanitary sewage systems, flood resistant materials, structures seaward of the coastal construction line, enclosed areas below design flood elevations, foundation design and construction, pools located in floodways, and coastal high hazard areas,

CHAPTER 4

FOUNDATIONS

Chapter 4 of the Florida Residential Code regulates design and construction of foundations. Foundations shall be capable of accommodating all gravity loads and transmitting these loads to the supporting soil. Foundations shall also be capable of resisting all loads from roof uplift and overturning. Table R401.4.1 provides acceptable values of soil for load bearing purposes.

Chapter 4 contains requirements for compressive strength of concrete for foundations, minimum size of foundations, minimum depth of foundations, foundation uplift design, foundation walls and retaining walls, foundation drainage, and foundation waterproofing and dampproofing. Table R401.4.1 contains load bearing values for soil conditions.

**TABLE R401.4.1
PRESUMPTIVE LOAD-BEARING VALUES
OF FOUNDATION MATERIALS ^a**

CLASS OF MATERIAL	LOAD-BEARING PRESSURE (PSF)
Crystalline bedrock	12,000
Sedimentary and foliated rock	4,000
Sandy gravel and/or gravel (GW and GP)	3,000
Sand, silty sand, clayey sand, silty gravel and clayey gravel (SW, SP, SM, SC, GM, and GC)	2,000
Clay, sandy clay, silty clay, clayey silt, silt and sandy silt (CI, ML, MH, and CH)	1,500 ^b
<ul style="list-style-type: none">a. When soil tests are required by section R4011.4, the allowable bearing capacities of the soil shall be part of the recommendations.b. Where the building official determines that in-place soils with an allowable bearing capacity of less than 1,500 psf are likely to be present at the site, the allowable bearing capacity shall be determined by a soils investigation.	

Concrete foundations must meet the specifications outlined in Table R402.2 for compressive strength in order to insure that the foundation can support the structure and live loads of a residential structure. The width of the footing is regulated by Table 403.1. Footings must be a minimum of 12 inches below grade.

TABLE R402.2 MINIMUM SPECIFIED COMPRESSIVE STRENGTH OF CONCRETE			
TYPE OR LOCATION OF CONCRETE CONSTRUCTION	MINIMUM SPECIFIED COMPRESSIVE STRENGTH^a (f'c)		
	Weathering Potential^b		
	Negligible	Moderate	Severe
Basement walls, foundations and other concrete not exposed to the weather	2,500	2,500	2,500 ^c
Basement slabs and interior slabs on grade, except garage floor slabs	2,500	2,500	2,500 ^c
Basement walls, foundation walls, exterior walls and other vertical concrete work exposed to the weather	2,500	3,000 ^d	3,000 ^d
Porches, carport slabs and steps exposed to the weather, and garage floor slabs	2,500	3,000 ^{d,e,f}	3,500 ^{d,e,f}

For SI: 1 pound per square inch = 6.895 kPa.

a. Strength at 28 days psi.

b. See Table R301.2(1) for weathering potential.

c. Concrete in these locations that may be subject to freezing and thawing during construction shall be air-entrained concrete in accordance with Footnote d.

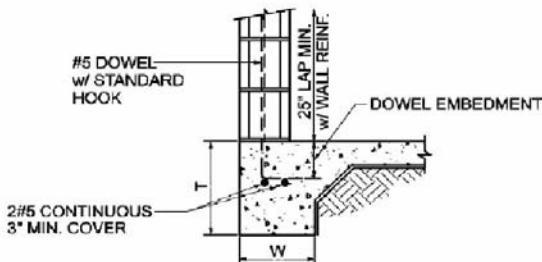
d. Concrete shall be air-entrained. Total air content (percent by volume of concrete) shall be not less than 5 percent or more than 7 percent.

e. See Section R402.2 for maximum cementitious materials content.

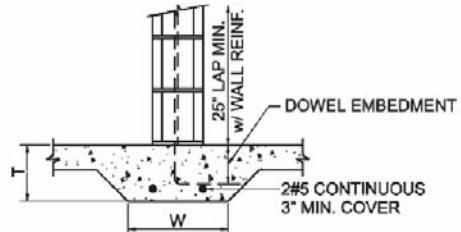
f. For garage floors with a steel troweled finish, reduction of the total air content (percent by volume of concrete) to not less than 3 percent is permitted if the specified compressive strength of the concrete is increased to not less than 4,000 psi.

TABLE R403.1 MINIMUM WIDTH OF CONCRETE, PRECAST OR MASONRY FOOTINGS (inches)				
	LOAD-BEARING VALUE OF SOIL (psf)			
	1,500	2,000	3,000	4,000
Conventional light-frame construction				
1-story	12	12	12	12
2-story	15	12	12	12
3-story	23	17	12	12
4-inch brick veneer over light frame or 8-inch hollow concrete masonry				
1-story	12	12	12	12
2-story	21	16	12	12
3-story	32	24	16	12
8-inch solid or fully grouted masonry				
1-story	16	12	12	12
2-story	29	21	14	12
3-story	42	32	21	16

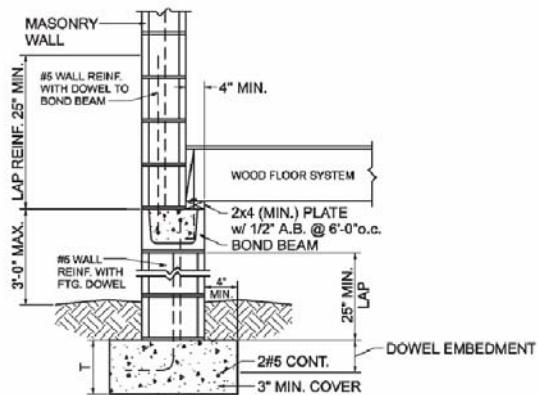
Section 403 gives specific details and specifications on the construction of concrete and masonry foundations. Here are some examples of the details included in this section.



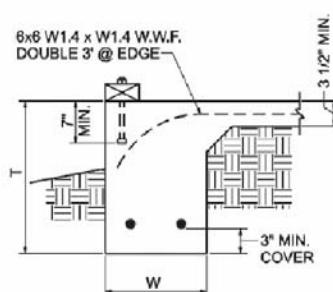
FOOTING A
MONOLITHIC SLAB-ON-GRADE EXTERIOR WALL



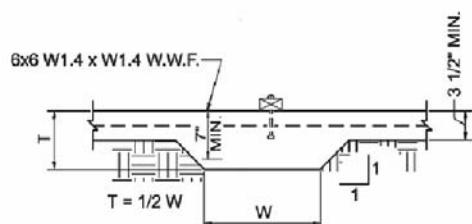
FOOTING B
MONOLITHIC SLAB-ON-GRADE INTERIOR WALL



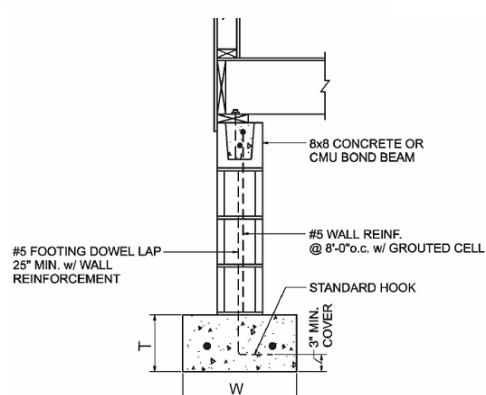
FOOTING C
STEM WALL WOOD JOIST FLOOR



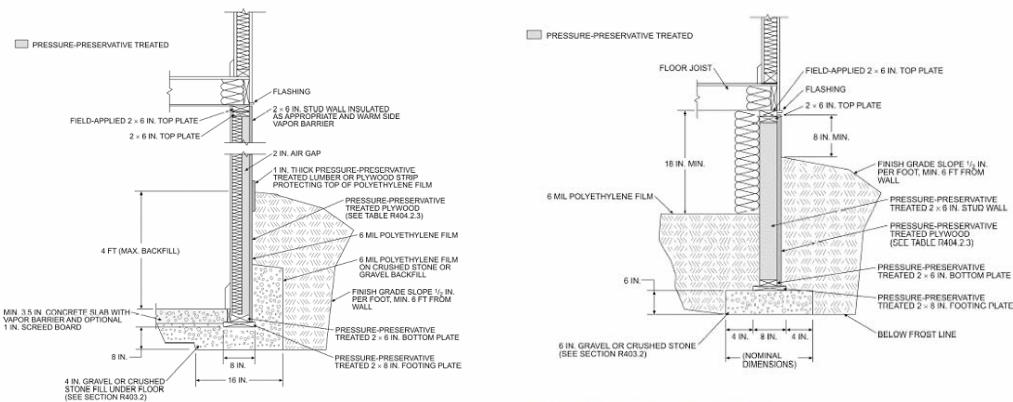
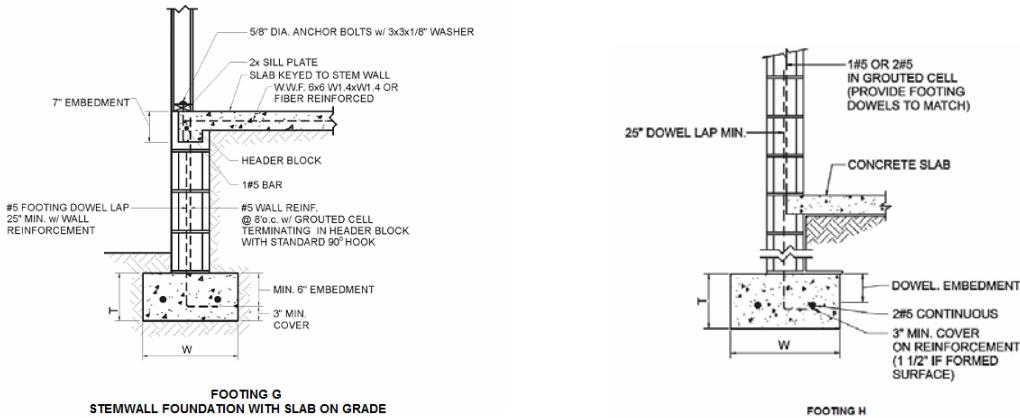
FOOTING D
MONOLITHIC EXTERIOR FOOTING



FOOTING E
MONOLITHIC INTERIOR FOOTING



FOOTING F
WOOD FLOOR TO CONCRETE OR MASONRY STEMWALL



Section 405 contains the requirements for foundation drainage. Building lots shall be graded to drain away from foundations. The grade shall fall a minimum of six inches within the first 10 feet. Table R405.1 describes the characteristics of soils according to the unified soil classification system.

Table R405.1
PROPERTIES OF SOILS
CLASSIFIED ACCORDING TO THE UNIFIED SOIL CLASSIFICATION SYSTEM

SOIL GROUP	UNIFIED SOIL CLASSIFICATION SYSTEM SYMBOL	SOIL DESCRIPTION	DRAINAGE CHARACTERISTICS ^a	FROST HEAVE POTENTIAL	VOLUME CHANGE POTENTIAL EXPANSION ^b
Group I	GW	Well-graded gravels, gravel sand mixtures, little or no fines.	Good	Low	Low
	GP	Poorly-graded gravels or gravel sand mixtures, little or no fines.	Good	Low	Low
	SW	Well-graded sands, gravelly sands, little or no fines.	Good	Low	Low
	SP	Poorly-graded sands or gravelly sands, little or no fines.	Good	Low	Low
	GM	Silty gravels, gravel-sand-silt mixtures.	Good	Medium	Low
	SM	Silty sand, sand-silt mixtures.	Good	Medium	Low
Group II	GC	Clayey gravels, gravel-sand-clay mixtures.	Medium	Medium	Low
	SC	Clayey sands, sand-clay mixture.	Medium	Medium	Low
	ML	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.	Medium	High	Low
	CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.	Medium	Medium	Medium to Low
Group III	CH	Inorganic clays of high plasticity, fat clays.	Poor	Medium	High
	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.	Poor	High	High
Group IV	OL	Organic silts and organic silty clays of low plasticity.	Poor	Medium	Medium
	OH	Organic clays of medium to high plasticity, organic silts.	Unsatisfactory	Medium	High
	Pt	Peat and other highly organic soils.	Unsatisfactory	Medium	High

CHAPTER 5

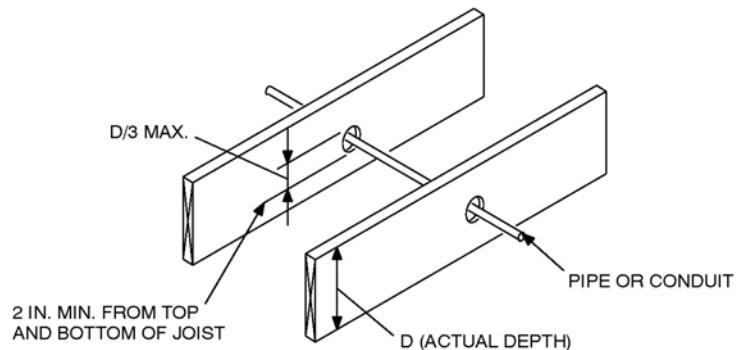
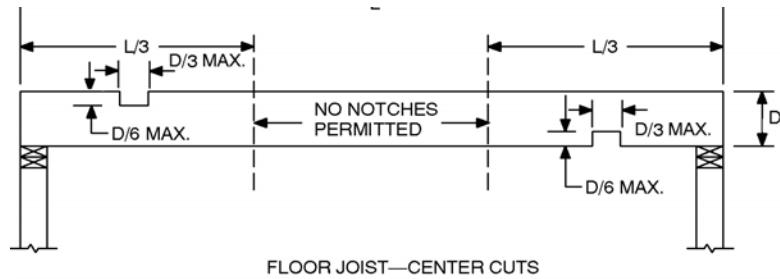
FLOORS

Chapter 5 regulates design and construction of all floors including attic spaces that house mechanical/plumbing; however housing in the High Velocity Wind Zone must comply with Chapter R44. Floor construction must be capable of accommodating and distributing loads.

Section 502 contains the requirements for wood floor framing, including wood trusses. Floor framing of light frame wood construction shall be designed and constructed in accordance with R301.2.1.1 or AF&PA NDS. Truss design drawings shall be submitted to the Building Department and approved prior to installation. Truss engineering shall include:

1. slope or depth, span, and spacing;
2. location of all joints;
3. required bearing widths;
4. design loads including top chord live load and dead load, bottom chord live load and dead load, concentrated loads and their points of application;
5. adjustments to lumber and joint connector design values for condition of use;
6. each reaction force and direction;
7. joint connector type and description;
8. lumber size, species and grade for each member;
9. connection requirements for truss to girder truss, truss ply to ply, and field splices;
10. calculated deflection ratio and/or maximum description for live and total load;
11. maximum axial compression forces in the truss members;
12. required permanent truss member bracing location.

Section 502 also contains requirements for drilling and notching of wood structural members.



Section 503 covers floor sheathing, 504 covers pressure preservatively-treated wood floors on grade and 506 covers concrete floors on ground. A concrete slab-on-grade must be a minimum of 3.5 inches thick and a six mil thickness vapor barrier placed between the concrete slab and the subgrade.

CHAPTER 6

WALL CONSTRUCTION

Chapter 6 of the Florida Building Code, Residential contains the provisions for walls and partitions in buildings constructed under this code.

- Section R602 regulates wood framing
- Section R604 regulates wood structural panels
- Section R605 regulates particleboard
- Section R606 through R610 regulates masonry construction
- Section R611 regulates exterior concrete wall construction
- Section R612 regulates exterior windows and doors
- Section R613 regulates structural insulated wall panels
- Section R614 regulates combined concrete, masonry, or ICF and wood exterior wall construction
- Section R615 regulates impact resistance coverings
- Section R616 regulates soffit construction

Many sections are reserved because of the incorporation of ASCE 7 – 2010 into the code as well as the use of design guidelines permitted by R301.2.1.1.

Cutting or notching into a wood exterior or bearing wood stud is allowed if the cut or notch does not exceed 25% of the stud width. Nonbearing studs may be notched not to exceed 40% of the single stud width. Boring and drilling may be done to any stud as long as the resulting hole does not exceed 60% of the stud width and the hole is no closer than 5/8 inch away from the edge of the stud. These requirements are put in place to ensure the wall's ability to support the required load and maintain its structural integrity, even when drilling is necessary for other elements. When exterior walls or load bearing interior walls are drilled over 40% but less than 60% of the stud width, the stud shall be doubled with no more than two successive doubled studs bored. When exterior wall or interior load bearing wall is drilled in top plate more than 50% of the width, a galvanized metal tie not less than 0.054 inch thick and 11/2 inches wide shall be fastened across and to the plate at each side of the opening. The metal tie must extend a minimum of six inches past the opening.

Fire blocking shall be provided in accordance with R302.11.

Exterior windows and doors shall be designed to resist the design loads specified in Table 301.2.2. They shall be tested in an approved independent testing laboratory and labeled to demonstrate compliance with ANSI/AAMA/NWWDA101/I.S.2 or ANSI/AAMA/WDMA101/I.S.2 101/I.S.2/NAFS or AAMA/WDMA/CSA 101/I.S.2/A440 or TAS 202 (HVHZ shall comply with TAS 202 utilizing ASTM E 1300-98 or ASTM E 1300-04 02). Exterior windows and doors shall be labeled with a permanent label with the manufacturer and product. Other labels shall contain the product model series, positive and negative wind pressure rating, product maximum size, glazing thickness, and impact resistance. The label shall also identify the standard to which it was tested, the approval number, and the testing lab.

Impact-resistant coverings shall be tested at 1.5 times the design pressure (positive or negative) in pounds per square feet as determined by Section 1609 of the Florida Building Code, Building. Impact-resistant coverings shall be labeled in accordance with the provisions of Section R615.2. The label shall include the following:

1. Product approval holder name and address.
2. All applicable methods of approval. Methods of approval include, but, are not limited to Miami-Dade NOA; Florida Building Commission, TDI Product Evaluation; ICC-ES.
3. The test standard or standards specified in Section R301.2.1.2, including standards referenced within the test standards specified in Section R301.2.1.2 used to demonstrate code compliance.
4. For products with a Florida Product Approval Number or a Miami-Dade County Building Code Compliance Office Notice of Acceptance Number (NOA), such numbers shall be included on the label.

The installation of impact-resistant coverings shall be in accordance with the manufacturer's installation instructions and product approval.

CHAPTER 7

WALL COVERING

This chapter includes both interior and exterior wall coverings. Exterior walls on all residential structures must be weather resistant, which the code refers to as a “weather-resistant exterior wall envelope.” The weather-resistant envelope has to be constructed in a manner that prevents the accumulation of water in the wall cavity, which includes the use of flashing as described in Section R703.2. The exterior wall assembly shall be protected from condensation. Wall coverings, their backing materials and attachments shall be capable of resisting wind loads in accordance with Tables R301.2(2) and R301.2(3).

When the exterior wall has some type of stone or brick (masonry) veneer that is applied to the outside face of the exterior wall, the veneer is only to be used for aesthetic purposes and is prohibited from supporting any load other than the dead load of the veneer.

This chapter covers the following sections for exterior wall coverings:

- R703.3 Wood, hardboard and wood structural panel siding
- R703.5 Wood shakes and shingles
- R703.6 Exterior plaster
- R703.7 Stone and masonry veneer, general
- R703.8 Flashing.
- R703.9 Exterior insulation and finish system (EIFS)/EIFS with drainage
- R703.10 Fiber cement siding
- R703.11 Vinyl siding
- R703.12 Adhered masonry veneer installation
- R703.13 Metal veneers

Section R704 Inspection for Termites is a Florida-specific amendment. In order to provide for inspection for termite infestation, clearance between exterior

wall coverings and final earth grade on the exterior of a building shall not be less than six inches.

Exceptions:

1. Paint or decorative cementitious finish less than 5/8 inch (17.1 mm) thick adhered directly to the masonry foundation sidewall.
2. Access or vehicle ramps which rise to the interior finish floor elevation for the width of such ramps only.
3. A 4-inch (102 mm) inspection space above patio and garage slabs and entry areas.
4. If the patio has been soil treated for termites, the finish elevation may match the building interior finish floor elevations on masonry construction only.
5. Masonry veneers.

CHAPTER 8

ROOF CEILING

Chapter 8 of the Florida Building Code, Residential regulates the construction of roof ceiling assemblies. The construction of roof ceiling assemblies shall be capable of accommodating and transmitting all loads to the supporting structure. Chapter 8 covers wood roof framing, roof sheathing, roof ventilation, attic access, and ceiling finishes.

Ceiling materials are regulated like interior wall finishes and typically are 1/2 inch gypsum board. When installing lighting fixtures that generate heat in the ceiling such as recessed down lights, insulation cannot come within 3 inches of the recessed part of the lighting fixture unless listed for less.

Additional regulations exist for the manner in which roof-ceilings are to be fastened to the overall structure.

CHAPTER 9

ROOF ASSEMBLIES

Chapter 9 of the Florida Residential Code regulates the roof assemblies. It includes roof coverings, flashing, coping, roof drainage, and roof insulation. Reroofing shall comply with the Florida Building Code, Existing.

Section R902 covers roof classifications. Roof assemblies are classified as A, B, or C for fire resistance. Additionally, section 903 covers weather resistant construction, in particular, water resistant materials and construction of roof assemblies. A weather resistant roof protects the structure from long term damage such as mold and deterioration. The proper use of flashing in roof valleys and adequate drainage will minimize the chance of water entering any part of the structure from the roof. Section 904 contains the requirements for roof coverings.

CHAPTER 10

CHIMNEYS AND FIREPLACES

Masonry chimneys must be designed and constructed to support their own weight. If any part of the chimney is intended to support any part of a roof or wall assembly, it must be designed for the additional weight. If the walls that come in direct contact with a fireplace and chimney are of brick (masonry) or concrete, the fireplace and chimney walls can be part of the wall assembly. The chimney and fireplace must be separated from combustible construction by 2 inches. The hearth shall be a non-combustible finish and distinguished somehow from the surrounding finish flooring such as a different color.

Chimneys also have height requirements. First they must be constructed so that they are at least two feet above any part of the roof within 10 feet of the chimney, and 3 feet above the highest point where the chimney passes through the roof.

CHAPTER 11

ENERGY EFFICIENCY

In the past, Florida had its own home grown energy code. The Florida Energy Code is now based on the International Energy Efficiency Code. The energy requirements for residential construction are contained in the Florida Building Code, Energy Conservation.

CHAPTER 13

GENERAL MECHANICAL SYSTEM REQUIREMENTS

The mechanical requirements of residential buildings are contained in Chapters 12 through 24. The General Mechanical Systems requirements cover installations that are not contained in other chapters. Sections in this chapter include labeling of appliances, appliance access, clearances from combustible construction, appliance installation, and mechanical systems installation including drilling and notching and protection against physical damage.

Any space that houses an appliance such as a compartment or alcove must have access to the appliance. This must be an unobstructed passageway a minimum of 24 inches wide or large enough to remove largest appliance in the space.

Appliances in the attic require access by an unobstructed passageway. The opening shall be large enough to remove largest appliance, but not less than 30 inches high and 22 inches wide. The opening shall be no more than six feet long measured from the centerline of passageway to the appliance. The passageway shall have continuous solid flooring a minimum of 24 inches wide.

The General Mechanical Systems requirements regulate the space requirements for appliance repair or replacement after the house is built. When an appliance such as a furnace needs to be replaced, this space allows for the removal and installation of a new appliance. The same is true for any appliance, such as an air handler, that may be located in the attic.

Each appliance alcove, space, or room must be provided with lighting controlled by a light switch. The switch to the lighting fixture must be located at the opening to the space. Light switches must be installed according to NFPA 70.

CHAPTER 14

HEATING AND COOLING

Heating and cooling equipment and appliances shall be installed in accordance with the manufacturer's installation instructions. Heating and cooling equipment shall be sized in accordance with ACCA Manual S based on building loads calculated in accordance with ACCA Manual J or other approved heating and cooling calculation methodologies. When equipment is installed outdoors, it shall be listed and labeled for outdoor installation.

Chapter 14 covers heat pumps, central furnaces, refrigeration cooling equipment, radiant heating systems, duct heaters, vented floor and wall furnaces, heating and cooling equipment, evaporative cooling equipment, fireplace stoves, and masonry heaters.

CHAPTER 15

EXHAUST SYSTEMS

Mechanically exhausted air shall be discharged to the outdoors. Air shall not be exhausted into an attic, soffit, ridge vent, or crawl space.

Section M1502 Clothes dryers exhaust requires all dryer vents to exhaust directly to the outdoors, and the vents cannot have screens installed over them which could cause them to become clogged with lint and catch on fire. The duct leading from the dryer to the vent shall be four inches in diameter and a minimum

of 0.016 inch thick rigid metal duct and a smooth metal so lint and fibers do not get caught in the duct. Metal ducts can be up to 25 feet in length from the dryer to the termination of the vent on an exterior wall; however you must deduct five feet for a 90 degree turn and 2 ½ feet for a 45 degree turn. To exceed the maximum allowable length of dryer vents, a clothes dryer booster fan may be installed. The clothes dryer exhaust system must work independent of other systems and shall be installed according to the manufacturer's instructions.

Section M1503 Range hood exhaust requires ducts to vent range hoods to be constructed of galvanized steel, stainless steel, or copper and must be vented directly to the exterior. A range with a ductless hood is not required to exhaust to the exterior when installed in accordance with the manufacturer's installation instructions.

Bathroom and toilet rooms exhaust shall not be recirculated within a residence or to another dwelling unit and shall be exhausted directly to the outdoors. Bathroom and toilet room exhaust shall not discharge into an attic, crawl space, or other areas inside the building.

CHAPTER 16

DUCT SYSTEMS

Section M1601: Duct Construction requires duct systems serving heating, cooling and ventilation equipment to be fabricated in accordance with ACCA Manual D or other approved methods based on the following:

1. Calculation of the supply air for each room shall be based on the greater of the heating load or sensible cooling load for that room.
2. Duct size shall be determined by the supply air requirements of each room, the available static pressure and the total equivalent length of the various duct runs.

3. Friction loss data shall correspond to the type of material used in duct construction.

This chapter includes the duct installation, fastening, sealing, closure systems, mechanical attachments, fire blocking, plenums, and return air.

M1601.2.7 Penetration prohibited: Flexible air ducts shall not pass through fire-rated wall or ceiling assemblies (M1601.2.7). All ducts penetrating walls or ceilings separating a dwelling from the garage must be No. 26 gauge steel (R302.5.2).

Section M1601.4.10 Condensation requires ducts to be designed and installed to prevent formation of condensation on the exterior of the duct.

PLUMBING

Chapter 25 (Plumbing Administration), 26 (General Plumbing Requirements), and 27 (Plumbing Fixtures) regulate the installation of plumbing and subsequent inspection of the plumbing installation by the building department. Section P2503 requires the inspector to test all drainage systems before a home is inhabited. Section P2603.3 requires pipes within walls to be protected from corrosion and breakage.

CHAPTER 27

PLUMBING FIXTURES

Plumbing fixtures in Chapter 27 refers to bathroom fixtures, faucets, and fixture fittings. This includes showers, tubs, toilets, and bidets, along with sinks and lavatories.

Section P2705 regulates the installation of water closets, lavatories, and bidets. The centerline of water closets, lavatories, or bidets shall not be less than 15 inches from adjacent walls or partitions or closer than 30 inches center to

center between adjacent fixtures. There shall be at least 21 inches clearance in front of the water closet, bidet, or lavatory to any wall, fixture, or door. P2719.1 regulates waste outlets for floor drains. P2708.3 requires shower/tub faucets have limit stops which limits water temperature to a maximum of 120°F

Showers shall be lined with either sheet lead, sheet copper, plastic liner material that complies with ASTM D 4068 or D 4451, hot mopping, or sheet applied, load bearing bonded waterproof membranes that comply with ANSI A118.10. Showers on the first floor where the floor is 2" below the main floor slab and are poured intergrally with the adjoining floor do not have to be lined. Water-resistant materials are needed in shower areas to keep water from seeping into walls and under flooring, preventing water damage and mold growth.

CHAPTER 29

WATER SUPPLY AND DISTRIBUTION

Chapter 29 of the Florida Building Code, Plumbing regulates the water distribution and supply pipes and fittings for fixtures. It addresses the protection of the potable water supply system with different types of backflow prevention devices. It gives requirements for the sizing of the water supply and distribution lines. A new section has been added that give requirements for Dwelling Unit Fire Sprinkler Systems.

CHAPTERS 30, 31, AND 32

SANITARY DRAINAGE, VENTS, AND TRAPS

Chapters 30, 31, and 32 include regulations for sanitary drainage, vents, and traps. Chapter 30 gives the requirements for materials used in piping, joints and connections, determining drainage fixture units, drainage systems, drain pipe offsets, sumps and ejectors, and backwater valves.

Chapter 31 gives the requirements for vents systems, vent stacks and stack vents, vent terminals, vent connections and grades, fixture vents, individual vent, common vent, wet venting, waste stack vent, circuit venting, combination waste and vent system, island fixture venting, vent pipe sizing, and air admittance valves. Section P3102.1 requires every building to be vented from the building drain directly through the roof to open air. Table 3105.1 gives the maximum distance of a fixture trap from a vent. Section P3103.5 limits placement of vent terminals at openings. They shall not be placed less than four feet beneath door or window or other air intake opening. They shall not be within 10 feet horizontally of these openings unless they are two feet above the top of the opening.

Chapter 32 gives requirements for traps. Section P3201.2 requires liquid seals for all traps of a minimum of two inches and no more than four inches.

CHAPTER 34

ELECTRICAL

The Florida Building Code, Residential section E3401 references NFPA 70, National Electrical Code for the electrical requirements of residential buildings.

CHAPTER 41

SWIMMING POOLS

Chapter 41 regulates the design and installation of private swimming pools. The design and construction of a swimming pool shall conform with the requirements of ANSI/NSPI 3; ANSI/NSPI 4; ANSI/NSPI 5; ANSI/NSPI 6; and ANSI/NSPI 7. Typically, a pool contractor is hired with specialization in pool design and installation who has working knowledge of the applicable codes.