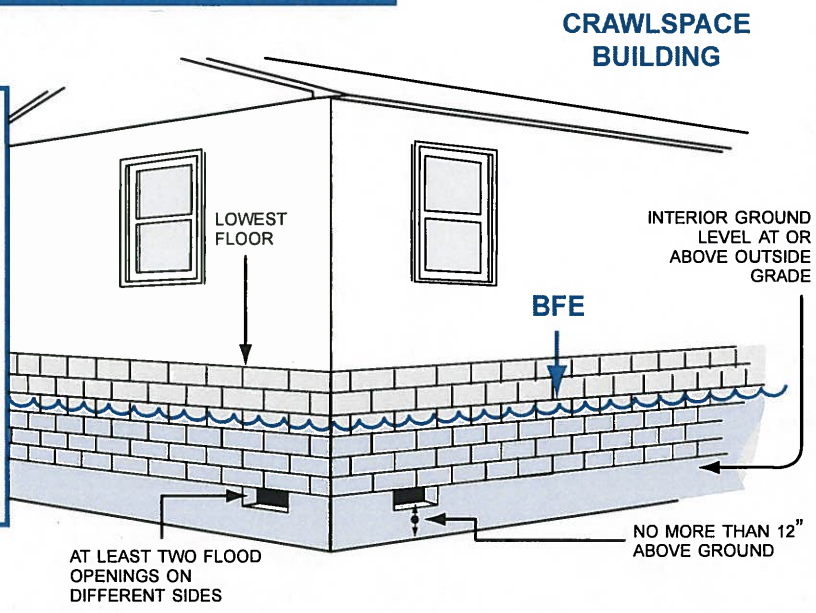
Enclosures Below the Lowest Floor

Important Information

NOTE:

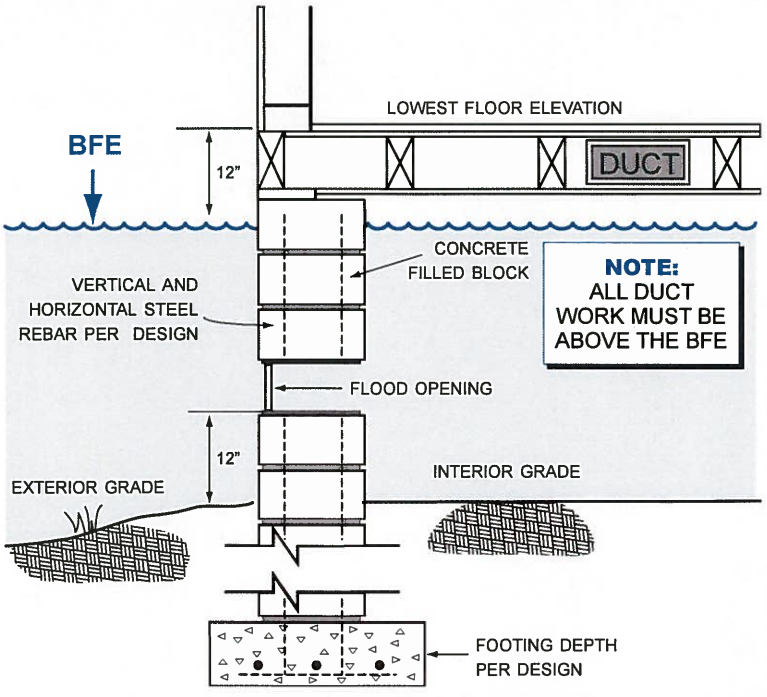
- Total net area of all total openings is 1 sq. in. per sq. ft. of enclosed area.
- A 25' x 45' building needs 1,125 sq. inches of openings.
- Standard ventilation units used in foundation walls must be disabled in the open position to allow water to flow in and out.
- A standard ventilation unit with screen, provides 42 to 65 sq. inches of opening.

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



Solid perimeter walls can enclose floodprone areas. A crawlspace is a good way to elevate just a couple of feet. In all cases the following are required: flood openings, utilities elevated to or above the BFE, flood resistant materials and limitations on use of enclosures below the lowest floor. Check with the local permit office for details and restrictions.

Crawlspace Details

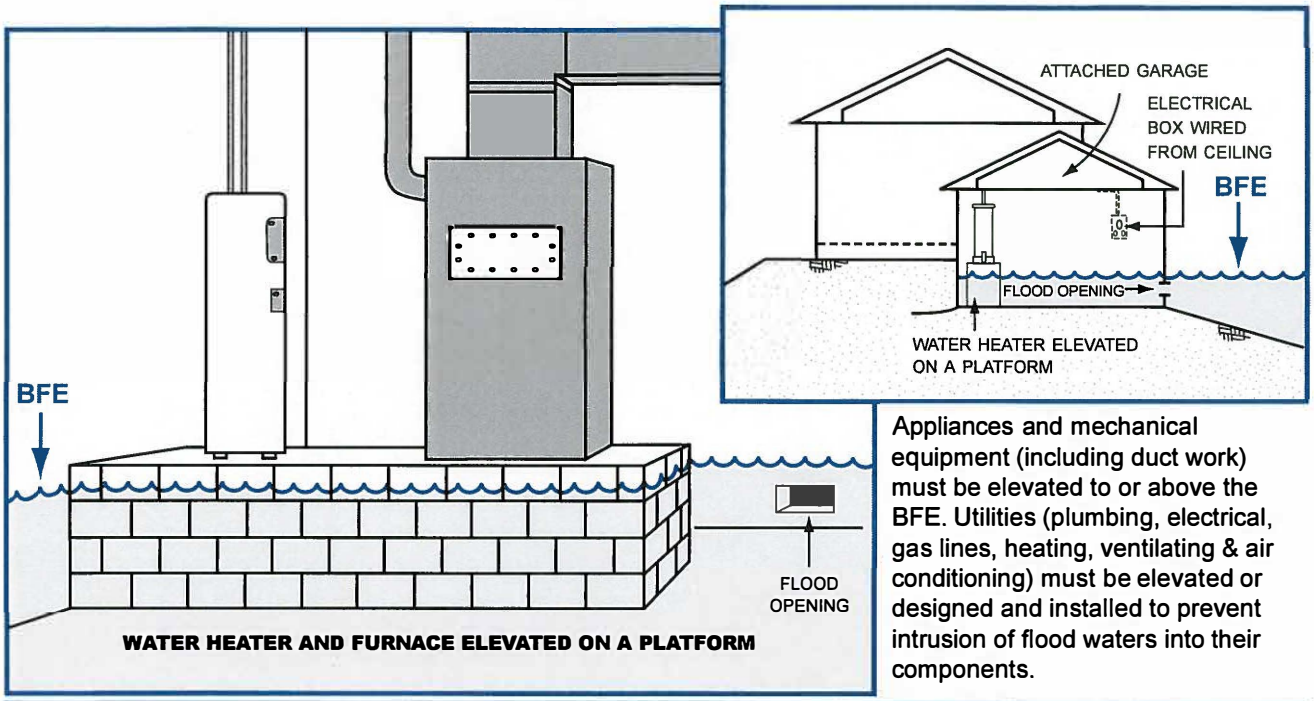


- The Lowest Floor Elevation must be at or above the BFE.
- The bottom of flood openings must be no more than 1 foot above the grade.
- Standard ventilation units must be permanently disabled in the "open" position to allow water to flow in and out.
- Interior and exterior grades should be equal on at least one side.

Calculate Net Flood Opening:

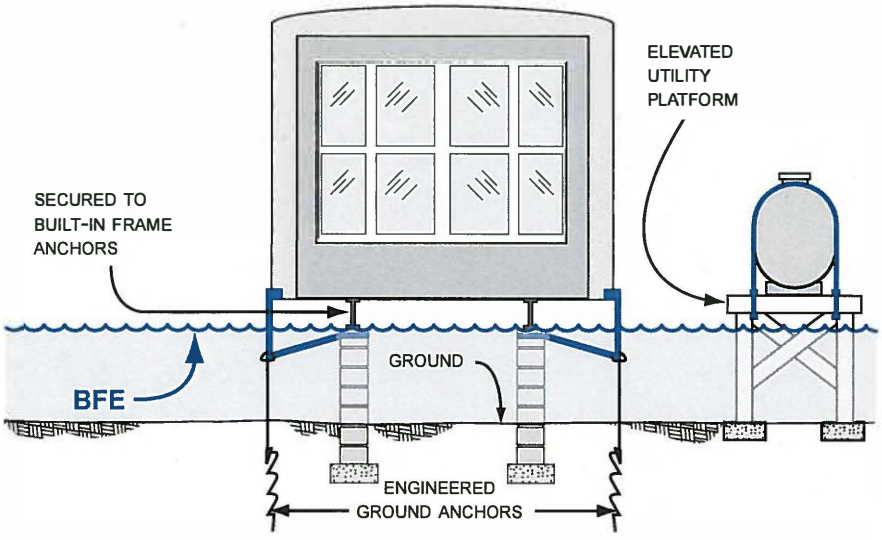
A building that measures 25' x 45' has 1,125 square feet of enclosed crawlspace. Flood vents must provide 1,125 sq. in. of net open area (or have certified engineered openings). If a standard air vent unit provides 60 sq. in. of net open area, then to satisfy the flood opening requirement 19 vent units are required (1,125 divided by 60).

Utility Service Inside Enclosures



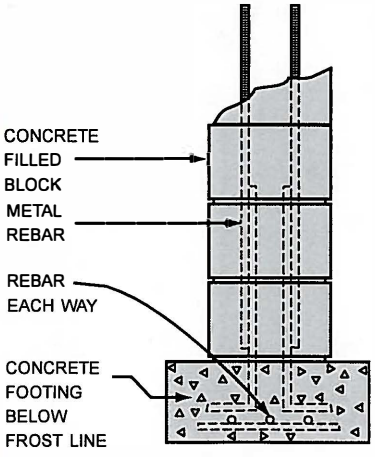
Appliances and mechanical equipment (including duct work) must be elevated to or above the BFE. Utilities (plumbing, electrical, gas lines, heating, ventilating & air conditioning) must be elevated or designed and installed to prevent intrusion of flood waters into their components.

Manufactured Homes Deserve Special Attention



Experience shows that manufactured homes are easily damaged. As little as one foot of water can cause substantial damage.

Dry stacked blocks are not acceptable. They will **NOT** withstand a flood.



Manufactured homes must be anchored to resist flotation, collapse and lateral movement by being tied down in accordance with your community's floodplain ordinance.

Recreational Vehicles

In a Special Flood Hazard Area, a Recreational Vehicle (RV) must:

- Remain on site for fewer than 180 consecutive days, **and**
- Be fully licensed and ready for highway use; **or**
- Meet the permitting, elevation, and anchoring requirements for manufactured homes of the community's Flood Damage Prevention Ordinance.

A recreational vehicle is ready for highway use if it is on its wheels or jacking system, is attached to the site only by quick-disconnect type utilities and security devices, and has no permanently attached additions.

Important Information

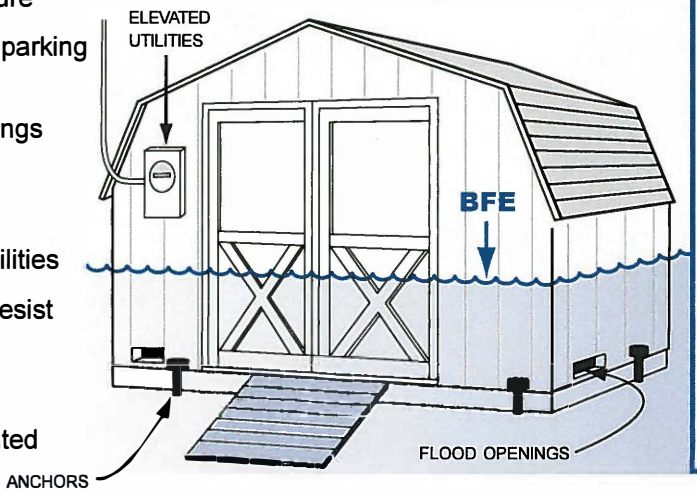
Camping near the water? Ask the campground or RV Park operator about flood warnings and plans for safe evacuations.

RVs that do not meet these conditions must be installed, elevated, and secured like a manufactured home, including a permanent foundation and tie-down.

Accessory Structures

Accessory Structures in a Special Flood Hazard Area:

- Cannot be modified for a different use in the future
- Must be used only for parking or storage
- Must have flood openings
- Must be built of flood resistant materials
- Must have elevated utilities
- Must be anchored to resist floating
- Must not be inhabited
- Must have a documented floor elevation



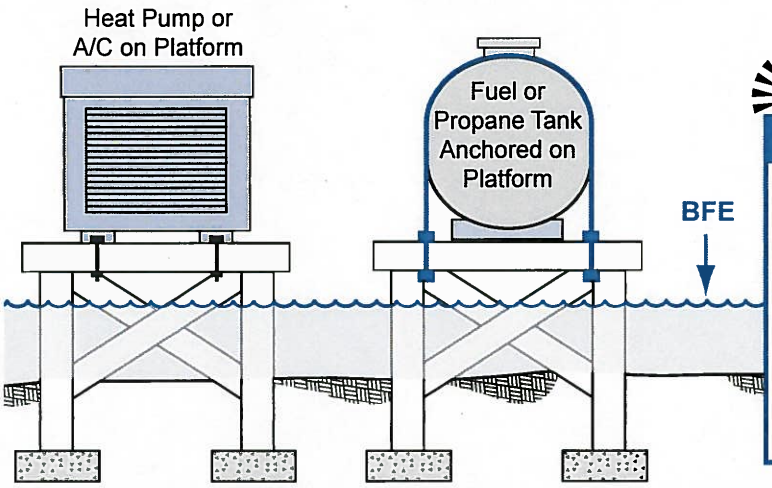
Terms and Definitions

Accessory (Appurtenant) Structure means a structure that is located on the same parcel of land as a principle structure and whose use is incidental to the use of the principal structure. Accessory structures should be no more than a minimal initial investment, may not be used for human habitation, and must be designed to minimize flood damage. Examples include: detached garages, carports, storage sheds, pole barns, and hay sheds.

Even small buildings are considered "development" and permits or variances with noted conditions are required. **CAUTION!** Remember...everything inside is likely to get wet when flooding occurs.

Utility Service / Fuel Tanks

All utilities, appliances, and equipment must be elevated to or above the BFE. Utilities include plumbing, electrical, gas lines, fuel tanks, and heating, ventilating and air conditioning equipment.



Important

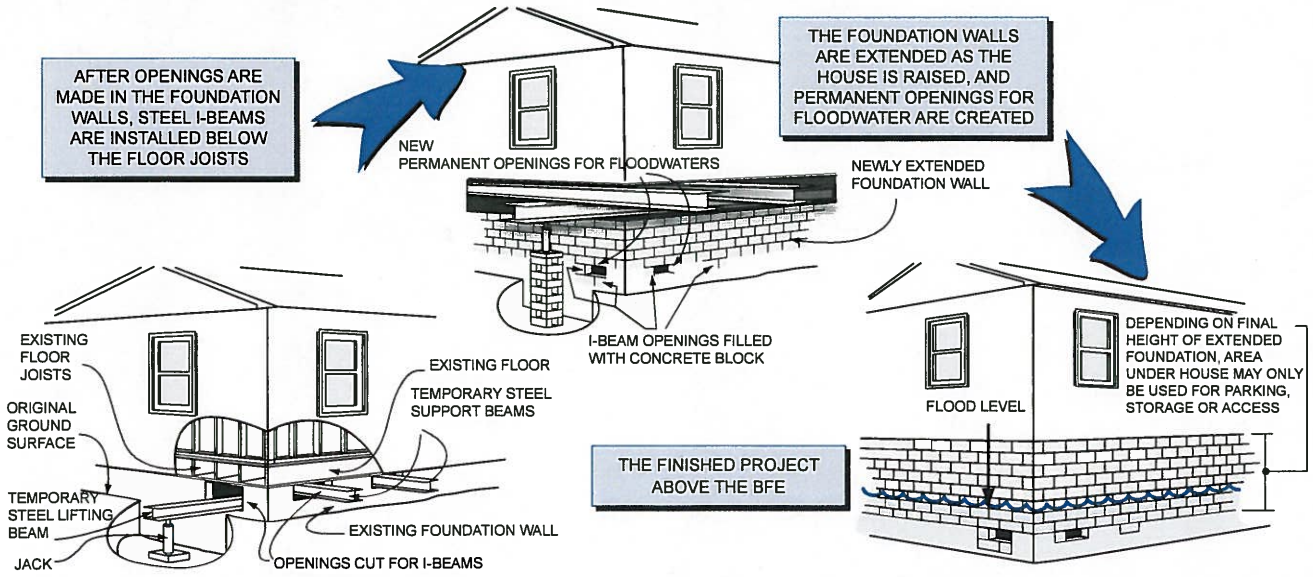
Information

For floodplain management purposes, a gas or a liquid storage tank that is principally above ground is considered a structure and must be elevated to or above the BFE.

Fuel and propane tanks may cause explosion and pollution risks during floods. Even shallow water can create significant buoyant forces on tanks so extra care must be taken to ensure that all tanks are appropriately anchored.

Fuel and propane tanks can pose serious threats to people, property, and the environment during flood conditions. Even shallow water can create a large buoyant force on tanks. Videos on "Fuel Tank Flood Hazards" and "How to Anchor Home Fuel Tanks" are available from FEMA Publications at 1-800-480-2520 and "How-To Guides" on anchoring fuel tanks and other flood damage reduction techniques are available at: http://www.fema.gov/library/viewRecord.do?id=3262.

Elevating an Existing Structure

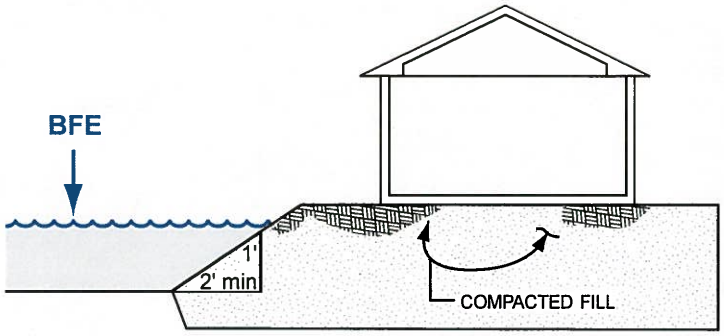


This is one way to elevate an existing building to comply with floodplain regulations. See *Above the Flood: Elevating Your Floodprone House* (FEMA 347) for additional information. If your insured building is damaged by flood and your community determines it is substantially damaged, you may be eligible for an **Increased Cost of Compliance** payment.

Compaction of Floodplain Fill

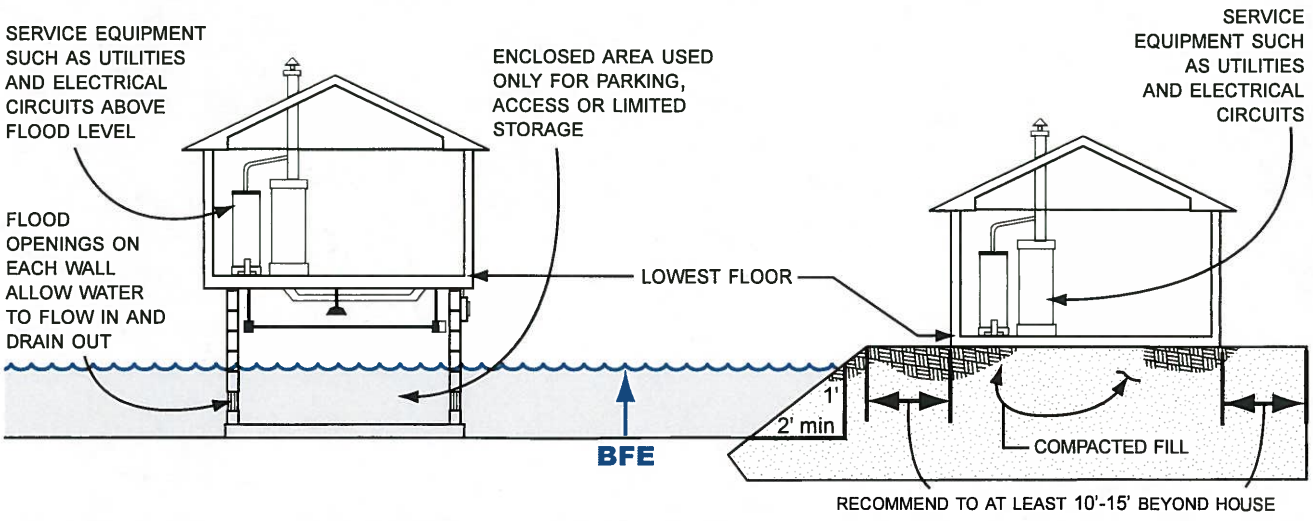
Earthen fill used to raise the ground above the flood elevation must be placed properly so that it does not erode or slump when water rises. For safety and to meet floodplain requirements, floodplain fill should:

- Be good clean soil, free of large rocks, construction debris, and woody material (stumps, roots).
- Have graded side slopes not steeper than 2:1, (one foot of vertical rise for every 2 feet of horizontal extent); flatter slopes are recommended. If steeper than 2 to 1 engineering analysis is required.
- Be machine compacted to 95 percent of the maximum density (determined by a design professional).
- Have slopes protected against erosion (vegetation for "low" velocities, durable materials for "high" velocities determined by a design professional).



Your community may ask for certification of the elevation, compaction, slope and slope protection materials. Your engineer or design professional can find more information in FEMA's technical guidance for Letters of Map Revision based on Fill (FEMA Form MT-1) and in NFIP Technical Bulletin #10.

How to Elevate Your Floodplain Structure

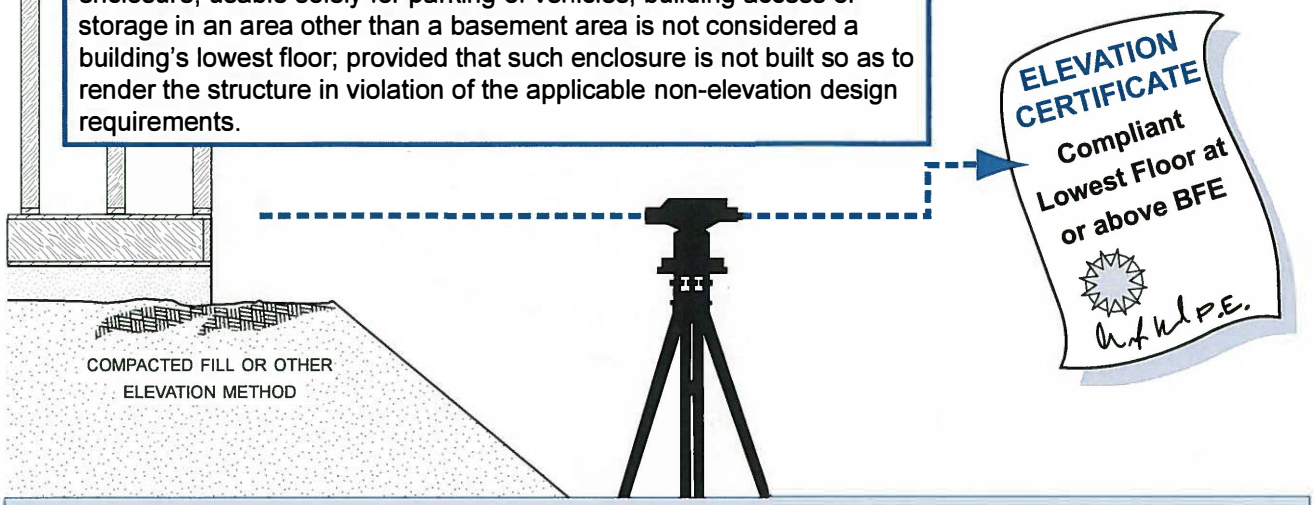


CAUTION: Enclosures (including crawlspaces) must meet special design requirements (see pages for crawlspaces). NOTE: When the walking surface of the lowest floor is at the minimum elevation, under floor utilities are not allowed.

The Lowest Floor

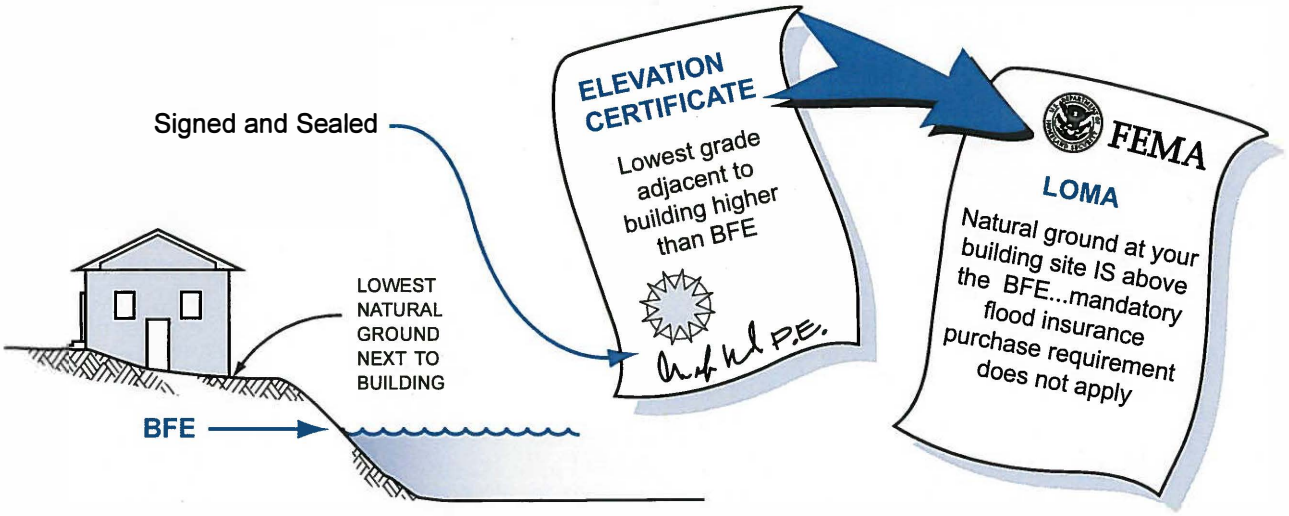
Terms and Definitions

Lowest Floor - the lowest floor of the lowest enclosed area (including basement). An unfinished or flood resistant enclosure, usable solely for parking of vehicles, building access or storage in an area other than a basement area is not considered a building's lowest floor; provided that such enclosure is not built so as to render the structure in violation of the applicable non-elevation design requirements.



If the lowest floor of a structure is at or above the BFE, a completed Elevation Certificate can be used to get lower cost flood insurance.

Is Your Building Site Higher than the BFE?



If your land is shown on the maps as "in" the floodplain but your building site is higher than the BFE, get a surveyor or Professional Engineer authorized by the Commonwealth of Kentucky to certify elevations, to complete the Elevation Certificate and seal it. Submit the EC with an application to FEMA and a LOMA may be issued. This is the **ONLY** way to remove the requirement to purchase flood insurance. Keep the certificate and the LOMA with your deed, it will help future buyers.

What is an Elevation Certificate and How is it Used?

- The Elevation Certificate (EC) is a FEMA form. Download a copy from http://www.fema.gov/business/nfip/forms.shtm.
- When the floodplain has BFEs, the EC must be completed and sealed by a surveyor, architect or Professional Engineer authorized by the Commonwealth of Kentucky to certify elevations.
- The EC can be used to show that sites are located on natural ground above Base Flood Elevation (see page 35).
- The EC is used to verify that buildings are elevated properly (see page 36).
- Insurance agents use the EC to rate/write flood insurance policies.
- Once your EC is completed, provide a copy to your lending organization, to your insurance provider, and to your local floodplain manager. Keep the original for your records.

By itself, the EC cannot be used to waive the requirements to get flood insurance. Speak to your local Floodplain Administrator for more information about LOMAs.

Completing the Elevation Certificate

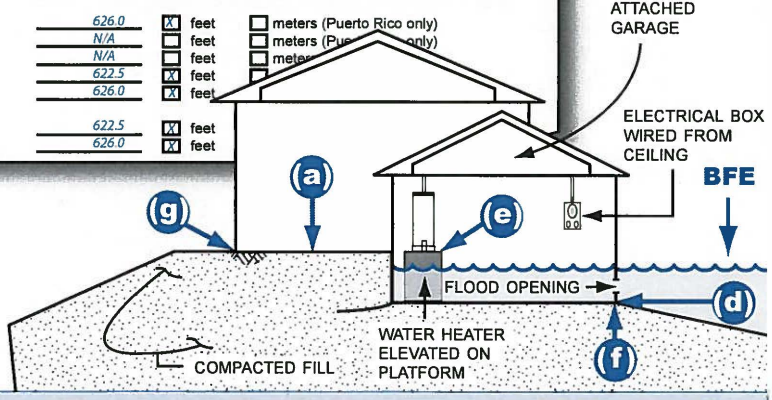
ELEVATION CERTIFICATE (partial)

SECTION C - BUILDING ELEVATION

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 A1-30, 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-g below according to the building diagram specified on Item A7.
Benchmark Utilized N/A Vertical NAVD 88
Conversion/Comments

a)	Top of bottom floor (including basement, crawlspace, or enclosure floor)	626.0	X feet	meters (Puerto Rico only)
b)	Top of the next higher floor	N/A	feet	meters (Pu… only)
c)	Bottom of the lowest horizontal structural member (V Zones only)	N/A	feet	mete…
d)	Attached garage (top of slab)	622.5	X feet	
e)	Lowest elevation of machinery (Describe type of equipment in Comments)	626.0	X feet	
f)	Lowest adjacent (finished) grade (LAG)	622.5	X feet	
g)	Highest adjacent (finished) grade (HAG)	626.0	X feet	



Note: The letters in the picture to the right correspond to the letters listed in Section C of the EC above.

In this example, the BFE is 625 feet.

The slab-on-grade house was elevated on fill 1' above the BFE, and the attached garage is 2.5' below BFE.

You must have a surveyor, architect or Professional Engineer authorized by the Commonwealth of Kentucky to certify elevations, complete the Elevation Certificate and seal it. The Elevation Certificate includes diagrams for eight building types. Several points must be surveyed.

Required Floodway "No Rise/No Impact" Certification

- Floodways can be dangerous because water may flow very fast.
- Development is not allowed unless there is "no rise" in flood elevations, floodway elevations, and floodway widths are certified.
- An engineer must evaluate the hydraulic impact of proposed development.
- A "no rise/no impact" certification is required and must be signed, sealed, and dated by a Professional Engineer licensed in Kentucky.

ENGINEERING "NO IMPACT" CERTIFICATION (excerpts)

This is to certify that I am a duly qualified engineer licensed to practice in the Commonwealth of Kentucky.

It is to further certify that the attached technical data supports the fact that the proposed (Name of Development) will not impact the 100-year flood elevations, floodway elevations and floodway widths on (Name of Stream) at published sections in the Flood Insurance Study (FIS) for (Name of Community) (Dated) and will not impact the 100-year flood elevations, floodway elevations, and floodway widths at unpublished cross-sections in the vicinity of the proposed development.

_____ _____

(Date) (Signature)

- Check with your community for guidance before you decide to work in a floodway.

The engineering analysis must be based on technical data obtained from FEMA. **Reduce flood risk - don't build in the Floodway!**