2017

FLOODPLAIN MANAGEMENT IN FLORIDA

Quick Guide

Florida Division of Emergency Management

Bureau of Mitigation
State Floodplain Management Office
2555 Shumard Oak Boulevard, Tallahassee, FL 32399

www.floridadisaster.org/mitigation

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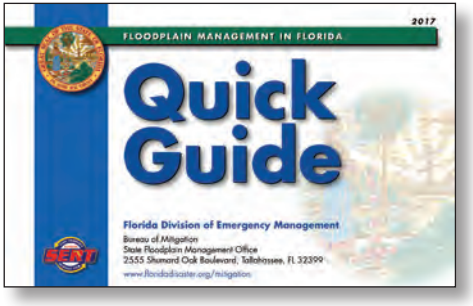
About This Guide

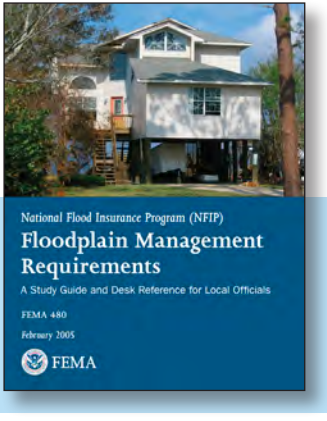
This **Quick Guide** helps local officials and citizens understand why and how Florida communities must manage development in floodplains to protect people and property. Flood-prone communities adopt codes and ordinances that detail the rules and requirements. In cases of conflict, those codes and ordinances, not the guidance provided in this publication, must be followed.



This **Quick Guide** was developed and funded jointly by the Florida Division of Emergency Management and the Federal Emergency Management Agency (FEMA).

Questions, comments and requests for additional copies should be directed to the Florida Division of Emergency Management, State Floodplain Management Office at floods@em.myflorida.com and (850) 815-4556.

For more detail on all aspects of floodplain management, please refer to FEMA 480, *National Flood Insurance Program, Floodplain Management Requirements: A Study Guide and Desk Reference for Local Officials.*



Prepared by:

RCQuinn Consulting, Inc.

Why Do We Regulate the Floodplain?

To protect people and property. Implementing floodplain management regulations reduces vulnerability to future flood risk. If we know low lying land will flood from time to time, we should make reasonable decisions to help protect our families, homes, and businesses.

To make sure Federal flood insurance is available. Communities must join the NFIP and administer floodplain management requirements before residents and businesses can purchase Federal flood insurance and to be eligible for some types of Federal assistance, including flood mitigation grants.

To save tax dollars. Every time communities experience flood disasters local budgets are impacted. If we build smart, we'll have fewer problems the next time the water rises. Remember, Federal disaster assistance is not available for all floods. Even when the President declares a disaster, communities still must pay a portion of repair and clean-up costs, temporary housing assistance, and evacuation expenses.

To avoid liability and lawsuits. If we know an area is mapped as a flood hazard area, and if we know people could be in danger and buildings could be damaged, doesn't it make sense to take reasonable protective steps as our communities develop and redevelop?

Since 1978, Federal flood insurance policy holders in Florida have received over $4 billion in claim payments. Even though that represents many payments, most of the State's flood-prone property owners do not have flood insurance.

What is the National Flood Insurance Program?

The National Flood Insurance Program (NFIP) was created by Congress in 1968 to protect lives and property and to reduce the financial burden of providing disaster assistance. The NFIP is administered by the Federal Emergency Management Agency (FEMA). Nationwide, over 22,200 communities participate in the NFIP— more than 460 Florida counties, cities and towns participate.

The NFIP is based on a mutual agreement between the Federal Government and communities. Communities that participate agree to regulate development in mapped flood hazard areas according to certain criteria and standards. The partnership involves:

- **Flood hazard maps.** In partnership with water management districts, communities and the State, FEMA produces flood maps in accordance with FEMA standards. The maps are used by communities, insurance agents, real estate professionals, and others.
- **Flood insurance.** Property owners and renters in participating communities are eligible to purchase Federal flood insurance for buildings and contents.
- **Regulations.** Communities must adopt and enforce minimum floodplain management regulations so that development, including buildings, is undertaken in ways that reduce exposure to flooding.

To learn more about the NFIP, including your potential flood risk and the approximate cost of a flood insurance policy, go to FEMA's FloodSmart website www.floodsmart.gov.

Community Responsibilities

To participate in the National Flood Insurance Program, communities agree to:

- **Recognize** flood hazards in community planning (see page 5)
- **Adopt and enforce** flood maps and a flood damage prevention ordinance
- **Require** permits for all types of development in the floodplain (see page 26)
- **Assure** that building sites are reasonably safe from flooding
- **Establish** Base Flood Elevations (BFE) where not determined on Flood Insurance Rate Maps (FIRMs)
- **Require** new and substantially improved homes and manufactured homes to be elevated above the BFE
- **Require** non-residential buildings to be elevated above the BFE, or dry floodproofed
- **Determine** if damaged buildings are substantially damaged
- **Conduct** field inspections; cite and remedy violations
- **Require and maintain** surveyed elevation information to document compliance (see pages 38, 39, and 41)
- **Carefully consider** requests for variances
- **Resolve** non-compliance and violations of floodplain management requirements
- **Advise and work** with FEMA and the State when updates to flood maps are needed
- **Maintain** records for review and respond to periodic requests for reports to FEMA

NFIP Recommended Planning Considerations

Florida communities should consider incorporating planning considerations in comprehensive plans, land development codes, floodplain management regulations, and Local Mitigation Strategies to reflect the long-term goal of increasing resiliency to future flooding. NFIP regulations (Section 60.22(c)) outline 19 factors for consideration, including:

- Divert development to areas outside the SFHA to reduce flood damage
- Full public disclosure to potential buyers of properties in the SFHA
- Acknowledge that SFHA development may increase flood risk of existing development
- Improve local drainage to control increased runoff that increases the probability of flooding on other properties
- Require additional elevation above the Florida Building Code (1-foot freeboard or more above BFE)
- Require elevation methods such as pilings or columns rather than fill to maintain the storage capacity of the floodplain and to minimize environmental impacts
- Require evacuation plans for manufactured home parks and subdivisions

Flood Insurance: Property Owner's Financial Protection

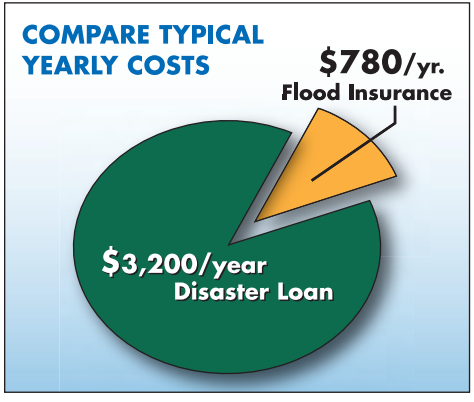
Who needs flood insurance? Federal flood insurance is required for all buildings in mapped flood zones shown on FEMA's maps if they are financed by Federally-backed loans or mortgages. All homeowners, business owners, and renters in communities that participate in the NFIP may purchase Federal flood insurance on any building and its contents, even if outside of the mapped flood zone. Homes in mapped flood zones are five times more likely to be damaged by flooding than by major fires.

Not in a mapped flood zone? Unfortunately, it's often after a flood that many people discover that their home or business property insurance does NOT cover flood damage. Approximately 25% of all flood damage occurs in low risk zones, commonly described as being "outside the mapped flood zone."

Protected by a levee or dam? Even areas protected by levees or other flood control structures have some risk of flooding if the structures are overtopped or fail. Even when levees provide "100-year" flood protection, there is still a chance that a higher flood will cause flooding.

What about disaster grants and loans? Federal disaster grants do not cover most losses and repayment of a disaster loan can cost many times more than the cost of a flood insurance policy.

Want to know more? Learn more at www.floodsmart.gov. To purchase a policy, call your insurance agent. To get the name of an agent in your community, use `<Find an Agency>` on the FloodSmart webpage.



The NFIP's Community Rating System (CRS)

The NFIP recognizes communities that achieve better flood resiliency by providing policy holders with reduced flood insurance premiums. Communities must apply to participate in CRS and commit to implement and certify activities that contribute to reduced flood risk. Examples of actions communities can take to reduce the cost of flood insurance premiums include:

- Preserve open space in the floodplain
- Enforce higher standards for safer development through zoning, stormwater, subdivision, and flood damage protection ordinances
- Develop hazard mitigation plans and watershed and storm management plans
- Undertake engineering studies and prepare flood maps
- Obtain grants to buy out or elevate houses or to floodproof businesses
- Maintain drainage systems
- Monitor flood conditions and issue warnings
- Inform people about flood hazards, flood insurance, and how to reduce flood damage

Community officials can request assistance from CRS specialists to help with the application process and prerequisites. Check the online CRS Resource Center (see page 70).

Property owners in more than 234 Florida communities that participate in the CRS receive premium discounts ranging from 5% to 35% (as of May 2017).

Community Rating System in Florida

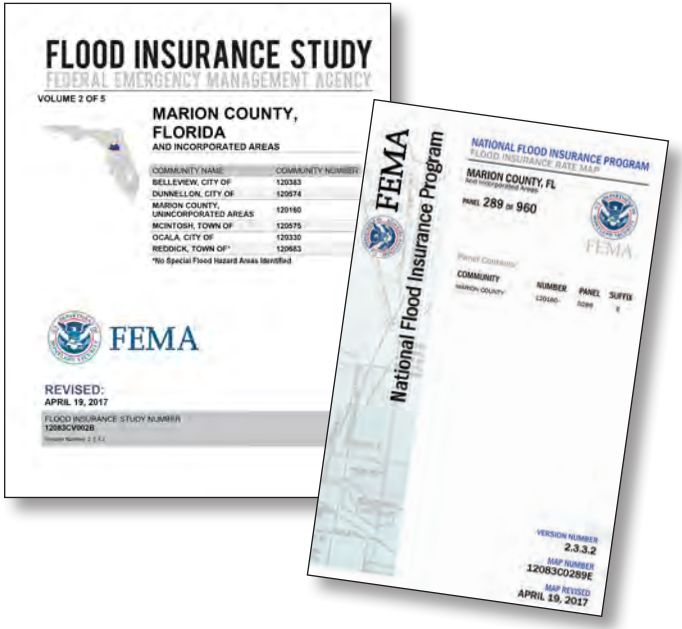
The State Floodplain Management Office helps CRS communities improve their ratings and helps non-CRS communities qualify for the program. Every community benefits by adopting and committing to implementation of Florida's *Seven Performance Measures*:

1. Adopt floodplain regulations coordinated with the Florida Building Code (see page 33)
2. Conduct annual inspections of flood hazard areas and resolve compliance matters
3. Adopt a flood zone permit application form, procedures and checklists
4. Use FEMA's Elevation Certificate form and verify accurate completion when certificates are submitted
5. Send letters to local propane and air conditioning companies about compliant installations
6. Use a set of forms and develop Substantial Improvement/Substantial Damage determination procedures
7. Provide online public access to digital Flood Insurance Rate Maps and Elevation Certificates

Download the *Seven Performance Measures* at www.floridadisaster.org/mitigation/CRS-CAV-pilotprogram

Florida's CRS communities save property owners more than $195 million each year by qualifying for Federal flood insurance premium discounts. If every Florida non-CRS community qualified at the lowest level for 5% discounts on Federal flood insurance premiums the additional savings would be about $976,000 each year. Data as of May, 2017.

Looking for FEMA Flood Map Information?



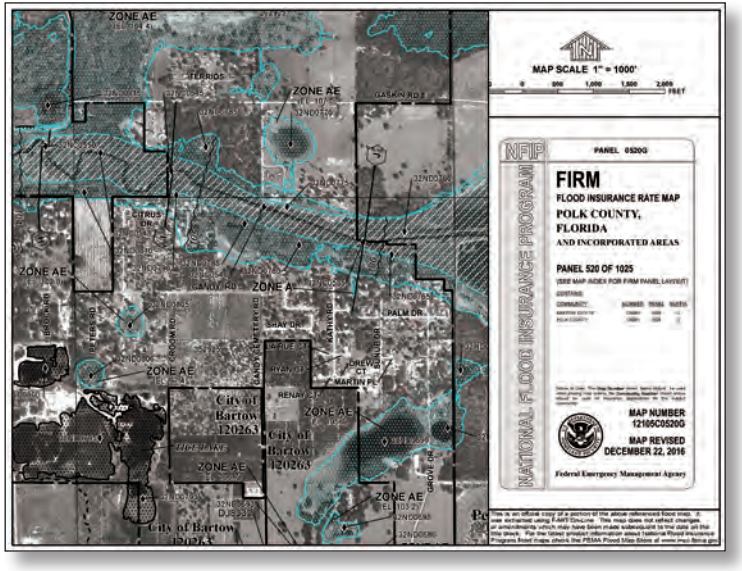
- Flood Insurance Studies (FISs) are compilations of flood risk information used for community planning and development.
- Flood Insurance Rate Maps (FIRMs) show flood zones subject to regulations and where Federal flood insurance is required.
- Access FIRMs at the FEMA Flood Map Service Center at www.fema.gov, where current and historical flood maps may be viewed and downloaded.
- Many cities and counties also make digital flood maps available online, sometimes with property parcel data.

Need a fast answer? Community planning, engineering, or permit offices and water management districts may also have paper flood maps available for viewing by the public.

FIRMette: FEMA Flood Maps Online

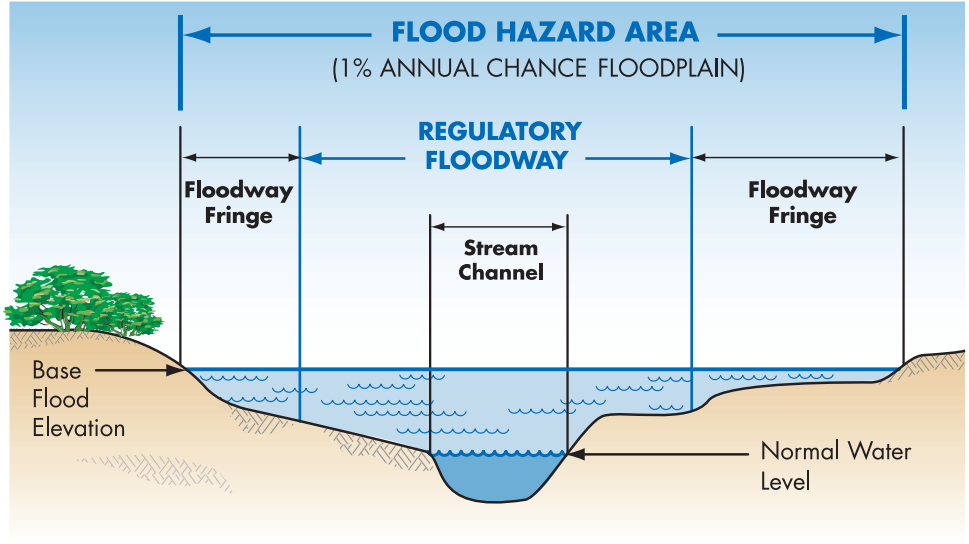
Portions of flood maps can be produced, saved, and printed by making a "FIRMette." FIRMettes are full-scale sections of FIRMs.

- The tutorial "How to Find Your FIRM and Make a FIRMette" is available at www.fema.gov/media-library/assets/documents/34930.
- Making a FIRMette is easy after a property is located. Use the `<Search by Address>` link or `<Search All Products>` to find the community and map panel of interest.
- Earlier versions of FIRMs are available for many communities, so current flood hazard information can be compared to historic data.



Go to www.msc.fema.gov and check out the "MSC Frequently Asked Questions." For step-by-step instructions on how to read flood maps, view the How to Read a Flood Insurance Rate Map Tutorial.

Understanding the Riverine Floodplain



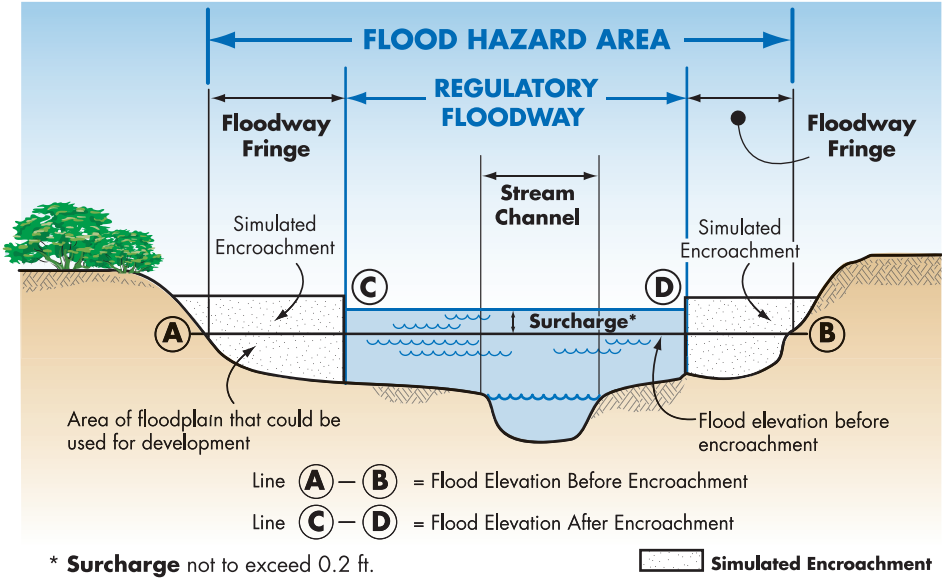
For riverine floodplains with Base Flood Elevations (BFEs) determined by detailed flood studies, the Flood Profile in the Flood Insurance Study shows water surface elevations for different frequency floods (see page 15).

Terms and Definitions

The **Special Flood Hazard Area (SFHA)** is that portion of the floodplain subject to inundation by the base flood (1% annual chance) and/or flood-related erosion hazards. Riverine SFHAs are shown on FIRMs as Zones A, AE, AH, AO, AR, and A99. Older FIRMs may have Zones A1-A30.

See page 12 to learn about the floodway, the area of the regulatory floodplain where flood waters usually are deeper and flow faster.

Understanding the Regulatory Floodway



Terms and Definitions

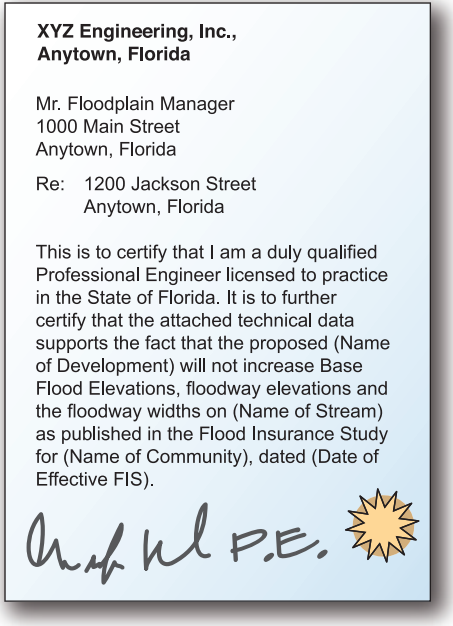
The **Floodway** is the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to pass the base flood discharge without cumulatively increasing flood elevations.

Computer models are used to simulate "encroachment" or development in the floodway fringe in order to predict where and how much the Base Flood Elevation would increase if the floodway fringe is allowed to be developed.

For any proposed floodway development, the applicant must provide evidence that "no rise" will occur or obtain a Conditional Letter of Map Revision (CLOMR) before a local floodplain permit can be issued (see page 23). Experienced registered professional engineers must make sure proposed projects either won't increase flooding or that any increases do not impact structures on other properties.

The Regulatory Floodway "No Rise" Certification

- Floodways convey the largest volume of water and may have high velocities.
- Some communities restrict development in regulatory floodways.
- Engineers must prepare floodway encroachment analyses to evaluate the hydraulic impact of proposed development.
- Development is not allowed unless certified to cause “no rise” (no increase) in Base Flood Elevations.
- “No rise” certifications must be signed, sealed, and dated by a Professional Engineer licensed in Florida and qualified to conduct hydraulic analyses.



XYZ Engineering, Inc.,
Anytown, Florida

Mr. Floodplain Manager
1000 Main Street
Anytown, Florida

Re: 1200 Jackson Street
Anytown, Florida

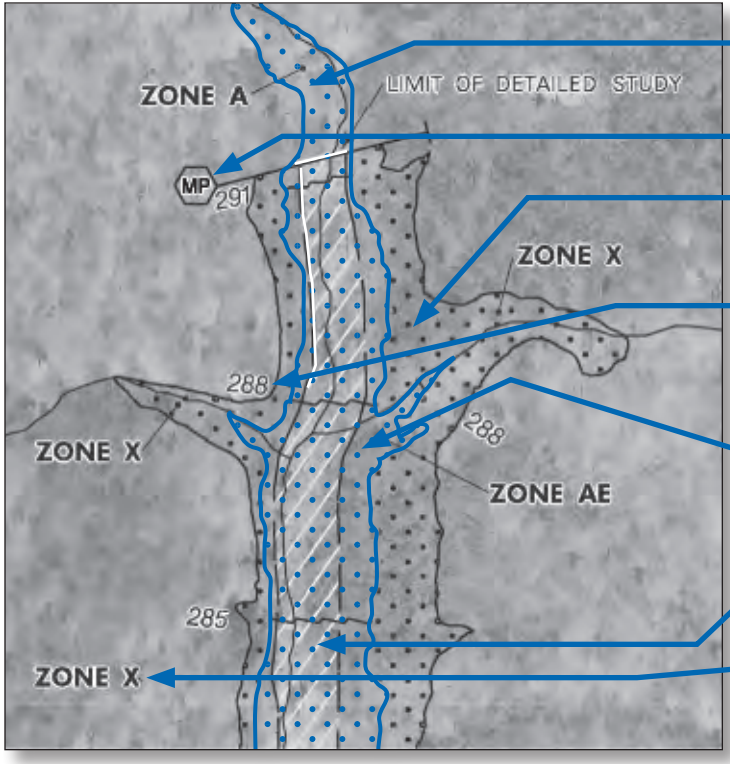
This is to certify that I am a duly qualified Professional Engineer licensed to practice in the State of Florida. It is to further certify that the attached technical data supports the fact that the proposed (Name of Development) will not increase Base Flood Elevations, floodway elevations and the floodway widths on (Name of Stream) as published in the Flood Insurance Study for (Name of Community), dated (Date of Effective FIS).

P.E.

The floodway encroachment analysis must be based on technical data obtained from FEMA.

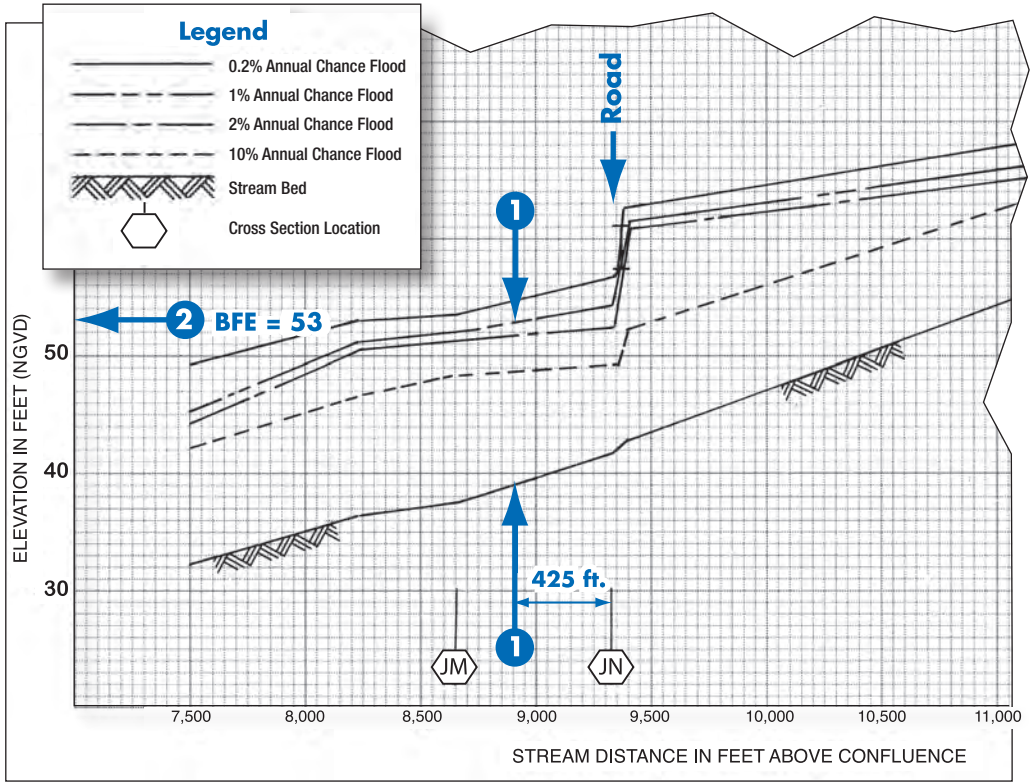
Reduce flood risk – don’t build in the Floodway!

Flood Insurance Rate Map (Riverine)



1. **Zone A** (approximate) is the flood hazard area without BFEs.
2. **Cross Section** location (see page 15).
3. **Shaded Zone X** is the 0.2% annual chance (500-year) floodplain (formerly Zone B).
4. **Base Flood Elevation (BFE)** is the water surface elevation of the base flood rounded to the nearest whole foot (consult FIS profiles and tables for more accurate elevations).
5. **Zone AE** is the 1% annual chance (100-year) floodplain with BFEs (formerly Zones A1- A30).
6. The **Floodway** is the cross-hatched area (see page 12).
7. **Unshaded Zone X** is all other areas considered low risk (formerly Zone C).

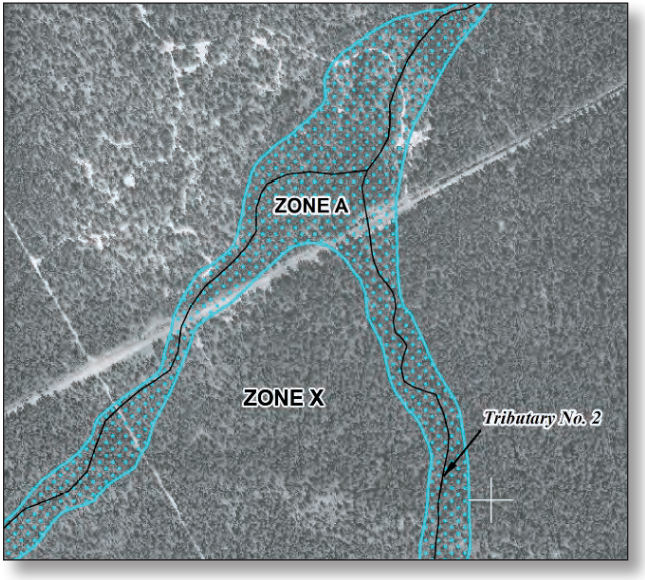
Using the Riverine Flood Profile to Determine Riverine BFEs



Flood Profiles from Flood Insurance Study reports can be used to determine the BFE at a specific site. Profiles also show estimated water surface elevations for floods other than the 1% annual chance flood (100-year).

1. On the effective flood map, locate the site by measuring the distance, along the profile baseline of the stream channel, from a known point such as a road or cross section, for example, JM or JN.
2. Scale that distance on the Flood Profile and read up to the profile of interest, then across to determine the BFE, to the nearest 1/10 of a foot. (Answer: 53 feet).

Approximate Flood Zones



FEMA uses existing information – not engineering studies – to draw Approximate Zone A boundaries. Information may be provided by the U.S. Army Corps of Engineers, other federal agencies, State and local agencies, and historic records.

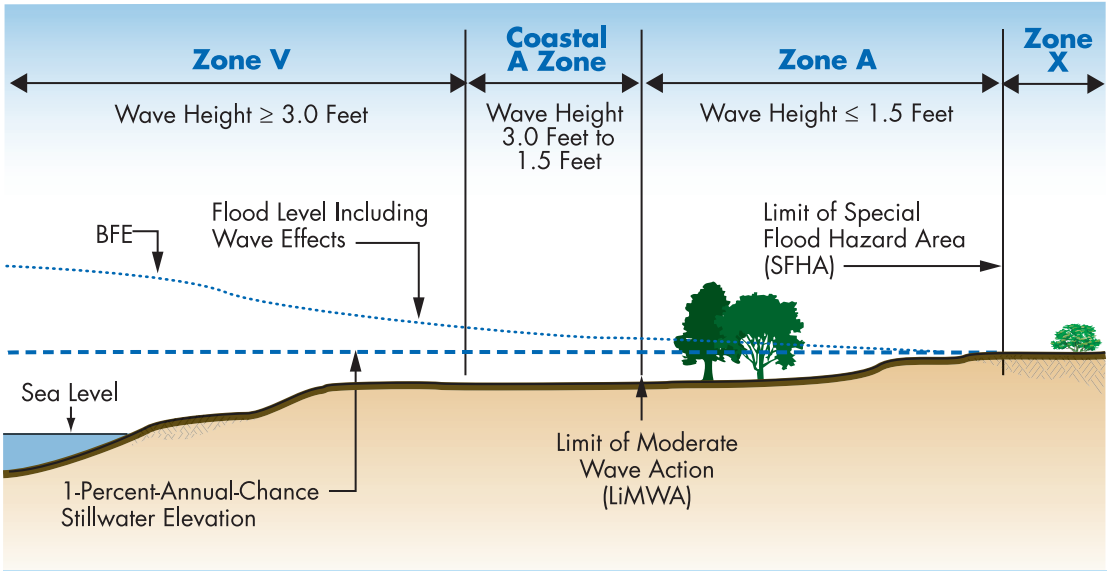
For assistance determining BFEs, contact community planning, engineering or permit offices or water management districts. Useful guidance for local officials and engineers is found in FEMA 265, *Managing Floodplain Development in Approximate Zone A Areas*.

Terms and Definitions

An **Approximate Zone A** is a special flood hazard area where BFE information is not provided.

If data are not available from another source, and provided there is no evidence indicating flood depths have been or may be greater than two-feet deep, local officials may specify the BFE is two feet above the highest adjacent grade.

Understanding the Coastal Floodplain



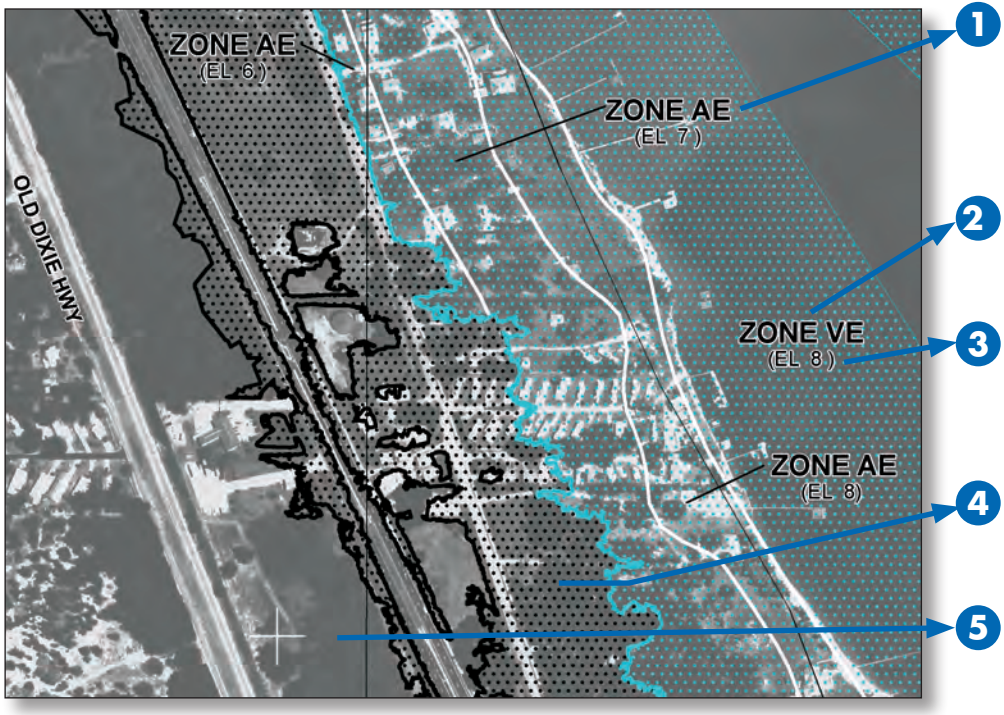
Areas subject to Coastal A Zone conditions (wave heights between 3 feet and 1.5 feet) may not be shown on FIRMs (see page 19). The Florida Building Code treats the CAZ area as Zone V and requires development to comply with the Zone V requirements.

Terms and Definitions

The **Coastal High Hazard Area (Zone V)** is the Special Flood Hazard Area that extends from offshore to the inland limit of a primary frontal dune along an open coast and any other area subject to high velocity wave action. The area is designated on the FIRM as Zone VE.

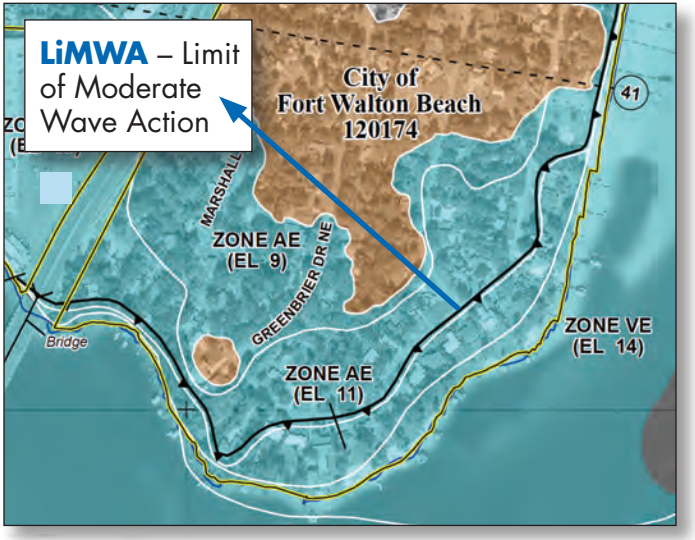
The term **Coastal A Zone (CAZ)** refers to a portion of the SFHA landward of a Zone V or landward of an open coast without Zone V. CAZs may be subject to breaking waves between 3 and 1.5 feet high.

Flood Insurance Rate Map (Coastal)



1. **Zone AE** is subject to flooding by the base or 1% annual chance (100-year) flood, and waves less than 3 feet high, (formerly Zones A1-A30).
2. **Zone VE** is where wave heights are expected to be 3 feet or more.
3. **Base Flood Elevation (BFE)** is the water surface elevation (in feet above the vertical datum shown on the map).
4. **Shaded Zone X** is the 0.2% annual chance (500-year) floodplain (formerly Zone B).
5. **Unshaded Zone X** is the area of minimal flood risk outside the 0.2% annual chance (500-year) floodplain (formerly Zone C).

The Coastal A Zone (CAZ)



Legend

Limit of Moderate Wave Action

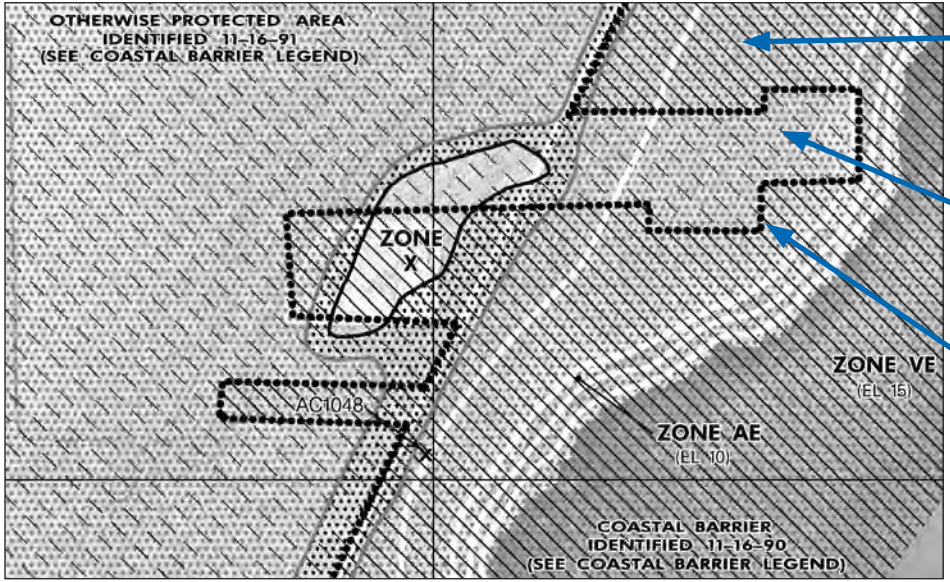
Notes to Users

AE Zone has been divided by a Limit of Moderate Wave Action (LiMWA). The LiMWA represents the approximate landward limit of the 1.5-foot breaking wave. The effects of wave hazards between the VE Zone and the LiMWA (or between the shoreline and the LiMWA for areas where VE Zones are not identified) will be similar to, but less severe than, those in the VE Zone.

- Post-flood evaluations and laboratory tests confirm that breaking waves as small as 1.5 feet high cause damage to walls and scour around foundations.
- The Limit of Moderate Wave Action may be shown on revised FIRMs to delineate the inland extent of Coastal A Zone conditions inland of Zone V or along shorelines without Zone V.
- Scour and erosion should be considered in CAZ if soils are sandy and erodible.
- Federal flood insurance in CAZs is rated using Zone A rates (lower than Zone V rates).

If a LiMWA is delineated or a community designates a CAZ, the Florida Building Code requires buildings to comply with Zone V construction requirements.

Coastal Barrier Resource System (CBRS)



1 Coastal Barrier Resources System (CBRS) Areas

2 Otherwise Protected Areas (OPAs)

3 CBRS and OPA Boundary

CBRS areas and OPA are normally located within or adjacent to Special Flood Hazard areas.

FIRMS show CBRS and OPA areas in undeveloped Coastal Barrier Resource System Areas. In these areas, NFIP insurance is not available for new construction and substantially improved structures built after October 1, 1983 or after the date the areas were designated.

Florida's Coastal Construction Control Line (CCCL)

The Department of Environmental Protection's Coastal Construction Control Line (CCCL) program is an essential element of Florida's coastal management program. The CCCL:

- **Provides protection** for Florida's beaches and dunes while assuring reasonable use of private property
- **Establishes areas in which special siting and design criteria** are applied for construction and related activities
- **Allows activities** that will not cause significant adverse impacts to the beach and dune system – local permits generally required.

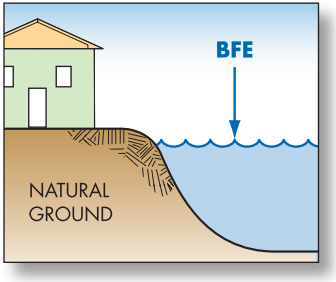
The Florida Building Code Section 3109 contains CCCL requirements for the design and construction of buildings (see page 34). Those requirements are similar to the code requirements for buildings in coastal high hazard areas (Zone V).

Alert! Code officials and design professionals are required to comply with the building code requirement for both the CCCL and flood hazard areas and must ensure that the more restrictive provisions prevail.

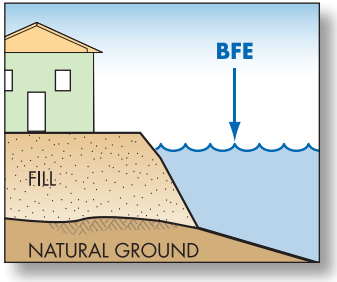
www.dep.state.fl.us/beaches/programs/ccclprog.htm

FIRM Revisions: LOMAs and LOMR-Fs

The most accurate information available is used to make flood maps, including topographic base maps and detailed engineering methods or methods of approximation. FEMA issues map revisions if technical data are submitted to support the changes.



Letter of Map Amendment (LOMA) is an official amendment to an effective FIRM that may be issued when a property owner provides additional technical information from a Florida licensed professional surveyor, such as ground elevation relative to the BFE. Lenders may waive the flood insurance requirement if the LOMA removes a building site from the SFHA because natural ground at the site is above the BFE.



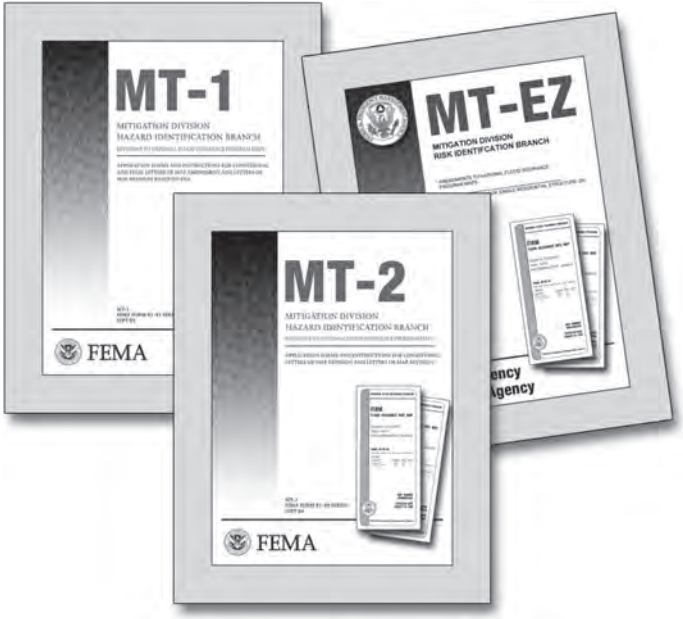
Letter of Map Revision Based on Fill (LOMR-F) is an official revision to an effective FIRM that is issued to document FEMA's determination that a structure or parcel of land has been elevated by fill above the BFE, and therefore is no longer in the SFHA. Lenders may waive the insurance requirement if the LOMR-F removes a building site from the SFHA.

Check www.fema.gov/letter-map-amendment-letter-map-revision-based-fill-process for guidance on maps revisions. Access to FEMA's web-based application for licensed land surveyors to submit eLOMAs is hazards.fema.gov/femaportal/resources/whatiseloma.htm.

FIRM Revisions: CLOMRs and LOMRs

- **Conditional Letter of Map Revision (CLOMR)** comments on whether a proposed project, if built as shown on the submitted documentation, would meet the standards for a map revision. Communities should require this evidence prior to issuing permits for fill or alteration of a watercourse. Certificates of Occupancy/Compliance should be withheld until receipt of the final LOMR based on "as-built" documentation and certification.

- **Letter of Map Revision (LOMR)** is an official revision to an effective FIRM that may be issued to change flood insurance risk zones, special flood hazard areas and floodway boundary delineations, BFEs and/or other map features. Lenders may waive the insurance requirement if the approved map revision shows buildings to be outside of the SFHA.



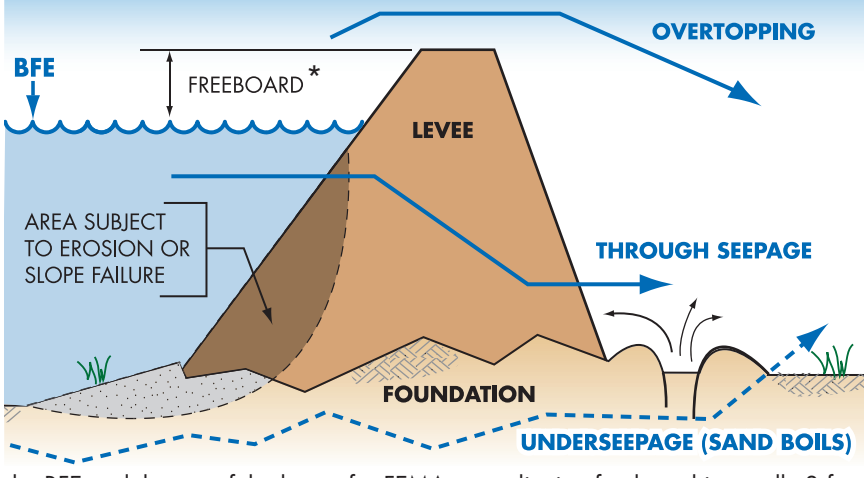
To learn more and download forms, find links by searching key words "MT-EZ," "MT-1," and "MT-2."

Levee Certification for FIRMs

Many levees are designed to protect land against flooding from the Base Flood. In order for FEMA to show those areas as outside of the Special Flood Hazard Area, communities and levee owners must certify that levees meet certain design criteria. Certification will present significant challenges during the map revision process.

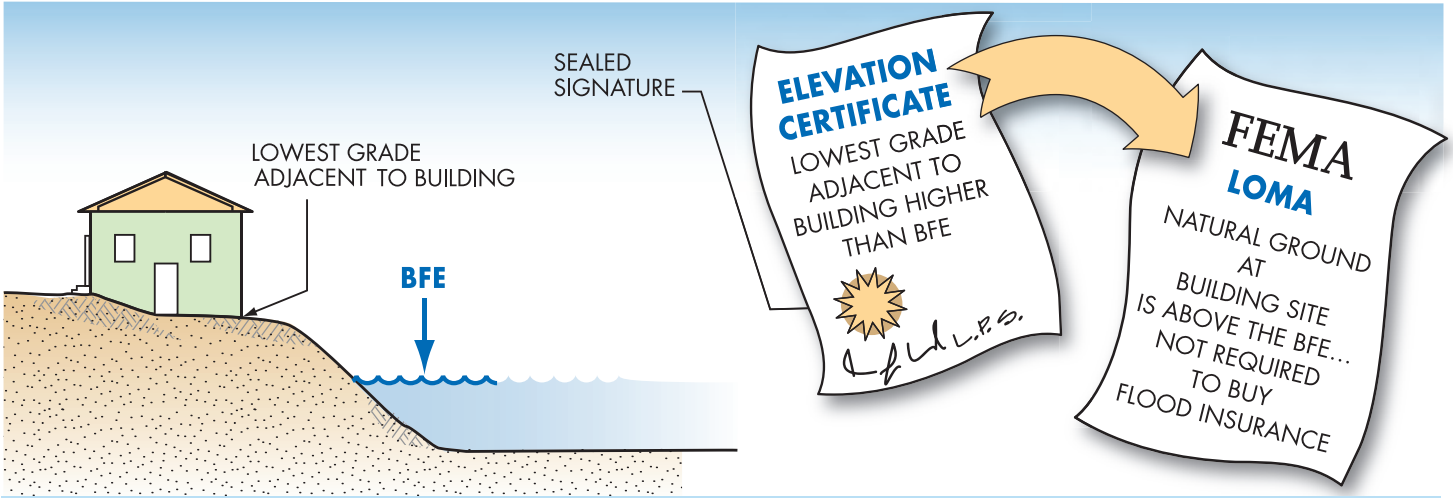
Communities that have levees should determine as soon as possible whether certification will be required. Pursuant to FEMA's Procedural Memoranda 34 and 43, and as outlined in Federal regulations at 44 CFR Section 65.10, the documentation requirements address:

- Freeboard
- Closures
- Embankment protection for erosion
- Embankment and foundation stability
- Settlement
- Interior drainage and seepage
- Operation and maintenance plans
- Other site specific criteria



* Freeboard is the distance between the BFE and the top of the levee; for FEMA accreditation freeboard is usually 3 feet

Are Building Sites Higher than the BFE?



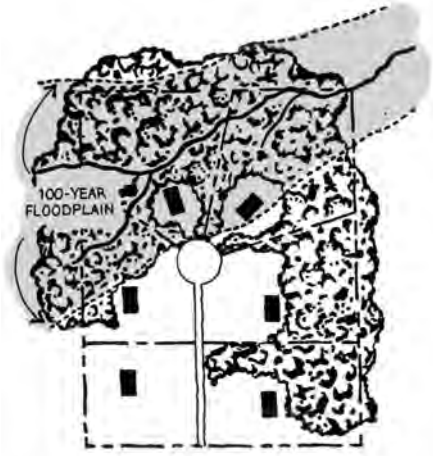
If land is shown on the map as "in" the SFHA, but the building site is higher than the Base Flood Elevation (BFE)… get a Florida licensed professional surveyor to complete a FEMA Elevation Certificate (EC). Submit a request for a Letter of Map Amendment to FEMA along with the EC to verify that the structure is above the BFE (see page 22). If FEMA approves the request, lenders are not required to require flood insurance policies, although some may still require them. Owners should keep certificates and LOMAs with deeds— the documentation will help future buyers.

Activities in SFHAs that Require Local Permits and Approvals

- Construction of new buildings
- Additions to buildings
- Substantial improvements of buildings
- Renovation of building interiors
- Repair of substantially damaged buildings
- Placement of manufactured (mobile) homes
- Subdivision of land
- Construction or placement of temporary buildings and accessory structures
- Construction of agricultural buildings
- Construction of roads, bridges, and culverts
- Placement of fill, grading, excavation, mining, and dredging
- Alteration of stream channels

Floodplain development or building permits must be obtained before these and **ANY** land-disturbing activities occur in flood zones.

Avoid Flood Area When Possible

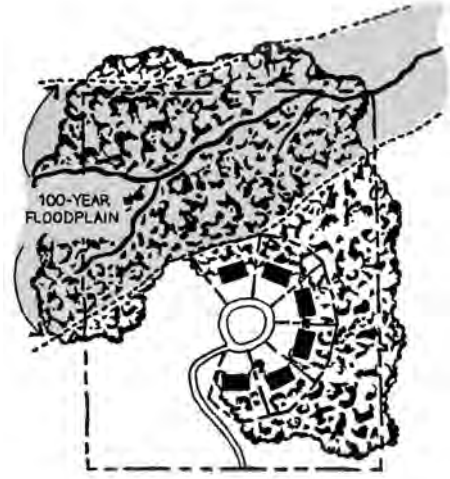


All land subdivided into lots, some homesites and lots partially or entirely in the floodplain.

NOT RECOMMENDED

All land subdivided into lots, some lots partially in the floodplain, setbacks modified to keep homesites on high ground.

RECOMMENDED



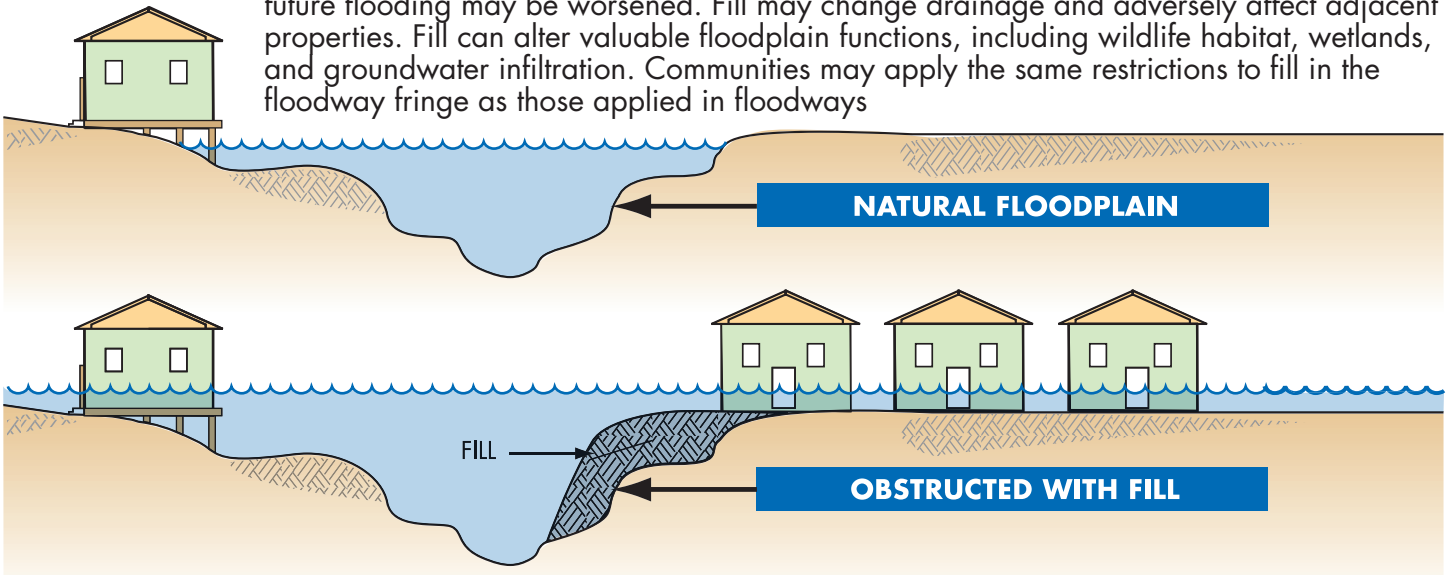
Floodplain land put into public/common open space, net density remains, lot sizes reduced and setbacks modified to keep homesites on high ground.

RECOMMENDED

Let the floodplain perform its natural function – if possible, keep it as open space. Other compatible uses: recreational areas, playgrounds, reforestation, unpaved parking, gardens, pasture, and created wetlands.

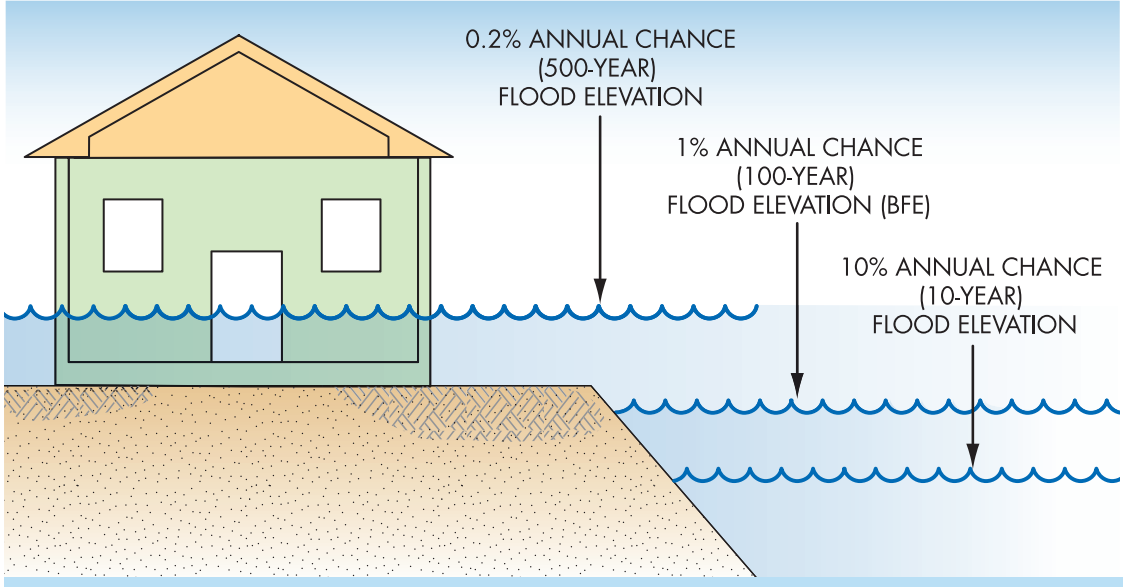
Fill Can Adversely Affect Floodplain Functions

Floodplains are supposed to store floodwater. If storage space is blocked by fill material, future flooding may be worsened. Fill may change drainage and adversely affect adjacent properties. Fill can alter valuable floodplain functions, including wildlife habitat, wetlands, and groundwater infiltration. Communities may apply the same restrictions to fill in the floodway fringe as those applied in floodways



Communities should make sure fill in flood zones won't harm neighboring properties. Before deciding to use fill, property owners should check with local planning, engineering, or permit offices. Engineering analyses may be required to demonstrate that fill will cause "no rise" (see page 13).

Floods Don't Always Stop at the BFE



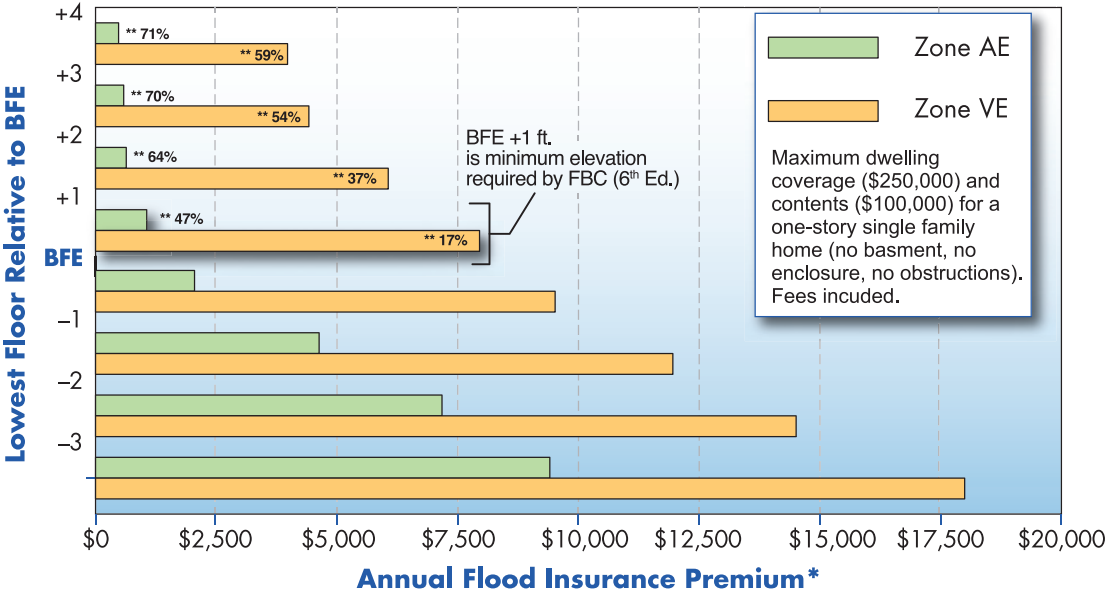
Important Information

Many people don't understand just how risky building in flood zones can be. There is a greater than 26% chance that a non-elevated home in the SFHA will be flooded during a 30-year mortgage period. The chance that a major fire will occur during the same period is less than 5%!

CAUTION! Major storms and flash floods can cause flooding that rises higher than the Base Flood Elevation (BFE). Be safer – protect your home or business by avoiding flood zones or building higher. See page 30 to see how this will save you money on flood insurance.

Freeboard: Build Higher, Reduce Damage, Save on Insurance

Freeboard is additional height – a factor of safety – above the BFE. Buildings that are higher than the BFE experience less damage. Starting with the 6th Edition, the Florida Building Code requires all buildings to be elevated to at least BFE plus 1 foot. Owners of buildings elevated above the BFE also save on Federal flood insurance.



* Unofficial estimates using 2014 rates; use only for comparison purposes

** Savings over at-BFE premium

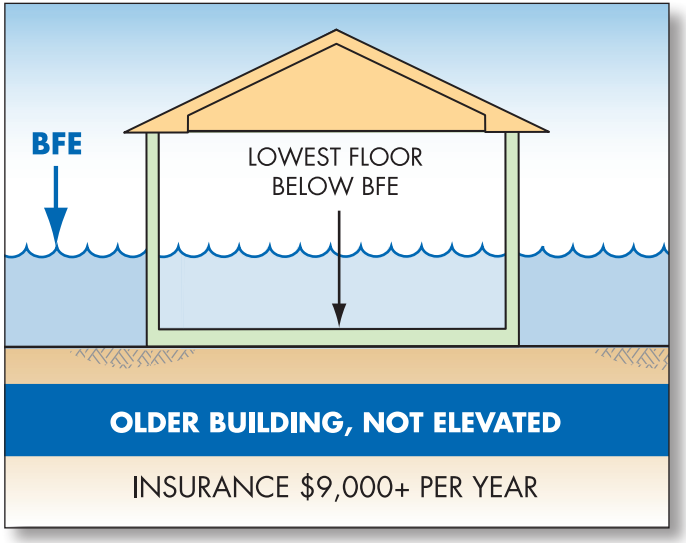
Important Information

NOTE! Flood insurance rates and various fees change from time to time. Rather than specific costs for insurance, these figures give a feel for how much difference just a foot or two can make.

Remember! Builders must submit floor elevations as part of foundation inspections. An error of just 6 or 12 inches could more than double the cost of Federal flood insurance.

A community may be able to grant a variance, but the owner will probably be required to buy insurance. Imagine trying to sell a house if the bank requires insurance that costs more than $9,000 to $18,000 a year!

Variances From Elevation Requirements



Very specific conditions related to the property (not the owner's actions or preferences) must be satisfied to justify a variance:

- Good and sufficient cause
- Unique site conditions
- Non-economic hardship
- If in the floodway, no increase in flood level

A variance that allows construction below the BFE does not waive the lender's flood insurance requirement. Flood insurance will be very expensive – perhaps more than $9,000 to $18,000 per year (see page 30)!

Property owners and communities must carefully consider the impacts of variances to allow buildings below the BFE. Not only will buildings be more likely to sustain flood damage, but Federal flood insurance will be very costly. Communities with a pattern of granting variances may be subject to NFIP sanctions, costing all insurance policyholders even more.

Fundamentals of Flood Resistant Construction

The flood resistant construction requirements of the NFIP and the Florida Building Code (FBC) share the common objective of increasing resistance to flooding. Although there are some differences between specific requirements, they all include the following fundamentals – buildings should have:

- **Foundations** capable of resisting flood loads (including dry floodproofed nonresidential buildings)
- **Structurally sound walls and roofs** capable of minimizing penetration by wind, rain, and debris
- **Lowest floors elevated** high enough to prevent floodwaters from entering during the design event
- **Equipment and utilities** elevated or designed to remain intact and be restored easily
- **Enclosures below elevated floors** limited to parking, limited storage, and building access and are designed to minimize damage
- **Flood damage-resistant materials** used below elevated lowest floors

In short … flood resistant buildings!

Flood Provisions of the Florida Building Code

Starting with the 2010 edition, the Florida Building Code (FBC) includes flood provisions that meet or exceed the NFIP requirements for buildings and structures. All counties, cities and towns are required to enforce the FBC. Many Florida communities enforce some "higher standards" than those required by the FBC.

- **FBC, Building:** Flood provisions are primarily in Section 1612 Flood Loads, which refers to the standard *Flood Resistant Design and Construction* (ASCE 24). Table 1612.1 shows cross references to all of the flood provisions in all of the Florida codes.
- **FBC, Residential:** Flood provisions are primarily in Section R322 Flood-Resistant Construction, although there are requirements in several other sections.
- **FBC, Existing Building:** Flood provisions are found in sections on repairs, alterations, additions, and historic structures and in sections on prescriptive and performance compliance methods.
- **FBC, Plumbing, Mechanical, Fuel Gas:** Flood provisions are in a number of sections.

Excerpts of the flood provisions of the FBC, "Highlights of ASCE 24," and other resource materials are available online www.floridadisaster.org/Mitigation/SFMP/lobc_resources.htm.

New Flood Requirements in the 6th Edition of FBC

Significant changes included in the 6th Edition FBC:

- **Requires Freeboard.** Minimum BFE plus 1 foot for dwellings in all flood zones
- **Coastal A Zone.** If delineated, regulated like Zone V with stemwalls permitted
- **Flood Openings.** Required in all walls, including breakaway walls, and performance of engineered flood openings emphasized
- **Exterior Door.** Required at top of stairways enclosed by breakaway walls
- **Critical Facilities.** Elevated or protected to the higher of BFE plus 2 feet or 500-year flood elevation
- **Local Scour and Erosion.** Must be considered for foundations in Zone V and CAZ
- **Mixed Use.** Defined in ASCE 24 commentary for limitations on dry floodproofing nonresidential portions of mixed use buildings

Building A Safer Florida, Inc.

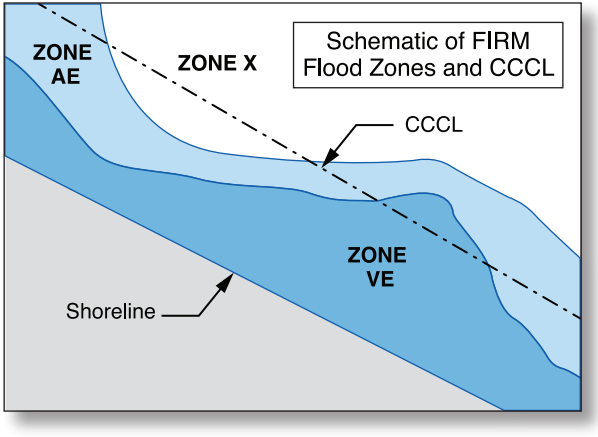
Visit www.buildingasaferflorida.org to download fact sheet summaries of the flood resistant construction requirements and CCCL requirements of the Florida Building Code

CCCL Requirements in the Florida Building Code (6th Ed.)

The CCCL requirements in the FBC, Section 3109, were modified from previous editions to align more closely with the Coastal High Hazard Area (Zone V) requirements of Section 1612, which refers to ASCE 24. This minimizes variations in case-by-case interpretations to determine which requirements are more restrictive.

The Florida Division of Emergency Management worked with the Florida Department of the Environment Protection to modify Section 3109 which:

- Applies to habitable structures (a defined term) and retains statutory exemptions, while clarifying Section 1612 applies to all buildings and structures and exemptions in flood zones
- Requires use of the BFE or the FDEP 100-year storm elevation, whichever is higher
- Uses the Section 1612 definitions for substantial improvement and lowest floor
- Uses the ASCE 24 requirements for breakaway walls and permits elevator shafts and shear walls (with limitations)
- Limits uses of enclosures below the BFE to parking, storage, and building access, but permits other defined "allowed uses" in areas that are above the BFE and below the DEP 100-year storm elevation
- Permits non-breakaway structural slabs below the lowest floor provided the slabs are designed to withstand flood loads



Some Key Floodplain Development Permit Review Steps

The permit reviewer must check many things. Some of the key questions are:

- Is the site near a watercourse?
- Is the site in the mapped flood zone or floodway?
- Are applicants advised that other State or Federal permits must be obtained before work starts?
- Is the site reasonably safe from flooding?
- Does the site plan show the flood zone, Base Flood Elevation and building location?
- Is substantial improvement or repair of substantial damage proposed?
- Is an addition proposed?
- Will new buildings and utilities be elevated properly?
- Will manufactured homes be properly elevated and anchored?
- Do the plans show an appropriate and safe foundation?
- Are all required design certifications submitted?
- Will the owner/builder have to submit an as-built Elevation Certificate?

Carefully Complete the Permit Application

Owner's Name
David & Sally Jones

Site Address, Tax#, Parcel #
781 Orange Blossom Ct., 400-33A-002

A. Description of Work

1. Proposed Development Description:

- ☒ New Construction
- ❑ Alteration or Repair
- ☒ Filling
- ❑ Grading
- ❑ Dredging
- ❑ Manufactured/Modular
- ❑ Logging
- ❑ Other

2. Size and Location of Development:
single family (2,000 cu yds. fill); flood fringe of dry river

3. Type of Construction

- ☒ New Residential
- ❑ New Non-Residential
- ❑ Addition
- ❑ Improvement
- ❑ Renovation
- ❑ Accessory Structure
- ❑ Temporary

Applicant's Signature
David M. Jones

Part of a sample Flood Zone Permit Application

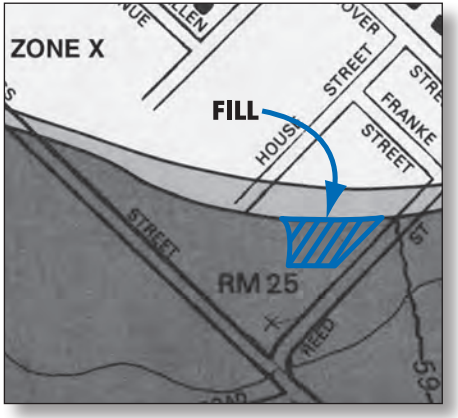
(may vary by community)

Community Map and Elevation Data:

1. Community No. 120243
2. Panel No. 125C
3. Zone AE
4. Base Flood Elevation 59.2
5. Floodway ❑ Yes ☒ No
6. Required Lowest Floor Elevation (including basement) 60.2
7. Elevation to which all attendant utilities, including all heating, duct work, and electrical equipment will be installed or floodproofed 60.2

Important Information

You must get all permits **before** you do work in a flood zone.



Good information will lead to better construction and less exposure to future flood damage. Download a sample application form at www.floridadisaster.org/mitigation/CRS-CAV-pilotprogram

Communities Must Retain Flood Records Permanently

Communities that participate in the NFIP agree to maintain certain documentation for all development in flood zones, including:

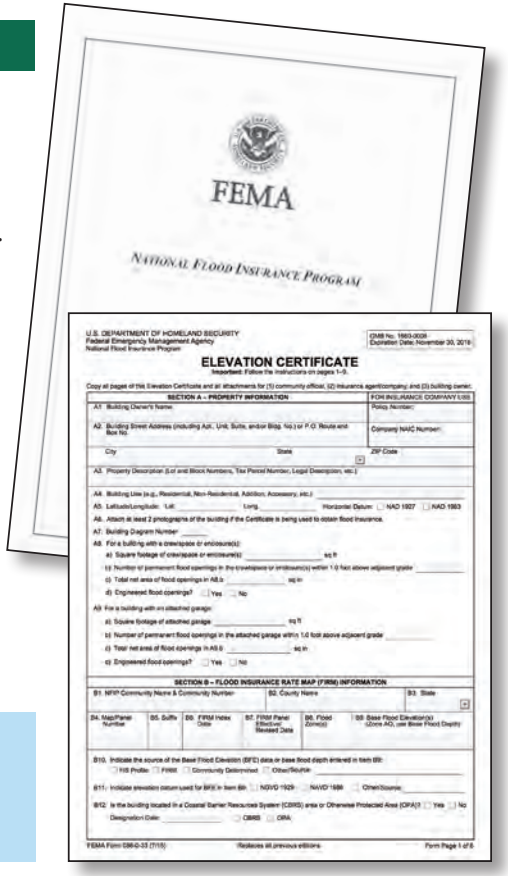
- Permits issued and variances granted
- Floodway encroachment (no rise) and watercourse alteration
- Design certifications for buildings in Zone V and CAZ, including breakaway walls
- Design certifications for dry floodproofed nonresidential buildings
- Design certification for engineered flood openings
- Determinations of whether work on existing buildings is substantial improvement or repair of substantial damage
- Surveyed "as-built" building elevations (Elevation Certificates)

Important Information

Florida's *General Records Schedule GS1-SL For State and Local Government Agencies* requires permanent retention of records "documenting the authorization process for construction" including applications, maps, Elevation Certificates, and related documentation. CRS communities must maintain records related to recertification as last as they are active CRS participants.

What is the Elevation Certificate and How is it Used?

- The Elevation Certificate (EC) is a FEMA form. Go to www.fema.gov and search for "Elevation Certificate."
- The EC must be completed and sealed by a Florida licensed surveyor.
- Community officials may complete the EC for sites in Approximate Zone A and Zone AO (see Section G of the EC).
- It can be used to show lowest grades adjacent to planned or existing building sites are above the Base Flood Elevation (see page 25).
- It is used to verify building and equipment elevations.
- Insurance agents use the EC to write and rate flood insurance policies.
- See page 71 for online Elevation Certificate training information



By itself, the EC cannot be used to waive the requirement to obtain flood insurance. See page 22 to learn about FEMA's Letter of Map Amendment process.

ELEVATION CERTIFICATE (partial)

SECTION C – BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

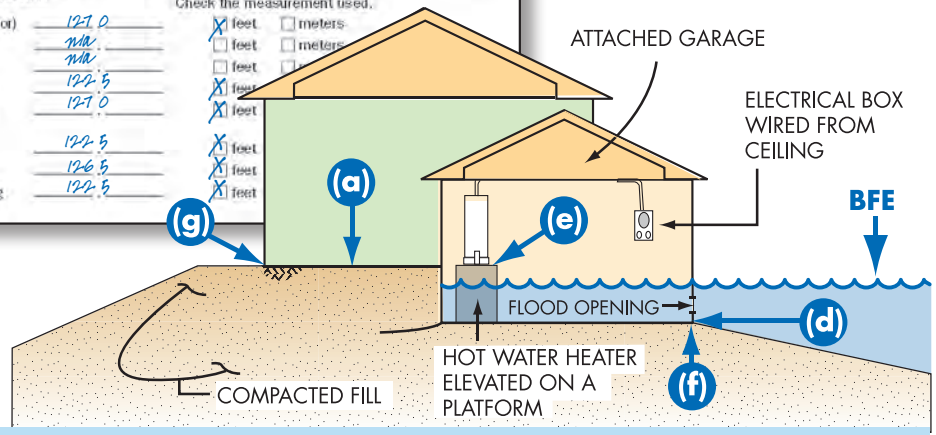
C1. Building elevations are based on: ☐ Construction Drawings* ☐ Building Under Construction* ☒ Finished Construction
*A new Elevation Certificate will be required when construction of the building is complete.

C2. Elevations – Zones A1–A30, AE, AH, A (with BFE), VE, V1–V30, V (with BFE), AR, AR/A, AR/AE, AR/A1–A30, AR/AH, AR/AO. Complete Items C2.a–h below according to the building diagram specified in Item A7. In Puerto Rico only, enter meters.

Benchmark Utilized: _____ Vertical Datum: _____

Indicate elevation datum used for the elevations in items a) through h) below. ☐ NGVD 1929 ☐ NAVD 1988 ☐ Other/Source: _____
Datum used for building elevations must be the same as that used for the BFE.

		Check the measurement used.	
a) Top of bottom floor (including basement, crawlspace, or enclosure floor)	127.0	☒ feet	☐ meters
b) Top of the next higher floor	na	☐ feet	☐ meters
c) Bottom of the lowest horizontal structural member (V Zones only)	na	☐ feet	☐
d) Attached garage (top of slab)	122.5	☒ feet	
e) Lowest elevation of machinery or equipment servicing the building (Describe type of equipment and location in Comments)	127.0	☒ feet	
f) Lowest adjacent (finished) grade next to building (LAG)	122.5	☒ feet	
g) Highest adjacent (finished) grade next to building (HAG)	126.5	☒ feet	
h) Lowest adjacent grade at lowest elevation of deck or stairs, including structural support	122.5	☒ feet	



In this example, the BFE is 125.0 feet.

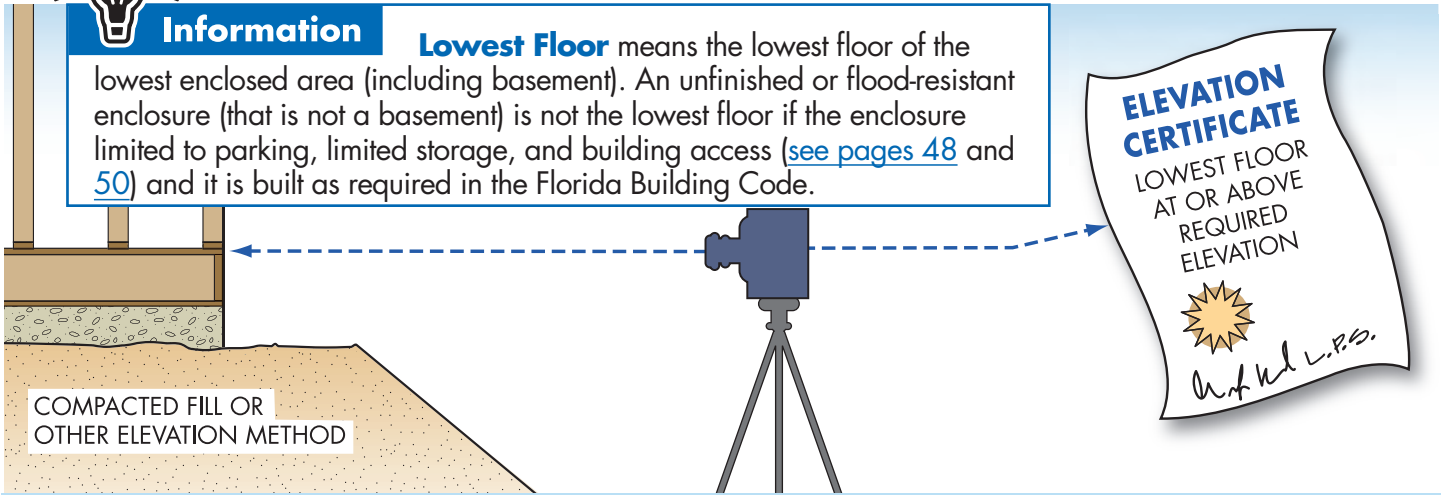
The slab-on-grade house was elevated on fill 2 feet above the BFE; the garage is 2.5 feet below the BFE (with flood openings).

The FBC requires submission of elevation documentation two times, when the lowest floor is set and prior to further vertical construction and again prior to the final inspection. A Florida licensed professional surveyor must fill out and seal the EC form (except in zones without BFEs). The EC includes diagrams for different building types. Several points must be surveyed.

Paperwork is Important for Owners

Important Information

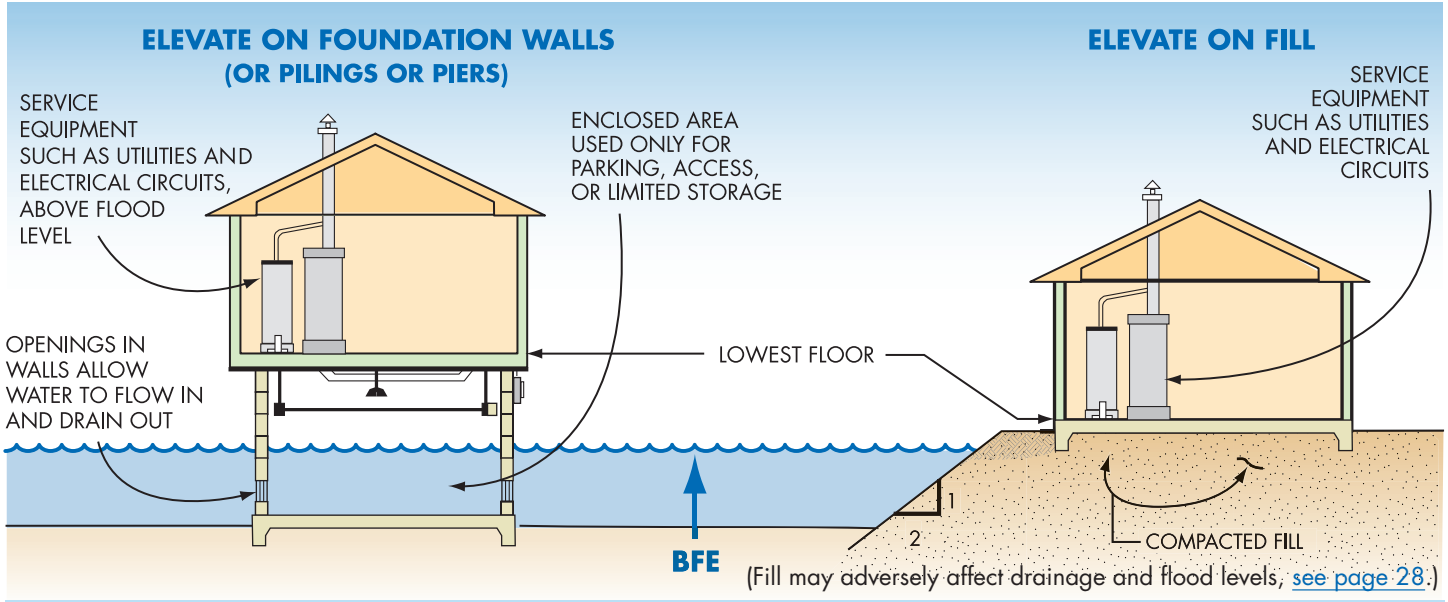
Lowest Floor means the lowest floor of the lowest enclosed area (including basement). An unfinished or flood-resistant enclosure (that is not a basement) is not the lowest floor if the enclosure limited to parking, limited storage, and building access (see pages 48 and 50) and it is built as required in the Florida Building Code.



Permittees must submit Elevation Certificates after the lowest floor (or lowest horizontal structural member) is placed and prior to further vertical construction. When construction is finished, another Elevation Certificate ("as-built") must be submitted prior to the final inspection.

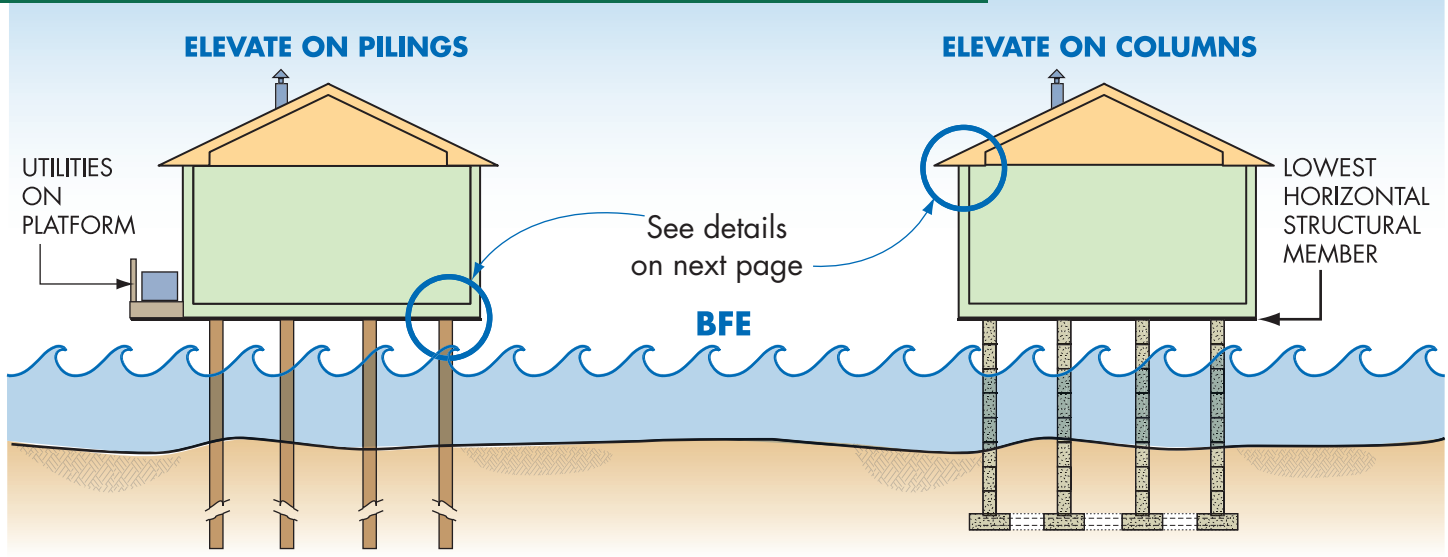
Owners should keep Elevation Certificates in a safe place. They can be used to demonstrate buildings were compliant at the time of construction. Also, Elevation Certificates are required to obtain Federal flood insurance policies.

How to Elevate Buildings in Flood Zone A/AE



CAUTION! Enclosures (including crawlspaces) have some special requirements (see pages 48 and 50). Note: When the walking surface of the lowest floor is at the BFE, under-floor utilities are not allowed. Fill used to elevate buildings must be placed properly (see pages 28 and 46).

How to Elevate Buildings in Flood Zone V and CAZ

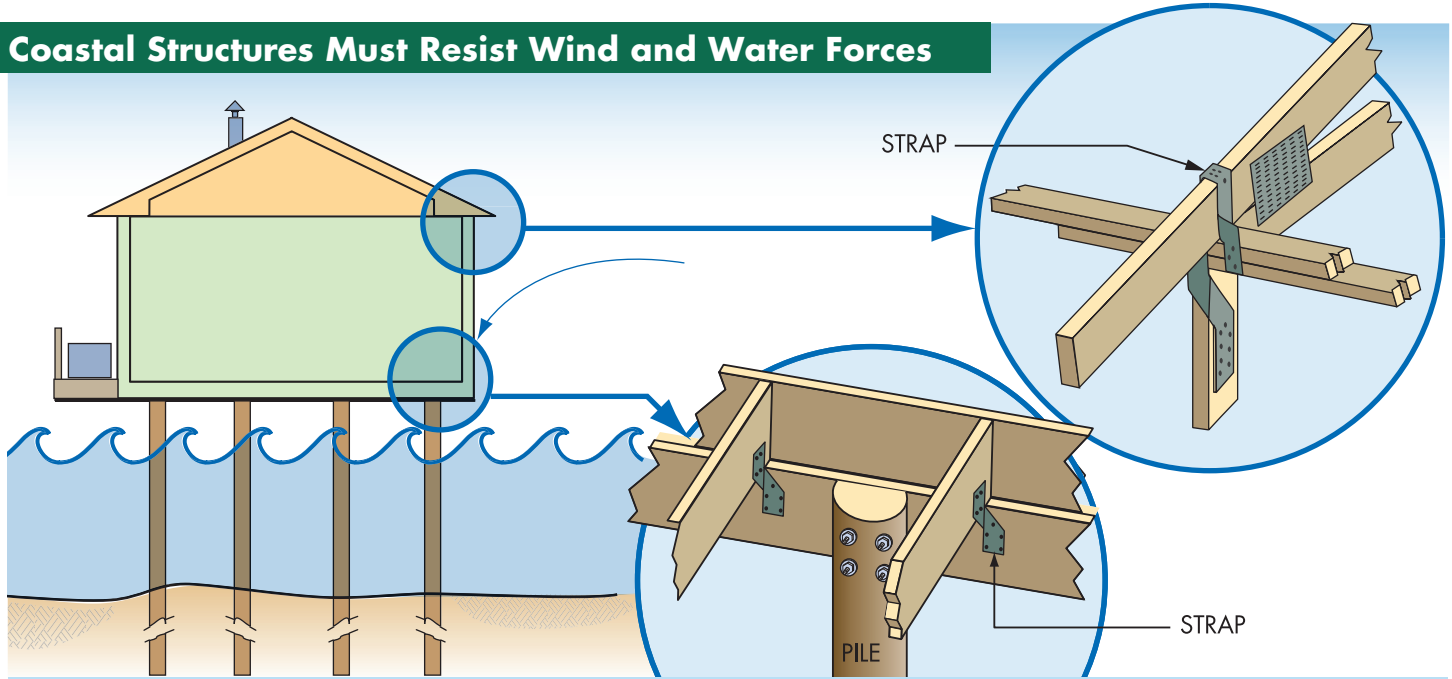


Wood, Concrete, or Metal Pilings Driven to Proper Depth Offer More Protection Against Scour

Reinforced Masonry or Concrete Columns on Reinforced Grade Beams

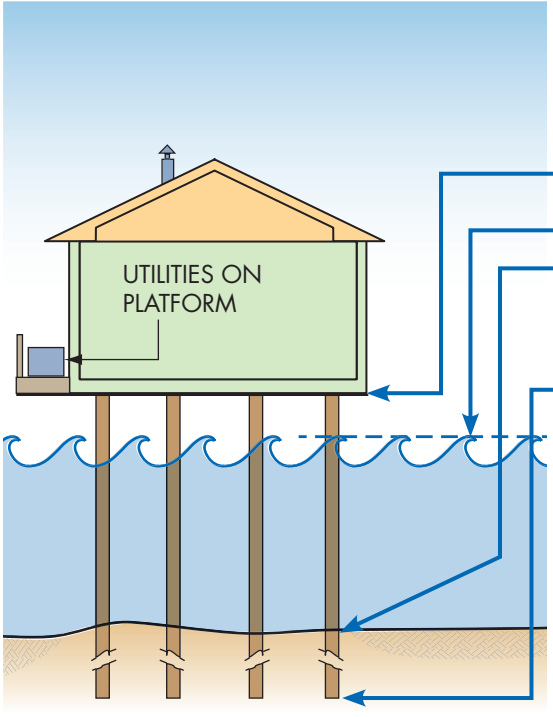
In Zone V and CAZ, the design specifics will be determined by an architect or engineer based on the site, including how the building will be elevated and how deep the foundation elements will be in the ground. A *Zone V Design Certificate* or statement will be required (see page 45). For more information, see FEMA P-55, *Coastal Construction Manual*.

Coastal Structures Must Resist Wind and Water Forces



Coastal buildings may be exposed to hurricane winds, waves, and floodwater. Structural building components must be connected together to transfer forces in a continuous load path from the roof to the foundation and the ground. The details above are some examples of how this is done. An architect or engineer must determine the types of connections required for the roof, building, and foundation.

The Zone V Design Certificate



ZONE V DESIGN CERTIFICATE (Partial)

SECTION II: Elevation Information Used for Design

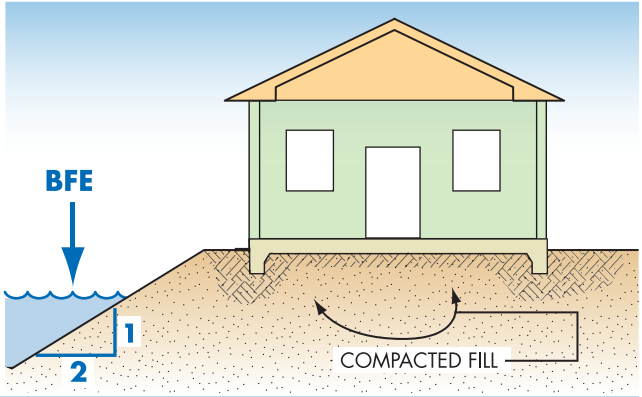
1. Datum ..... ☐ NGVD ☒ NAVD ☐ Other
2. Elevation of the Bottom of Lowest Horizontal Structural Member ..... 14 feet above datum
3. Base Flood Elevation (BFE) ..... 12 feet above datum
4. Elevation of Lowest Adjacent Grade ..... 6 feet above datum
5. Approximate Depth of Anticipated Scour/Erosion used for Foundation Design ..... 3 feet
6. Embedment Depth of Pilings or Foundation Below Lowest Adjacent Grade ..... 16 feet

A Florida licensed engineer or architect must review and/or prepare the building design and complete a *Zone V Design Certificate* for any new construction, substantial improvement, or the repair of a substantially damaged structure. This form is on the State Floodplain Management Office webpage (see page 70).

Placement and Compaction of Fill in Zone A/AE

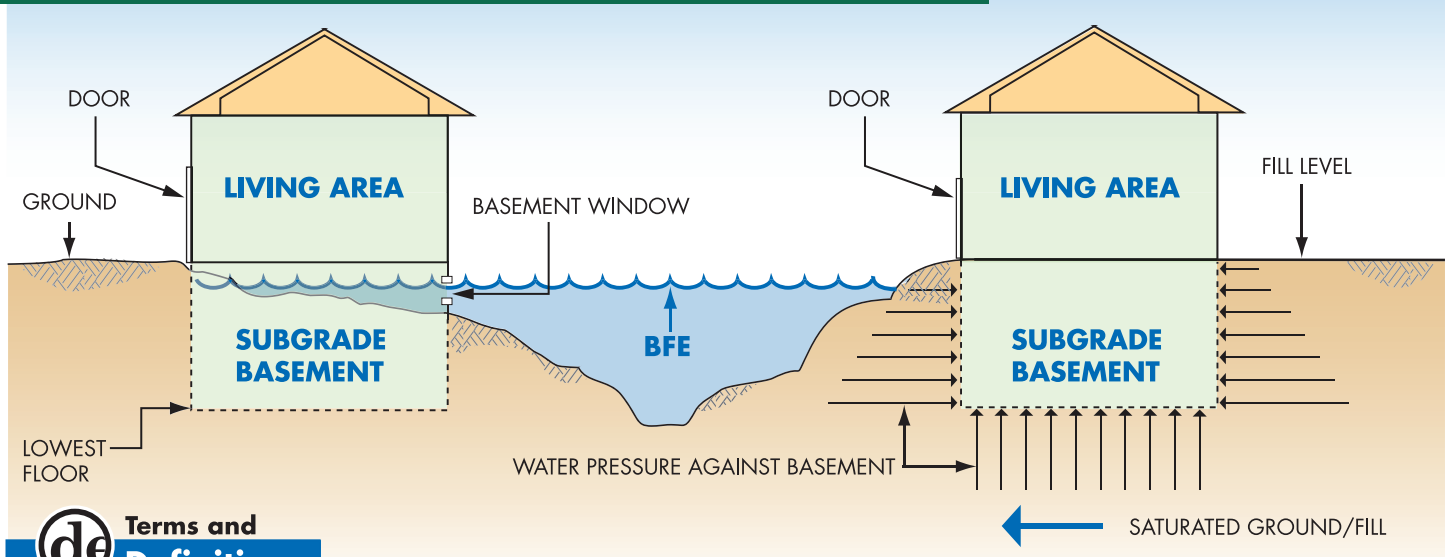
Earthen fill used to raise the ground above the flood elevation must be placed properly so that it does not erode or slump when water rises. For safety and to meet requirements, fill should:

- Not be placed in areas with poor drainage or where the fill may divert water onto adjacent properties. Instead, use perimeter walls, piers or pilings to minimize drainage problems.
- Be good clean soil, free of large rocks, construction debris, and woody material (stumps, roots)
- Be machine-compacted to 95 percent of the maximum density (determined by a design professional)
- Have graded side slopes that are not steeper than 2:1 (one foot vertical rise for every 2 feet horizontal extent); 3:1 flatter slopes are recommended
- Have slopes protected against erosion (vegetation for "low" velocities, durable materials for "high" velocities – determined by a design professional)
- Avoid the floodway (see page 12)



Engineers can find more information in FEMA's instructions for Letters of Map Revision based on Fill (FEMA Form MT-1) and NFIP Technical Bulletin #10.

Basements in Flood Zones Are Unsafe



Terms and Definitions

A **basement** is any portion of a building that has its floor sub-grade (below ground level) on all sides.

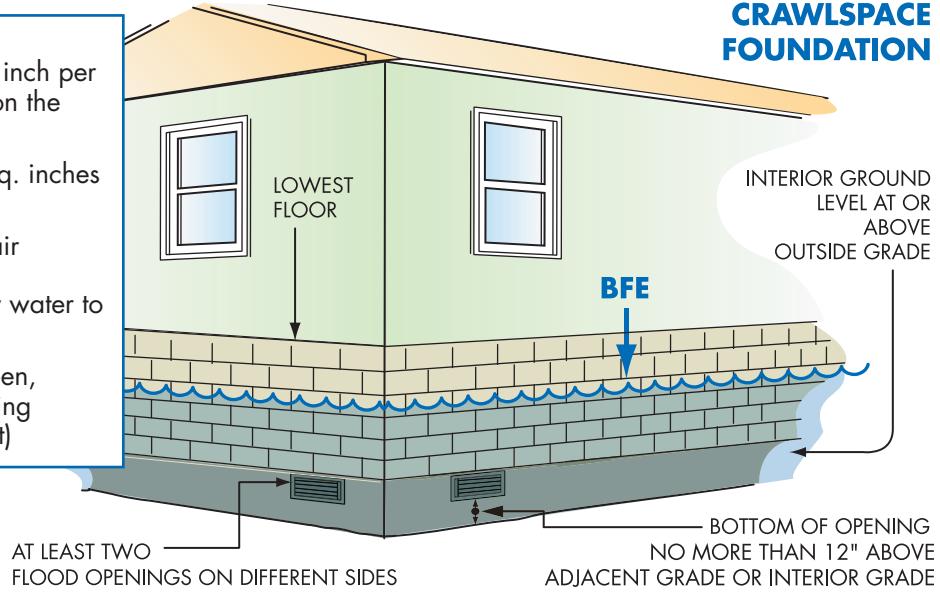
New buildings are not allowed to have basements below the BFE and Federal flood insurance coverage is very limited in existing basements for a very good reason. It only takes an inch of water over a door threshold or window sill and the entire basement fills up! Excavating a basement into fill doesn't always make it safe because saturated groundwater can damage the walls.

Enclosures Below the Lowest Floor (Zone A/AE)

NOTE:

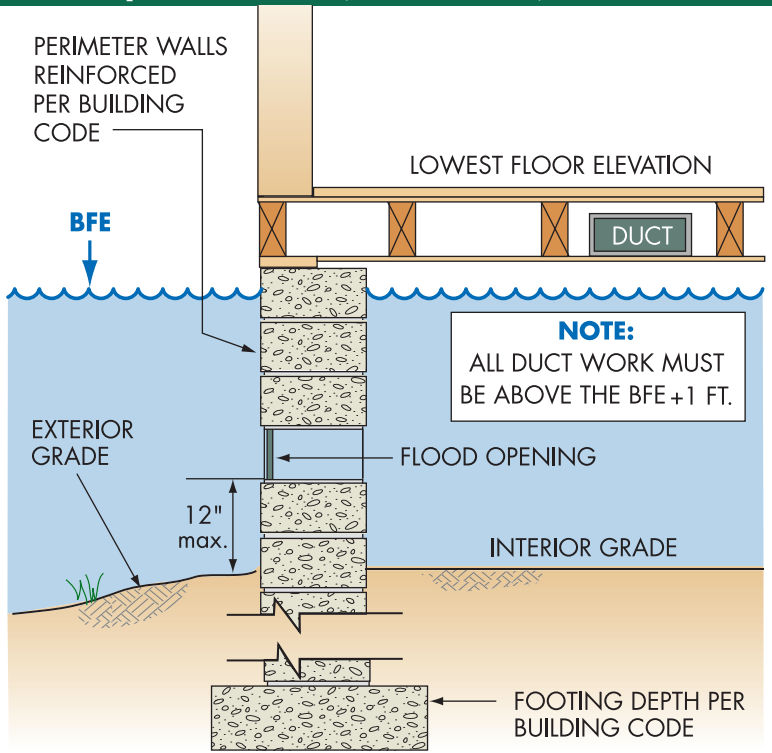
- Total net area of all openings is 1 sq. inch per sq. foot of enclosed area (measured on the outside)
- A 30' x 40' enclosure needs 1,200 sq. inches of openings
- If inserted in flood openings, typical air ventilation units must be permanently disabled in the open position to allow water to flow in and out
- A typical air ventilation unit, with screen, provides 42 to 65 sq. inches of opening (look for "net free area" stamp on unit)

ALTERNATIVE: Engineered openings are acceptable **if certified** to allow adequate automatic inflow and outflow of floodwater.



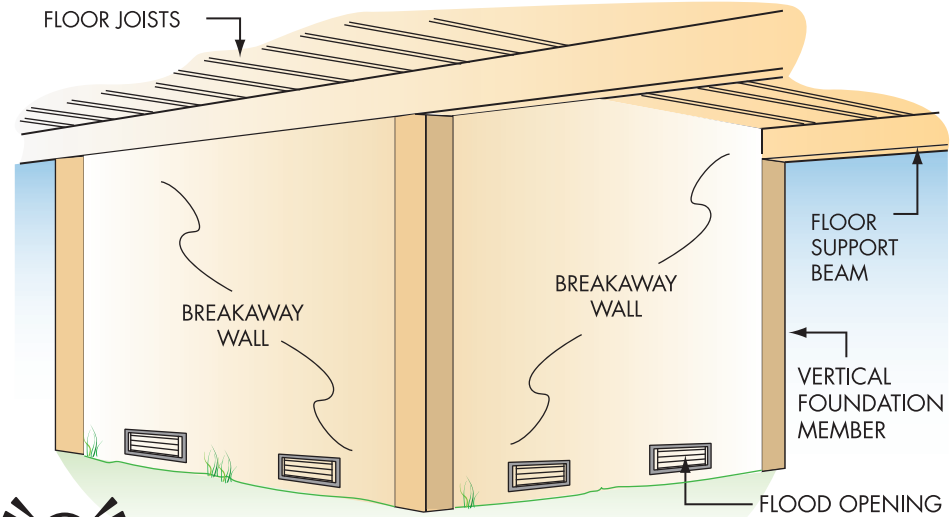
Solid perimeter wall foundations can enclose flood-prone space. A crawlspace is a good way to elevate just a couple of feet. The following are required: flood openings, elevated utilities, flood-resistant materials, and limitations on use.
See NFIP Technical Bulletin #1 *Openings in Foundation Walls and Walls of Enclosures.*

Crawlspace Details (Zone A/AE)



- The FBC requires the Lowest Floor at or above BFE plus 1 foot. Florida recommends another foot or more for greater protection.
- All materials below the lowest floor must be flood resistant.
- Flood openings must provide 1 sq. in. of net open area for every sq. ft. of area enclosed by the perimeter walls – or certified engineered openings may be used.
- A 30' x 40' building needs 1,200 sq. in. of net opening (non-engineered).
- The bottom of flood openings must be no more than 12 inches above the higher of the interior and exterior grades.
- Standard air ventilation units must be permanently disabled in the "open" position to allow water to flow in and out.
- Interior grade must be equal to or higher than exterior grade on at least one side.

Enclosures Below Zone V and CAZ Buildings



Enclosures under elevated buildings should be avoided. If small areas are enclosed, the FBC requires:

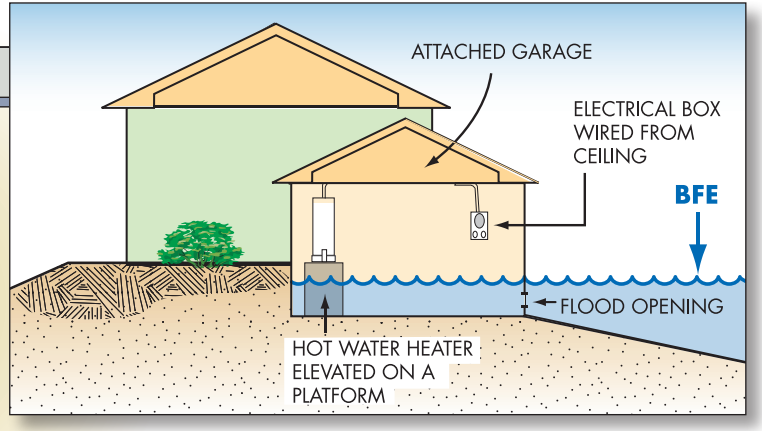
- Walls designed to collapse or "break away" under flood conditions and have flood openings
- Enclosures must be unfinished and made of flood resistant materials
- Utility wires and pipes must not go through or be attached to breakaway walls
- Enclosures must be used only for parking, limited storage, and building access (no bathrooms, recreation, or utility rooms)
- Minimal electric service for safety (light switch)

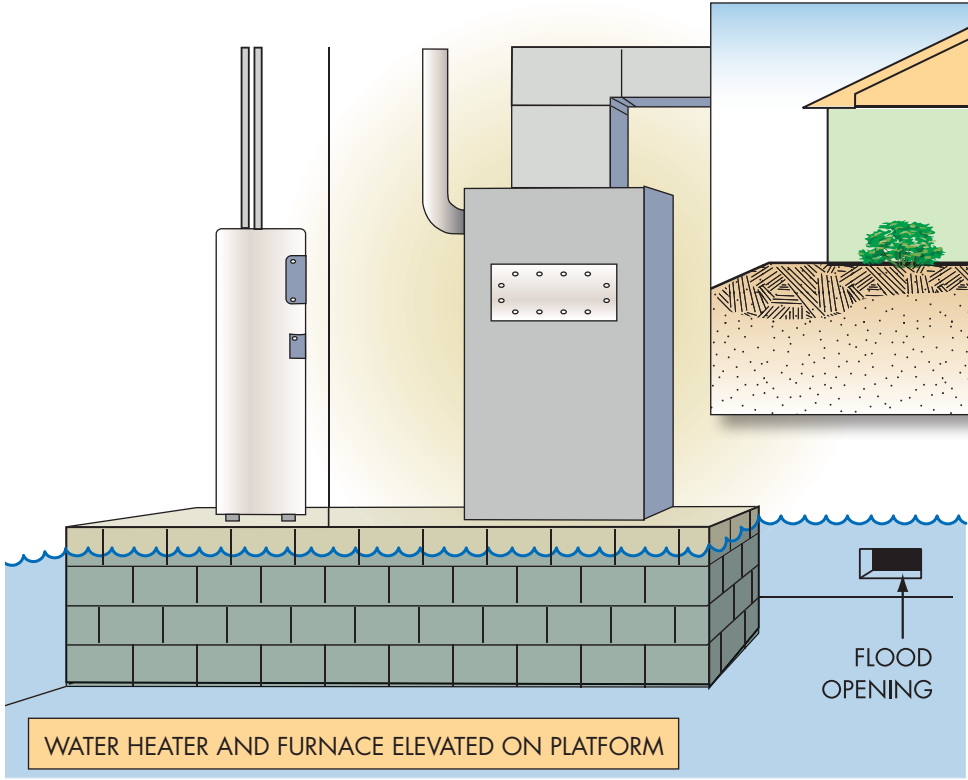
Enclosures larger than 299 sq. ft. may have higher insurance premiums.

Important Information

It is a violation of the FBC if enclosures below elevated buildings are modified or used for purposes other than parking, storage, and access. Not only will damage be increased during floods, but flood insurance policies will be more expensive.

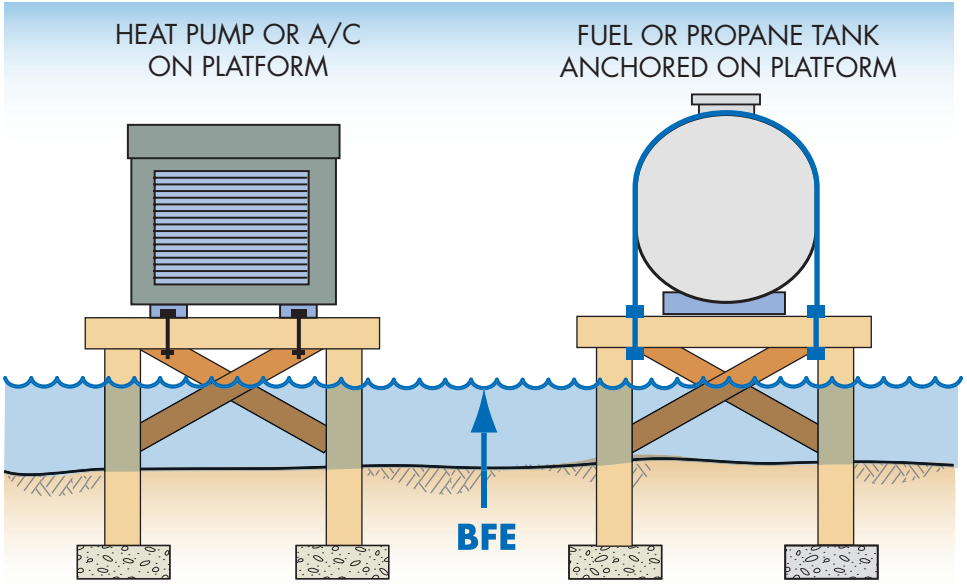
Utility Service and Equipment Inside Enclosures





Equipment (including duct work) must be elevated to or above the elevation required by the FBC. Utilities (plumbing, electrical, gas lines, heating, ventilating and air conditioning) must be elevated or designed and installed to prevent intrusion of floodwater into their components.

Utility Service, Equipment, and Tanks



Important Information

Fuel and propane tanks may explode or release contents during flooding. Even shallow water can create large buoyant forces on tanks. In all flood zones tanks may be underground or elevated on platforms or columns. In Zone A/AE only, tanks may be at-grade and anchored to resist flood loads.

The FBC has requirements for tanks in ASCE 24 and in R322.2.4 (Zone A) and R322.3.3.7 (Zone V and CAZ).

Whether inside an attached garage or outside the building, all utilities and equipment must be elevated above required elevation or protected against flood damage. Utilities include plumbing, electrical components, gas lines, tanks, and heating and air conditioning equipment.

Pools in Flood Hazard Areas

The type of flood zone and whether a pool is in-ground, above-ground, or a combination (perhaps with associated grading and fill) determine which requirements apply. The Florida Building Code has specific provisions:

- **Pools at private dwellings in flood Zone A/AE** have requirements only if the pool location is in a floodway or riverine flood hazard area where BFEs are specified but floodways have not been designated. [FBC Section R322.2.4]

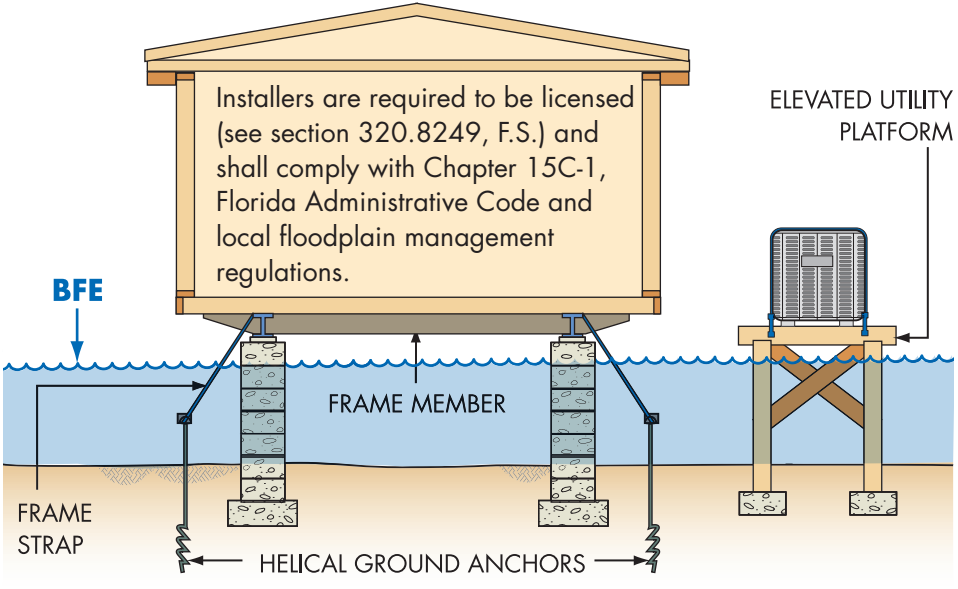
- **Pools at private dwellings in flood Zone V and CAZ** have more stringent requirements and must be designed in accordance with ASCE 24. [FBC Section R322.3.3.1]

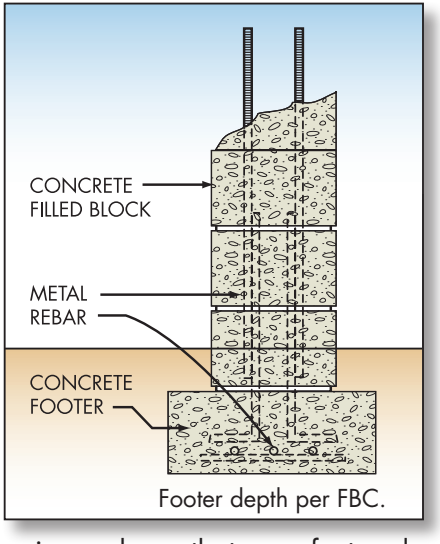
- **Public swimming pools and other private pools** must be designed to withstand all flood-related loads and load combinations. [FBC Sections 454 and 1612, which refers to ASCE 24]

- **Pool controls and equipment** must meet the requirements for utility service (see page 52).

For guidance on pools in Zone V and CAZ, see NFIP Technical Bulletin 5 *Free-of-Obstruction Requirements* and FEMA P-499 *Home Builders Guide to Coastal Construction.*

Manufactured Homes Require Special Attention





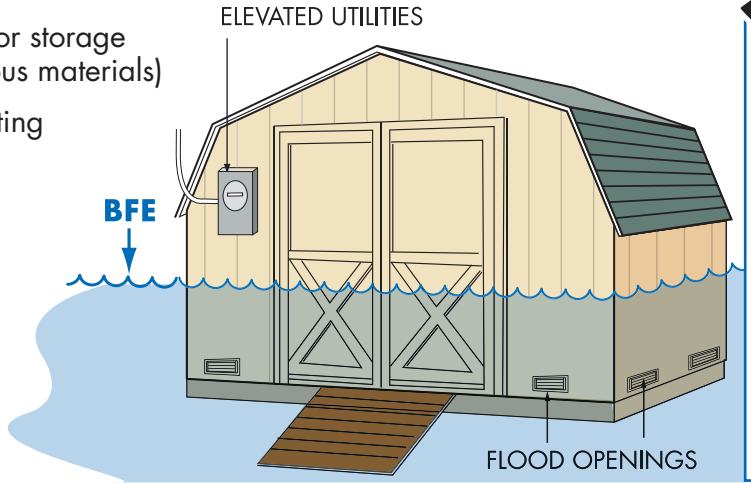
Experience shows that manufactured homes are easily damaged. Just a few inches of water above the floor can cause substantial damage.

Homes must be anchored to reinforced foundations to resist flotation, collapse, and lateral movement and must be tied down in accordance with community ordinances or the manufacturers' installation specifications for SFHAs. See guidance and some pre-engineered designs in FEMA P-85, *Protecting Manufactured Homes from Floods and Other Hazards*.

Accessory Structures

If not elevated, accessory structures in flood zones must:

- Not be habitable
- Be used only for parking or storage (not pollutants or hazardous materials)
- Be anchored to resist floating
- Have flood openings
- Be built of flood damage-resistant materials
- Have elevated utilities
- Not be modified for different use in the future



Terms and Definitions

Accessory Structure, defined in the FBC, Residential, is a structure not greater than 3,000 square feet in floor area and not over two stories in height, the use of which is customarily accessory to and incidental to a dwelling and which is located on the same lot as a dwelling.

Even small buildings are "development" and permits or variances with noted conditions are required. They must be elevated or anchored and built to withstand flood damage.
Caution! Remember, everything inside will get wet when flooding occurs.

Recreational Vehicles and Park Trailers

In Flood Zones, RVs and park trailers must:

- Be licensed and titled as an RV or park trailer (not as a permanent residence)
- Be built on a single chassis
- Must measure 400 sq.ft. or less (measured at largest horizontal projection)
- Have inflated tires and be self-propelled or towable by a light-duty truck
- Have no attached deck, porch, shed, or utilities
- Be used for temporary recreational, camping, travel or seasonal use (no more than 180 consecutive days)
- Have quick-disconnect sewage, water and electrical connectors

Important Information

Camping near the water?
Ask the campground or RV park operator about flood warnings and plans for safe evacuations.

RVs and park trailers that do not meet these conditions must be installed and elevated like manufactured homes, including permanent foundations and tie-downs (see page 54).

Improvements and Repairs of Buildings in Flood Zones

Permits to improve and repair buildings are required. Local officials must:

- Review costs estimated in construction contracts or other cost estimates (including estimate market value of owner labor and donated labor and materials).
- Estimate the market value using property assessment records or use an independent assessment of market value performed by a licensed appraiser.
- Compare the cost of improvements and repairs to the market value of the building.
- Require buildings to be brought into full compliance if the costs equal or exceed 50% of the market value, called Substantial Improvement.
- Encourage owners to consider other ways to reduce future damage if the comparison is less than 50% (see page 65).

Terms and Definitions

Substantial Improvement means any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds 50% of the market value of the structure before the start of construction of the improvement. This term includes structures which have incurred substantial damage from any cause (flood, fire, hurricanes, tornadoes, etc.), regardless of the actual repair work performed (see page 62). Some Florida communities track improvements over a period of time and trigger compliance when the cumulative improvement value equals or exceeds 50%.

Important Information

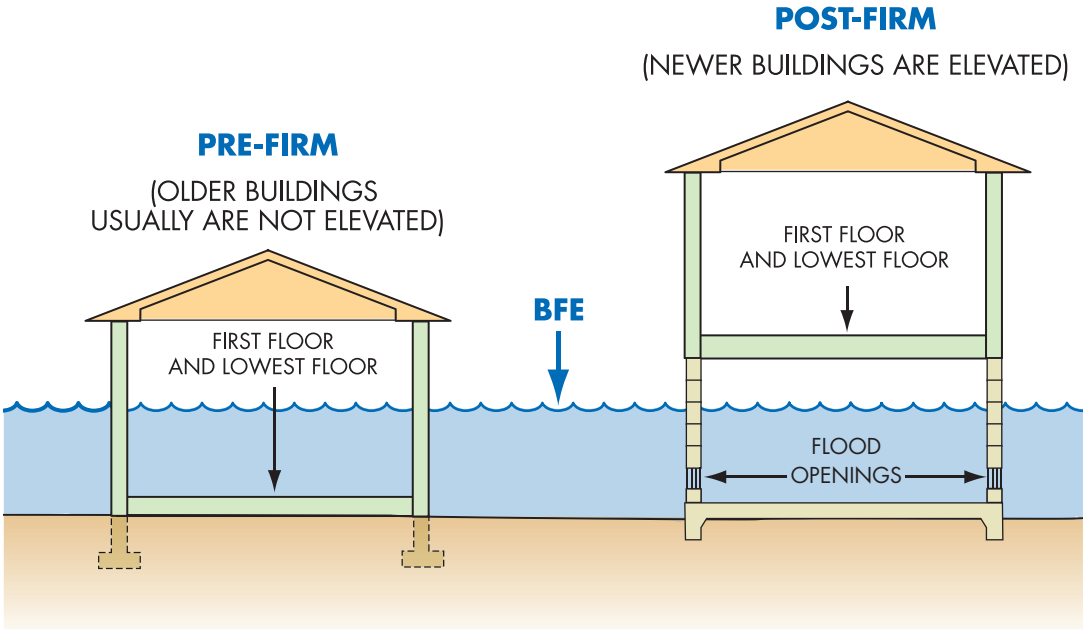
Improvements include:

- Renovation/ rehabilitation of the interior of the existing building (see page 59)
- Lateral addition, without renovation or structural alteration of the existing building (see page 60)
- Lateral addition, with renovation or structural alteration of the existing building (see page 61)
- Vertical addition (add new story)

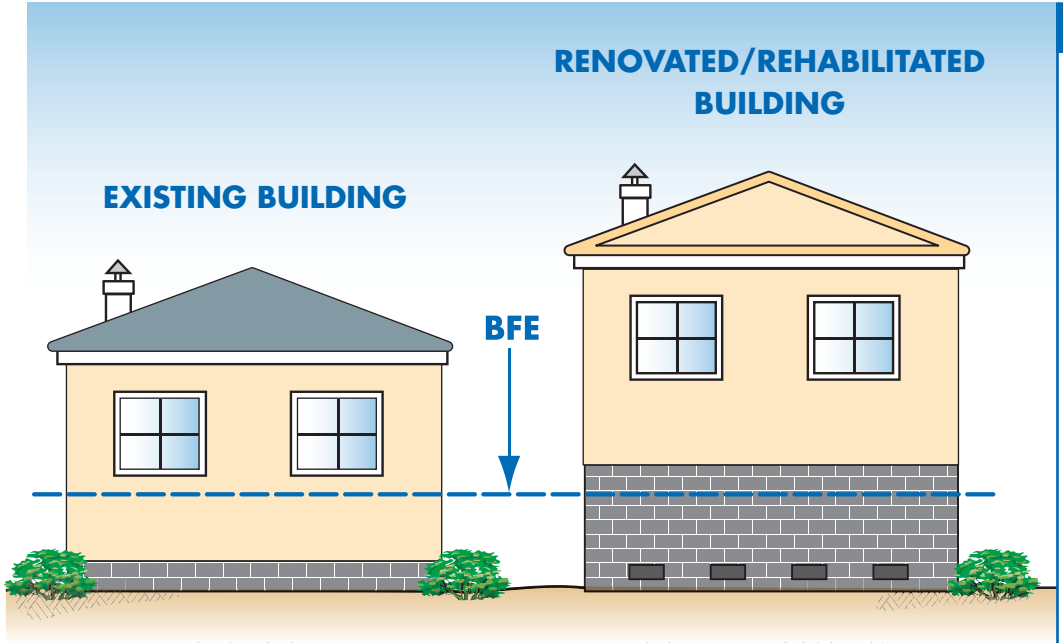
What is Meant by Pre-FIRM and Post-FIRM?

Pre-FIRM and **Post-FIRM** are insurance terms tied to a community's initial FIRM. The terms are used to determine flood insurance rates. Although common, the terms should not be used to distinguish between new construction built before a community joined the NFIP and those built after, especially in communities where the FIRMs have been revised.

The FBC Existing Building Code specifies when permits are required for work on existing buildings. Buildings must be brought into compliance when work is determined to be substantial improvement or repair of substantial damage.



Substantial Improvement: Renovation Only



SHALLOW CRAWLSPACE FOUNDATION

RAISED FULLY-COMPLIANT CRAWLSPACE FOUNDATION

(SEE PAGE 63)

Important Information

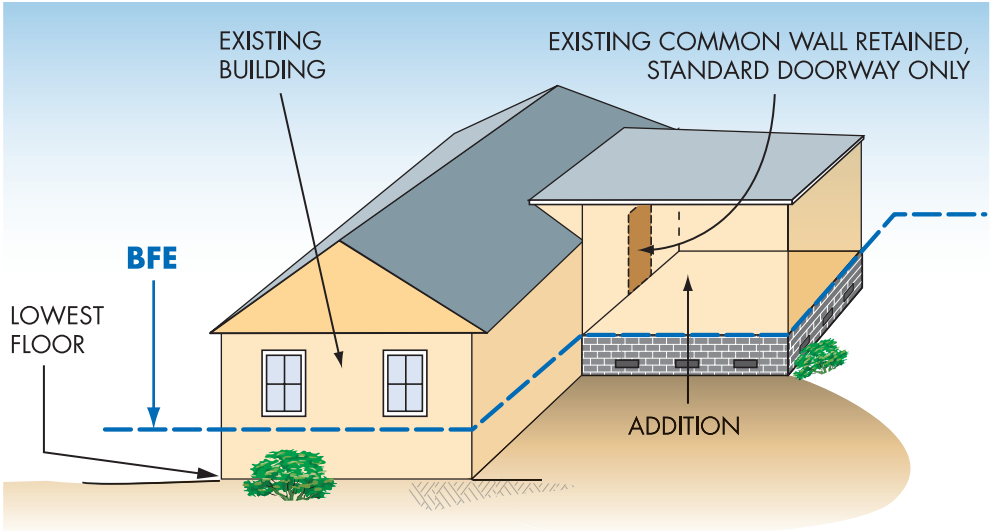
Floodplain buildings can be improved, renovated, rehabilitated or altered, but special rules apply.

Consult local permit offices before beginning work. Provide complete information about all proposed work.

If local code officials have cited violations of State or local health, sanitary, or safety codes, minimum costs to correct violations to provide safe living conditions can be excluded from the cost of renovations.

Alteration of registered historic structures are allowed, by variance, as long as the structures continue to meet the criteria for listing as historic structures.

Substantial Improvement: Lateral Addition Only



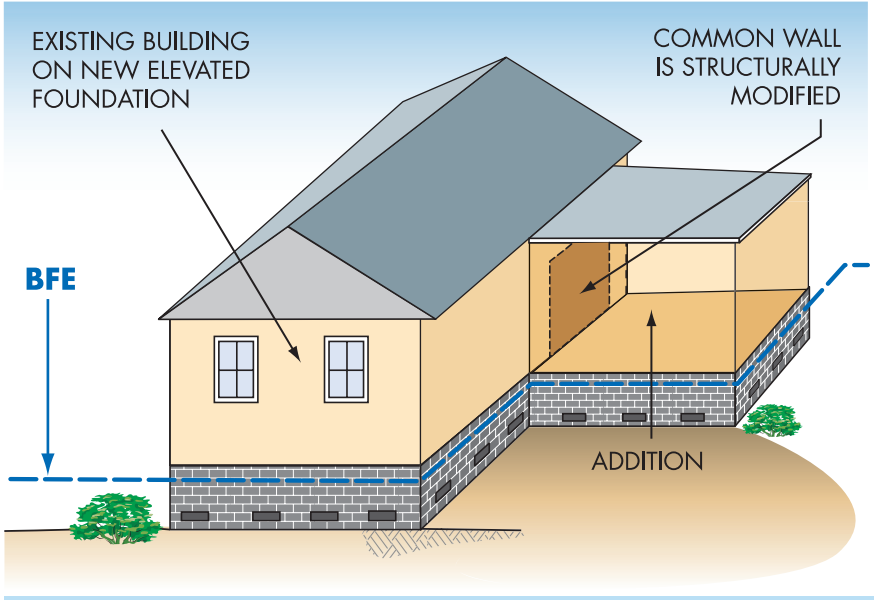
Important Information

See page 61 for projects to add lateral additions that also modify the interior of the existing building or make structural modifications to the existing common wall.

Permits are required to build additions to buildings in flood zones. Only the addition must be elevated and comply with the FBC, provided:

- There are no other modifications to the existing building, and
- There are no structural modifications to the existing common wall other than adding a standard 36" doorway

Substantial Improvement: Addition Plus Other Work

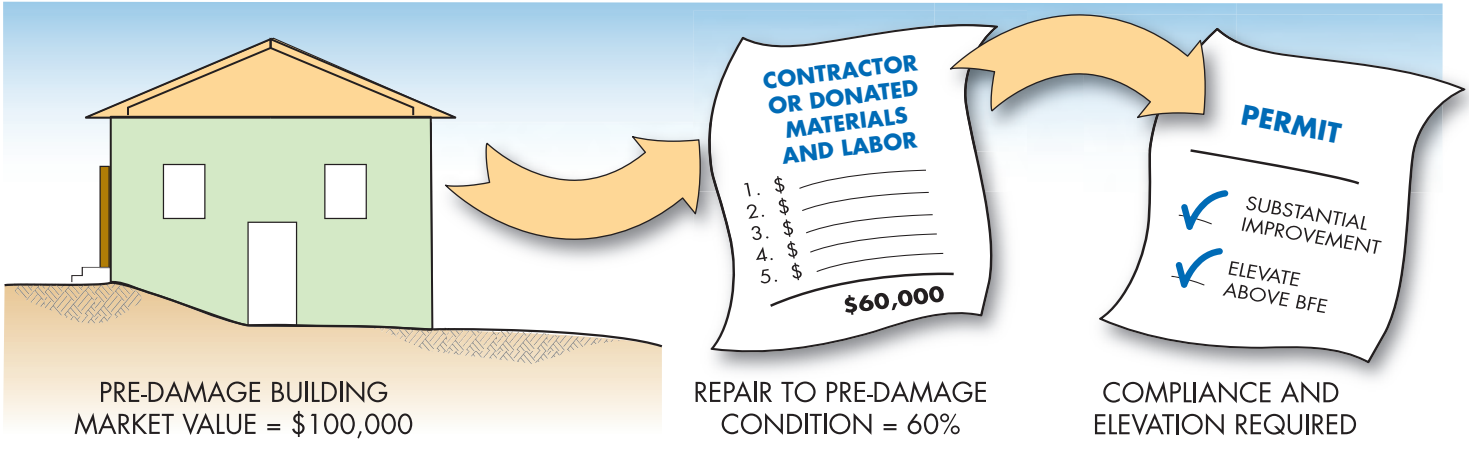


Communities must prepare evaluations to determine if all proposed work will trigger the substantial improvement requirement. Substantial improvement is triggered if:

- The work involves adding a new top floor, modifying the interior of the existing building, or structural modifications to the existing common wall (for lateral addition); and
- The cost of all proposed work plus the cost of improvements equals or exceeds 50% of the market value of the existing building.

Community permit offices can help determine which requirements apply when buildings must be brought into compliance. A preliminary review of proposed improvements is recommended before projects are designed and before permit applications are submitted.

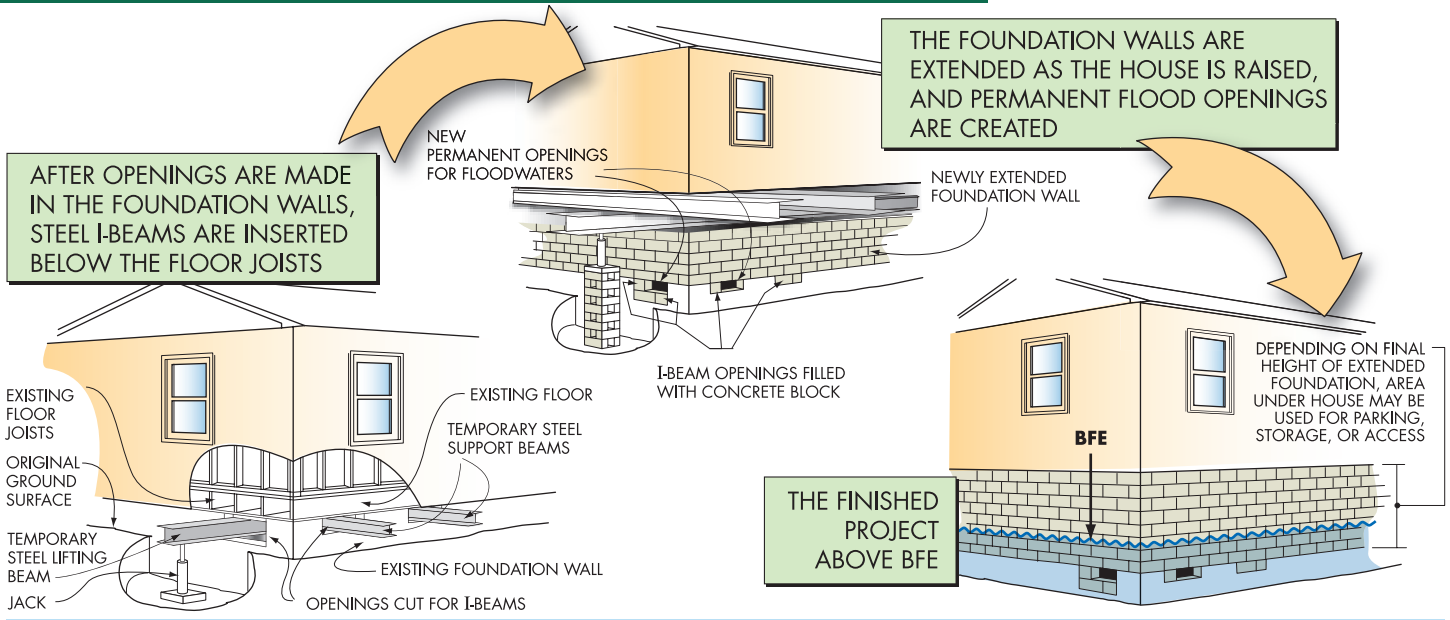
Repair of Damaged Buildings



Permits are required to repair damaged buildings, regardless of the cause – fire, flood, wind, or even vehicle impact. Detailed estimates of the cost to repair a building to pre-damage condition are required. If the costs are 50% or more of the pre-damage market value of the building, then it is "substantially damaged" and must be brought into compliance, which may involve raising the foundation and other measures. Consult with local permit offices before repairs are started.

See page 63 for an example of elevating an existing building above a crawlspace.

Elevating an Existing Building



This is one way to elevate an existing building to comply with building code and floodplain regulations (also see FEMA P-312, *Homeowner's Guide to Retrofitting*). If an NFIP-insured building is damaged by flood and the community determines it is substantially damaged, the owner may be eligible for an **Increased Cost of Compliance** payment (see page 64).

Paying for Post-Flood Compliance

Owners may be eligible for up to $30,000 to help pay to bring buildings into compliance with building code and community requirements – if all of the following apply:

- Buildings are located in a mapped flood zone
- Buildings are covered by Federal flood insurance, which includes Increased Cost of Compliance coverage
- Buildings have lowest floors below the elevation required by the FBC
- The community has made an official determination that buildings were substantially damaged by flooding
- Owners act quickly with their claims adjusters and community officials to process all required paperwork

Learn more at www.fema.gov/increased-cost-compliance-coverage.

Owners whose buildings are substantially damaged are required to "bring the building into compliance" with flood zone requirements. Substantial damage is a special case of substantial improvement.

USE THE ICC CLAIM TO:

ELEVATE-IN-PLACE

RELOCATE TO HIGH GROUND

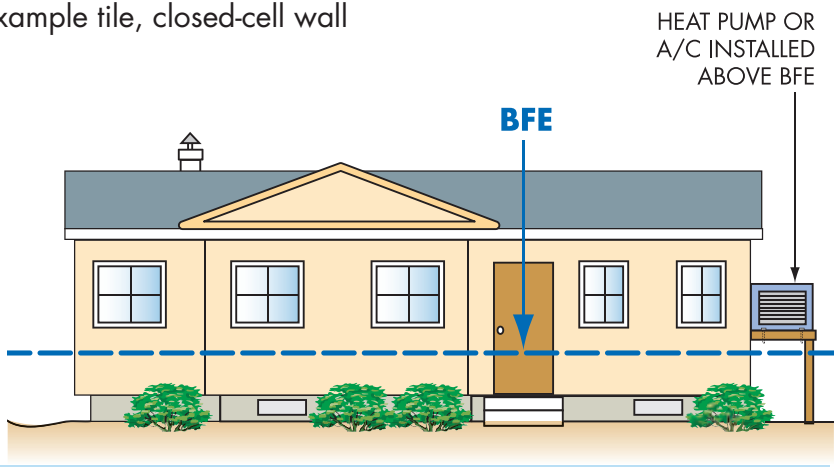
DEMOLISH

FLOODPROOF (NON-RESIDENTIAL ONLY)

Non-Substantial Improvements

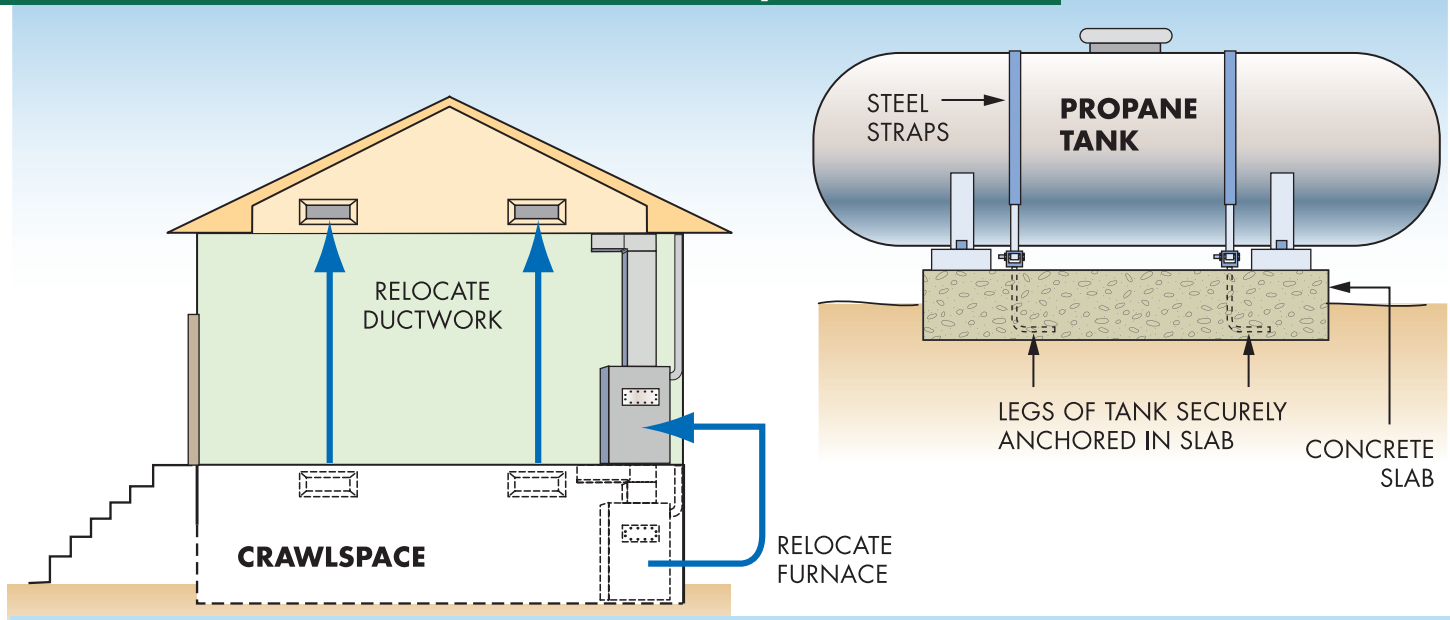
Proposed improvements are "non-substantial" if the costs are less than 50% of the market value of the building. In these cases, buildings are not required to be brought into compliance. However, there are many things owners can do to reduce exposure to future flooding. Owners should consider the following:

- Use flood damage-resistant materials, for example tile, closed-cell wall insulation, and polyvinyl wall coverings
- Raise air conditioning equipment, heat pumps, furnaces, water heaters, and other appliances on platforms
- Move electric outlets higher above the floor
- Add flood openings to crawlspace foundations
- Move ductwork out of crawlspaces
- Fill in below-grade crawlspace



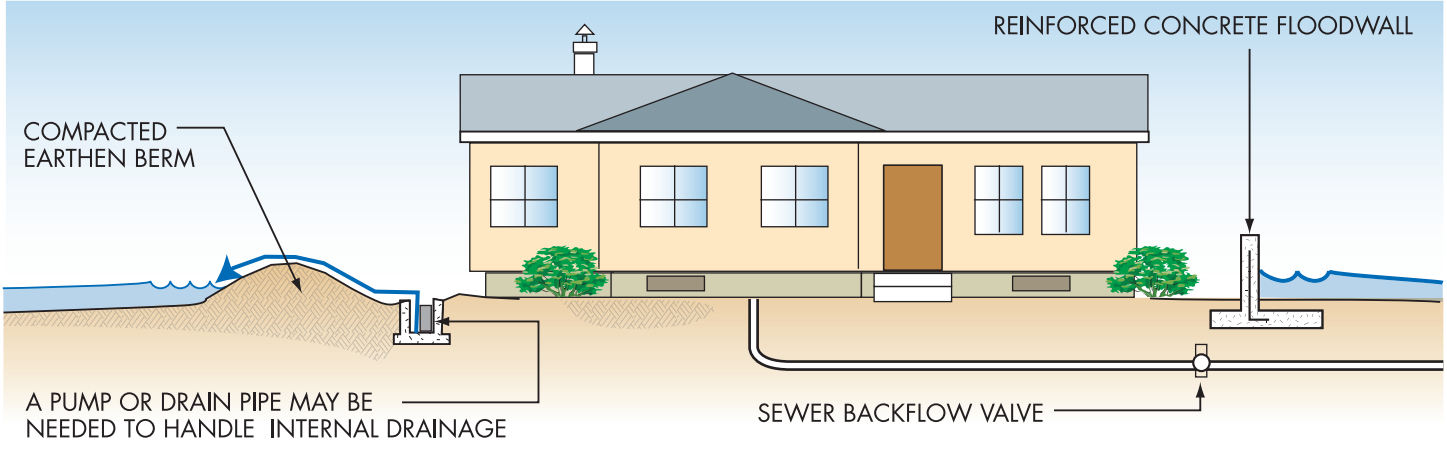
Note! ALL proposed work must be included in permit applications. If more work is proposed or undertaken after a permit is issued, community officials must determine whether the additional work changes the substantial improvement determination.

Some Flood Protection for Older Homes is Easy and Low Cost



Move fuse boxes, water heaters, furnaces, and ductwork out of crawlspaces and basements.
Anchor heating oil and propane gas tanks to prevent flotation and lateral movement.
Do not store valuables or hazardous materials in a flood-prone crawlspace or basement.
Use water-resistant materials when repairs are made.

Small Berms or Floodwalls May Protect Older Buildings



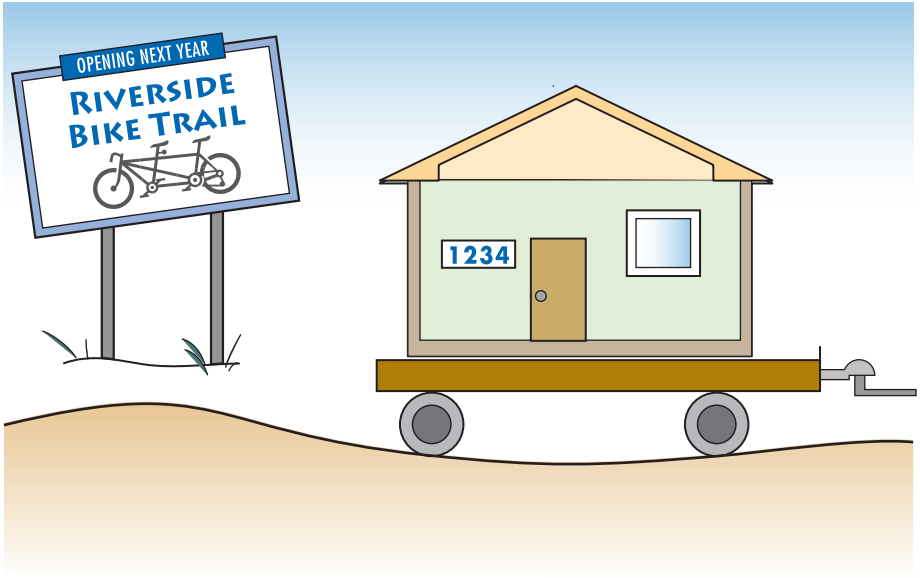
In areas where floodwater isn't expected to be deep, sometimes individual buildings can be protected by earthen berms or concrete floodwalls. Permits are required for these protection measures and extra care must be taken if sites are in floodways (see page 12). Small berms or floodwalls cannot be use to achieve compliance for new construction, substantially improved buildings, or substantially damaged buildings.

Important! These protective measures will not reduce your flood insurance premium!

Some Flood Mitigation Projects are More Costly

But Give More Protection

After floods, some communities purchase and demolish homes that were severely damaged. The acquired land is dedicated to stormwater storage or open space and can be used for recreation or to help restore wildlife habitat and wetlands. Some homes have been elevated on new, higher foundations, and others have been moved to safer high ground outside of flood zones.



The Florida Division of Emergency Management administers FEMA mitigation grant programs. Learn more at www.floridadisaster.org/Mitigation/index.htm.

Be Prepared for Flood Emergencies

Everyone should be prepared for floods and other emergencies. Preparation begins at home, at work places, at schools, and in communities.

GET A PLAN!
FLGetAPlan.com
Florida Division of Emergency Management

Sometimes floods and other disasters can strike quickly and without warning and evacuation may be required. Basic services (water, gas, electricity and telephones) may be interrupted, perhaps for several days. Local officials and emergency relief works will be on the scene after disasters, but they cannot reach everyone right away. Communities, families, and businesses should prepare before disasters occur by:

- Learning about natural hazards (Florida communities participate in developing Local Mitigation Strategies)
- Making family and workplace emergency plans
- Knowing where to go if evacuations are required
- Putting together disaster kits with supplies to last a few days

To learn more about preparing for disasters, visit the Florida Division of Emergency Management at www.floridadisaster.org and contact local emergency management agencies.

Useful Resources and Common Acronyms

- Florida State Floodplain Management Program, NFIP State Coordinator, and resources for local officials: www.floridadisaster.org/Mitigation/SFMP
- Excerpts of the flood provisions of the FBC: www.floridadisaster.org/Mitigation/SFMP/lobc_resources.htm
- Florida's Community Rating System program: www.floridadisaster.org/mitigation/CRS
- NFIP regulations, Title 44 CFR: www.fema.gov/national-flood-insurance-program/laws-and-regulations
- NFIP Technical Bulletins: www.fema.gov/floodplain-management/nfip-technical-bulletins/4
- CRS Resources: www.fema.gov/national-flood-insurance-program-community-rating-system
- Florida Floodplain Management Association: www.flfloods.org
- Building Officials Association of Florida: www.boaf.net
- Get a Plan! www.floridadisaster.org/family

Common Acronyms

- BFE = Base Flood Elevation
- EC = Elevation Certificate
- FBC = Florida Building Code
- FIRM = Flood Insurance Rate Map
- ICC = Increased Cost of Compliance
- NFIP = National Flood Insurance Program
- SFHA = Special Flood Hazard Area (100-year floodplain)

Want to Learn More?

- For information and advice on permits, contact local building or planning departments.
- For advice on permitting and managing floodplains, contact the State Floodplain Management Office at floods@em.myflorida.org or (850) 815-4556.
- For flood zone permit applications, SI/SD determinations, letters to HVAC and tank companies, visit www.floridadisaster.org/mitigation/CRS-CAV-pilotprogram.
- For information about workshops, training and conferences, contact the Florida Floodplain Management Association at www.flfloods.org.
- To learn more about flood maps, go to www.fema.gov/national-flood-insurance-program-flood-hazard-mapping.
- FEMA's on-line publications can be found in the FEMA Library (www.fema.gov/library/) or by using an Internet search engine to search on the publication number or title.
- To learn about Federal flood insurance, call an insurance agent. Most insurance companies can write NFIP policies.
- To learn the importance of taking steps to financially protect homes and businesses from flood damage go to www.floodsmart.gov.
- Find out about Elevation Certificates and training for surveyors by searching for Elevation Certificate at www.fema.gov.

This **Quick Guide** may be downloaded from the
Florida Division of Emergency Management web site at:
www.floridadisaster.org/Mitigation/SFMP/Index.htm

or

the **Florida Floodplain Managers Association** website at:
www.flfloods.org