2023

FLOODPLAIN MANAGEMENT IN NEW YORK STATE

Quick Guide

New York State
Department of Environmental Conservation
Floodplain Management
https://www.dec.ny.gov/lands/24267.html

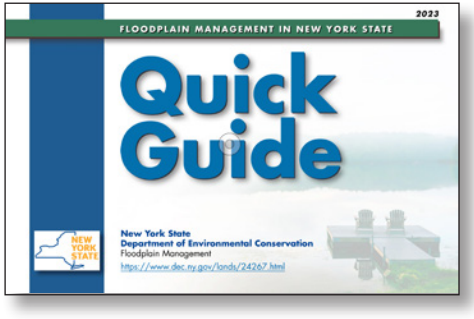
Table of Contents

Table of Contents (continued)

Table of Contents (continued)

About This Guide

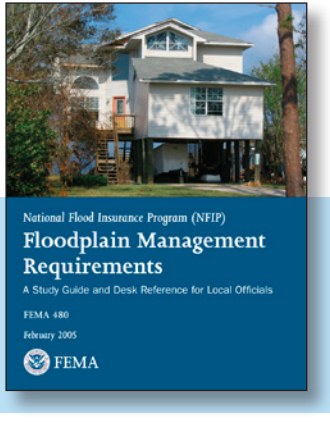
This **Quick Guide** helps local officials and citizens understand why and how New York State communities manage development in floodplains to protect people and property. The New York State Uniform Code includes requirements for buildings in floodplains. Communities adopt ordinances with requirements. In cases of conflict, those codes and ordinances must be followed, not the guidance in this publication.



This **Quick Guide** was developed and funded jointly by the New York State Department of Environmental Conservation (NYSDEC) and the Federal Emergency Management Agency (FEMA). Download the guide from https://www.dec.ny.gov/lands/24267.html.

Questions, comments and requests for additional copies should be directed to the NYSDEC Floodplain Management Program at floodplain@dec.ny.gov

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 National Flood Insurance Program (NFIP) flood insurance is available. Communities must join the NFIP and administer floodplain management requirements before residents and businesses can purchase NFIP flood insurance and be eligible for some types of Federal assistance, including flood mitigation grants.

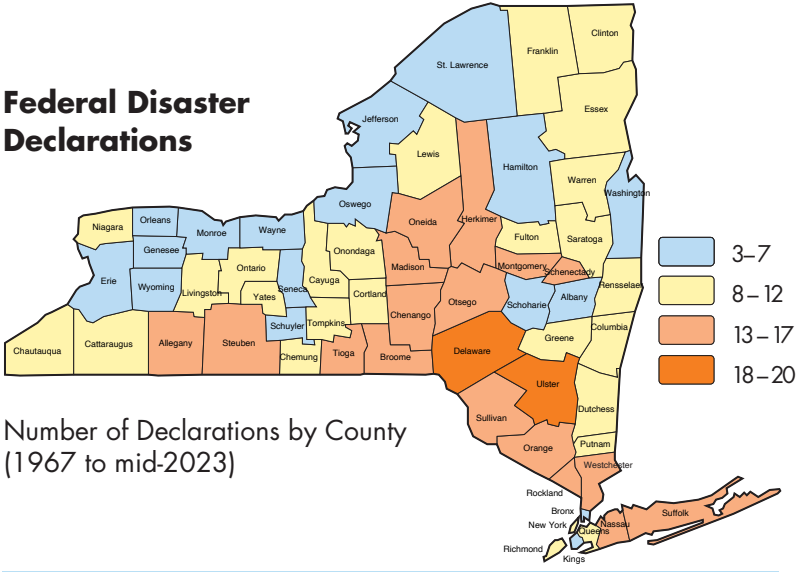
To save tax dollars. Every time communities experience flood disasters local budgets are impacted. If we build smart, we'll have fewer problems the next time the water rises. Remember, Federal disaster assistance is not available for all floods. Even when the President declares a disaster, communities 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, NFIP flood insurance policy holders in New York State have received over $5.6 billion in claim payments. Even though that represents many payments, most of the State's flood-prone property owners do not have flood insurance.

New York State Federal Disaster Declarations

Federal Disaster Declarations



Number of Declarations by County
(1967 to mid-2023)

Most flood events are not declared major disasters. Many floods are local, affecting only small areas such as several homes, a limited number of communities, or a few watersheds.

- More than 70% of New York State's declared disasters involved flooding. Winter storms, winds, and tornadoes account for the rest.
- Most counties, cities, towns, and villages in New York State have identified floodprone areas shown on Flood Insurance Rate Maps.
- Thousands of buildings and other structures are located in identified floodprone areas, called Special Flood Hazard Areas (SFHAs).
- Flood maps have not been prepared for many waterways.
- Seven municipalities are floodprone but elect to not participate in the National Flood Insurance Program and do not enforce floodplain management regulations (as of July 2023).

What is the National Flood Insurance Program (NFIP)?

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 22,300 communities participate in the NFIP. In New York State, more than 1,500 counties, cities, towns and villages 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 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 NFIP 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 NFIP flood insurance, including your potential flood risk and the approximate cost of a flood insurance policy, go to the FEMA FloodSmart website www.floodsmart.gov.

Local, State, and Federal Roles and Responsibilities

Communities (city, county, town, village):

- ❑ Adopt floodplain management ordinances
- ❑ Enroll in the National Flood Insurance Program (NFIP)
- ❑ Administer and enforce building codes and ordinances, maintain records

NYS Department of Environmental Conservation:

- ❑ Oversight of community floodplain management programs and approval of ordinances
- ❑ Technical assistance and training
- ❑ Assist with flood study data and mapping
- ❑ Coordinate between FEMA and communities

FEMA:

- ❑ Oversees the NFIP (enrolls communities, can suspend or put communities on probation)
- ❑ Produces flood studies and flood maps
- ❑ Reviews and approves changes to flood maps

Community Responsibilities

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

- **Recognize** flood hazards in community planning (see page 8)
- **Adopt and enforce** flood maps and a flood damage prevention ordinance
- **Require** permits for all types of development in the floodplain (see page 41)
- **Assure** that building sites are reasonably safe from flooding
- **Require** new and substantially improved buildings, manufactured homes, and additions to be elevated to or above the Base Flood Elevation (BFE) plus 2 feet
- **Require** non-residential buildings to be elevated or dry floodproofed to or above the BFE plus 2 feet
- **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 55, 56, and 57)
- **Carefully consider** requests for variances
- **Resolve** non-compliance and violations of floodplain management requirements
- **Advise and work** with FEMA and NYSDEC when updates to flood maps are needed
- **Maintain** records for review and respond to periodic requests from FEMA and NYSDEC

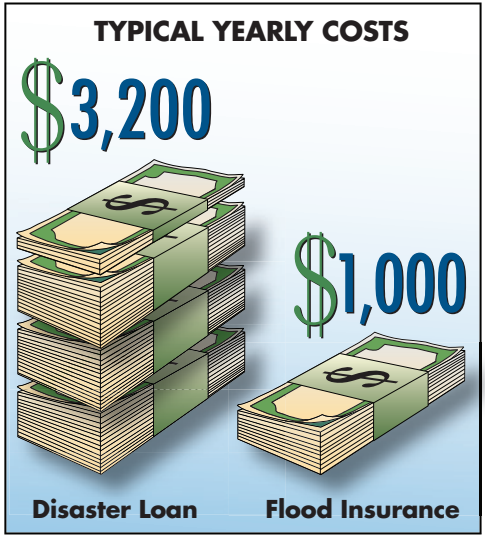
Flood Insurance: Property Owner's Financial Protection

Who needs flood insurance? Flood insurance is required for all buildings in mapped flood zones shown on FEMA's maps if the properties are financed by Federally-backed loans or mortgages.

Who can purchase flood insurance? Homeowners, business owners, and renters in communities that participate in the NFIP may purchase NFIP flood insurance on any building and its contents, even buildings outside of mapped flood zones.

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 35% of all flood damage occurs in low risk zones, commonly described as being "outside the mapped floodplain."

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 occur.



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.

COMMUNITY PLANNING, RESILIENCE, AND ADAPTATION STRATEGIES

NFIP Recommended Planning Considerations

New York State communities should consider incorporating planning considerations into comprehensive plans, land development codes, floodplain management regulations, and multi-hazard mitigation plans to reflect the long-term goal of increasing resiliency to future flooding. NFIP regulations (44 CFR 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 minimum BFE plus 2 feet required by the New York State Uniform Code (requires NYS Code Council approval)
- **Require consistency** between State, regional and local comprehensive plans and floodplain management programs
- **Require** evacuation plans for manufactured home parks and subdivisions

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
- **Undertake** engineering studies and prepare flood maps
- **Maintain** drainage systems
- **Monitor** flood conditions and issue warnings
- **Develop** hazard mitigation plans and watershed and storm management plans
- **Obtain** grants to buy out or elevate houses, or to floodproof manufacturing/industrial structures
- **Inform** people about flood hazards, flood insurance, and how to reduce flood damage

Important Information

Community officials can request assistance from CRS specialists to help with the application process and prerequisites. Check the online CRS Resource Center (see page 101).

Property owners in 36 New York State communities that participate in the CRS receive premium discounts ranging from 5% to 25% (as of June 2023).

Flood Risk Management: Resilience and Climate Change

In 2014, the New York legislature passed the **Community Risk and Resiliency Act (CRRA)** to increase resilience of the State and communities to future flooding and anticipated sea level rise. CRRA directed NYSDEC to include requirements for activities subject to NYSDEC permits to demonstrate consideration of sea-level rise, storm surge, and flooding, including projects for coastal erosion, streambank stabilization, and those that impact wetlands. CRRA also requires considerations of those future impacts in certain state-funded projects, including public infrastructure. In 2019, CRRA was expanded by the **Climate Leadership and Community Protection Act (CLCPA)** to include consideration of all climate-related hazards in NYSDEC permitted and funded projects.

The **New York State Flood Risk Management Guidance** outlines three methods to estimate projected future flood elevations and areas subject to those future risks:

- Download the guidance for state agencies on consideration of flooding risk based on project and environment types: https://www.dec.ny.gov/docs/administration_pdf/crrafloodriskmgmtgdnc.pdf
- Download companion guidance for estimating elevations using the three methods: https://www.dec.ny.gov/docs/administration_pdf/crraestelevguidelines.pdf

Three methods to estimate projected future flood elevations and areas subject to those future risks:

- Horizontal extension of BFE + 2 or 3 feet
- Identifying 10% or 20% design flow criteria based on project type.
- Using climate informed science to adjust projects based on sea-level rise projections.

Climate Change and Sea Level Rise Adaptation Strategies

Community planners and property owners should understand the impacts of climate change and sea level rise on future flooding:

- **Coastal Floodplains:** New York State updates sea level rise projections every 5 years. NYS sea level rise projections are online: https://www.dec.ny.gov/energy/102559.html.
- **Inland Floodplains:** Storms are increasing in frequency and the amount of heavy rainfall produced, which can result in more frequent and higher flooding than shown on FIRMs.

Some adaptation strategies include:

- Modify density in areas expected to experience the most significant increased flooding.
- With NYS Code Council approval, require more freeboard for new building than specified in the NYS Uniform Code.
- Apply floodplain management requirements in areas subject to projected sea-level rise flooding.
- Expand outreach and public education to advise citizens about future flood risks.

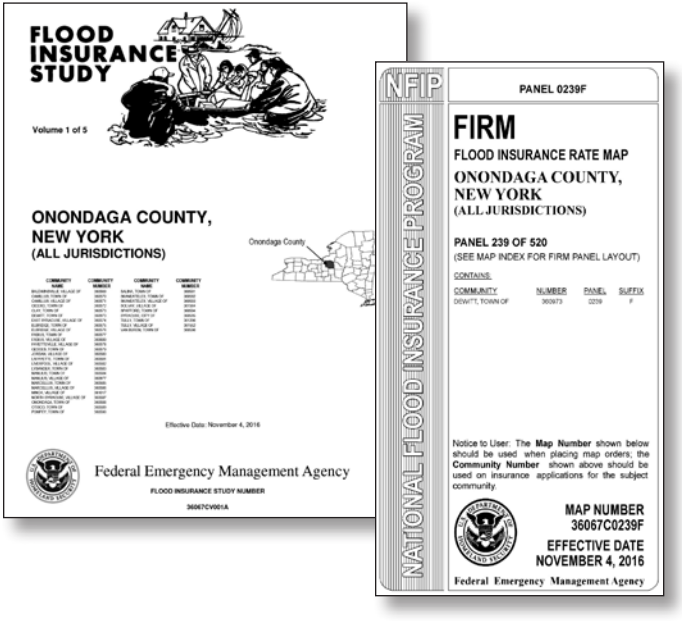
Important Information

FEMA **does not** include climate change and sea level rise impacts when preparing Flood Insurance Studies and FIRMs.

Learn more about how projected climate change will impact communities and residents by reviewing the NYSDEC *Observed and Projected Climate Change in New York State: An Overview*: https://www.dec.ny.gov/docs/administration_pdf/ccnys2021.pdf

FLOODPLAINS AND FLOOD MAPS

Looking for FEMA Flood Map Information?



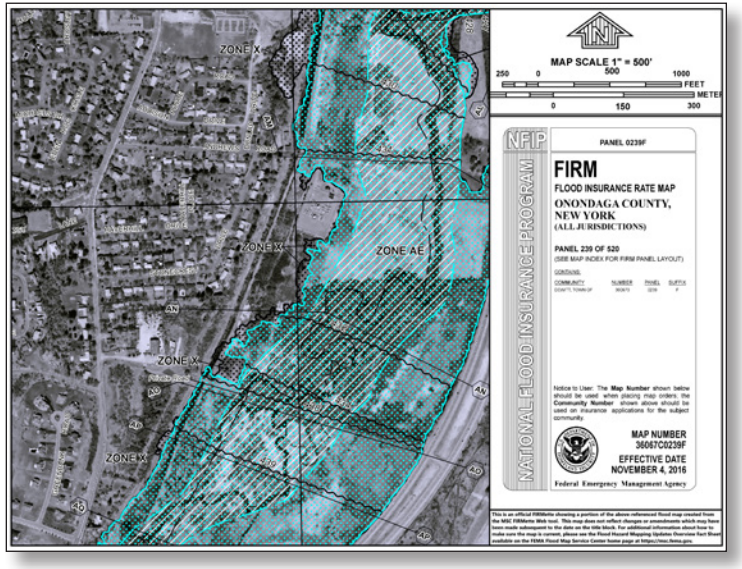
- Flood Insurance Studies (FISs) are compilations of flood risk information used for community planning and development.
- Flood Insurance Rate Maps (FIRMs) show flood zones subject to regulations and where flood insurance is required.
- Access FIRMs at the FEMA Flood Map Service Center at https://msc.fema.gov, 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, zoning, engineering, or permit offices may also have paper flood maps available for viewing by the public.

FIRMette: FEMA Flood Maps Online

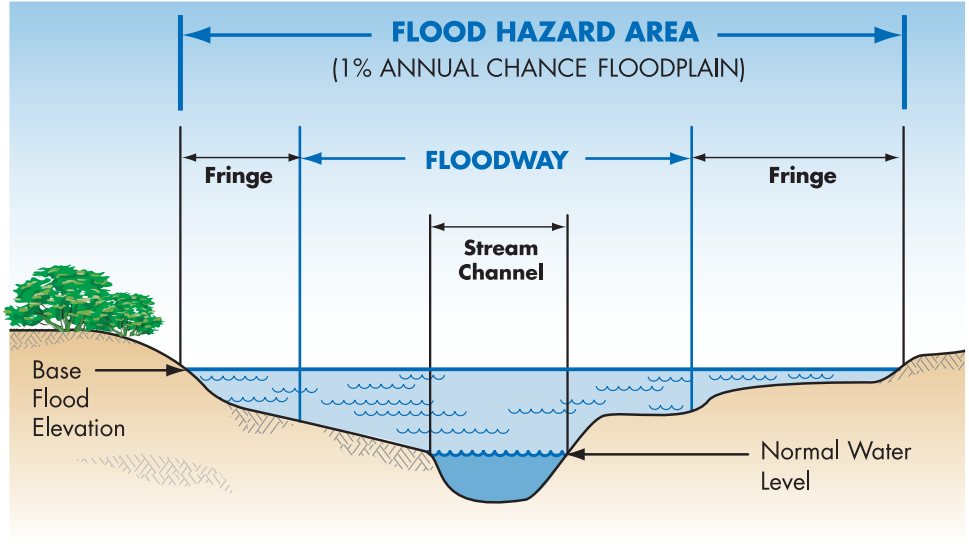
Portions of flood maps can be produced, saved, and printed by making a "FIRMette." FIRMettes are full-scale sections of FIRMs.

- For instructions, search online for "How to Print a FIRMette and Download a FIRM Panel."
- 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 https://msc.fema.gov and check out the "MSC Frequently Asked Questions." For step-by-step instructions on how to read flood maps and 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 16).

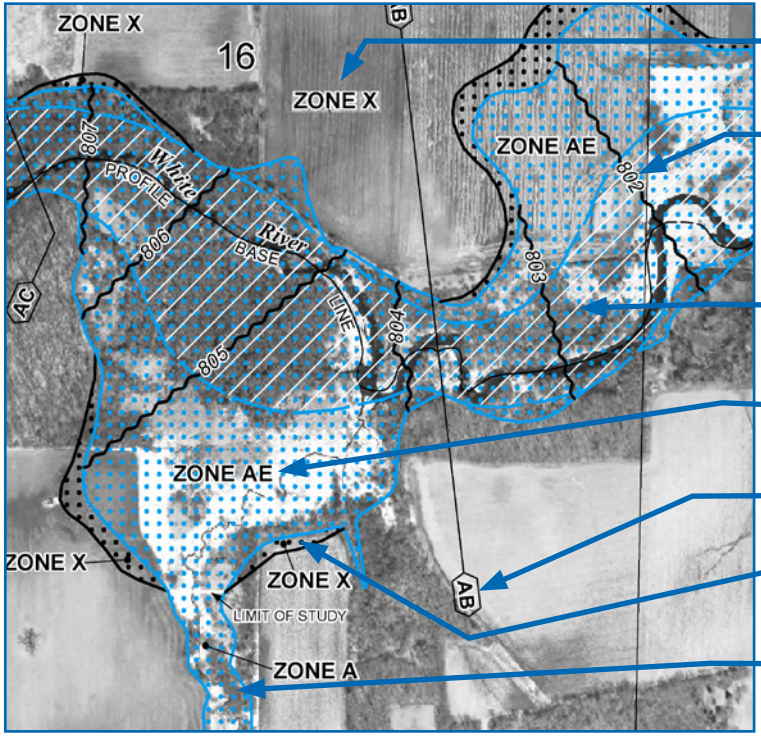
Terms and Definitions

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

See page 17 to learn about the floodway, the area of the SFHA where flood waters usually are deeper and flow faster.

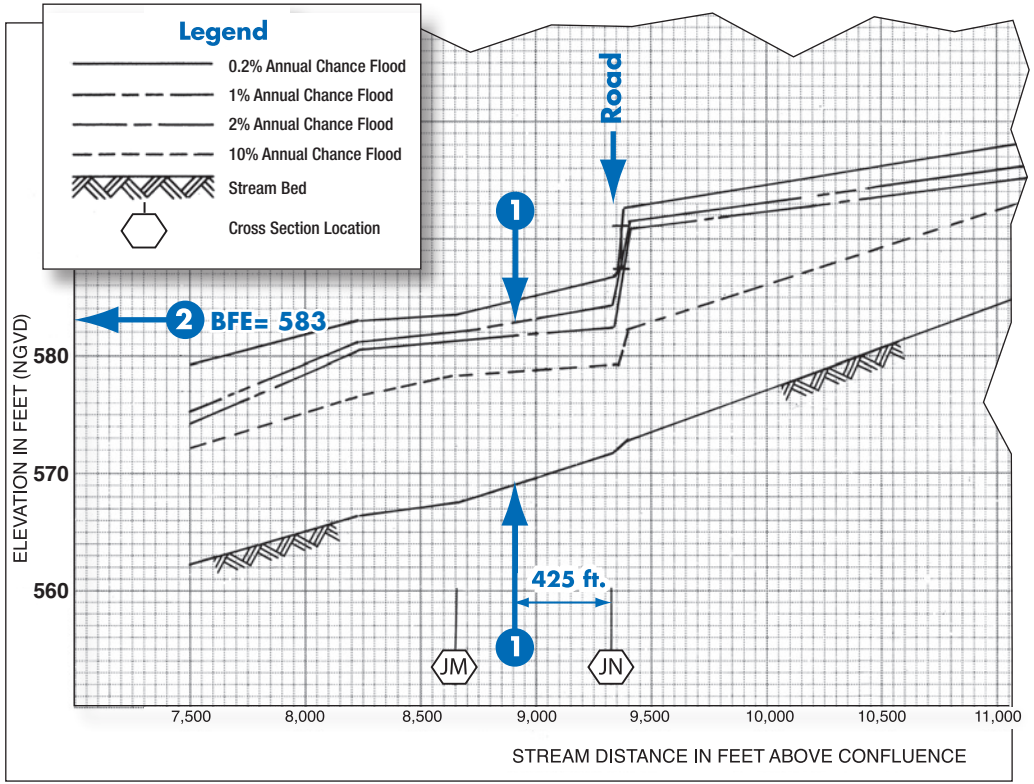
See page 26 to learn about coastal floodplains along the Atlantic Coast, Long Island Sound, the Lower Hudson River, and the Great Lakes.

Flood Insurance Rate Map (Riverine)



1. **Unshaded Zone X** is all other areas considered low risk.
2. **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 regulatory elevations).
3. The **Floodway** is the cross-hatched area (see page 17).
4. **Zone AE** is the 1% annual chance (100-year) floodplain with BFEs.
5. **Cross Section** location (see page 16).
6. **Shaded Zone X** is the 0.2% annual chance (500-year) floodplain.
7. **Zone A** (approximate) is the 1% annual chance floodplain.

Using the Riverine Flood Profile to Determine Riverine BFEs

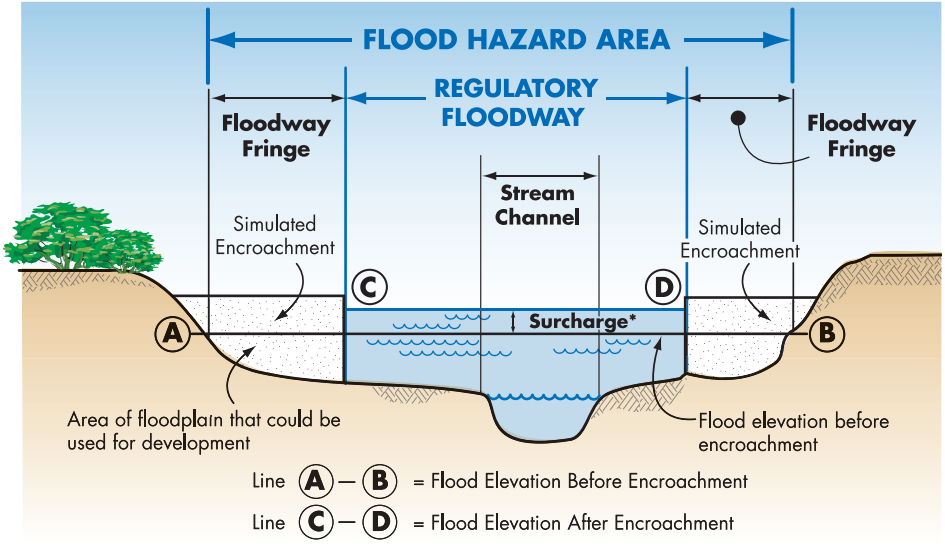


Flood Profiles from Flood Insurance Study reports can be used to determine the BFE at a specific site. Profiles also show estimated water surface elevations for floods other than the 1% annual chance flood (100-year).

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: 583.0 feet).

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 34). 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.

Floodway Data Table

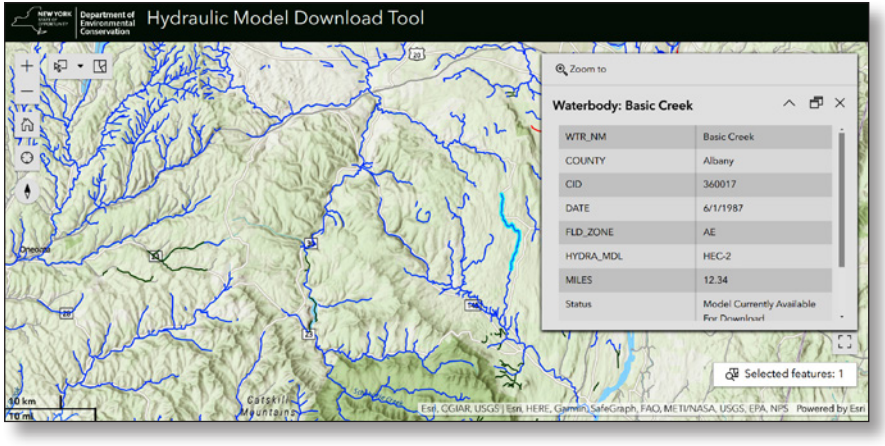
Flood Insurance Studies have Floodway Data Tables for every waterway that was studied by detailed methods for which floodways were delineated.

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1] (FEET)	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Skaneateles Creek (Cont.)								
AE	26,956	36	229	9.3	478.9	478.9	479.1	0.2
AF	27,502	59	295	7.2	484.6	484.6	484.8	0.2
AG	27,927	49	220	9.7	488.8	488.8	489.0	0.2
AH	28,340	98	496	4.3	493.5	493.5	494.2	0.7
AI	28,811	52	277	7.7	496.3	496.3	496.5	0.2
AJ	29,137	51	258	8.3	499.1	499.1	499.2	0.1
AK	29,663	85	442	4.8	502.2	502.2	502.3	0.1
AL	30,223	80	368	5.8	503.7	503.7	503.9	0.2
AM	30,778	50	328	6.5 (1)	505.3 (2)	505.3 (3)	505.8	0.5 (4)

[1]Feet above confluence with Seneca River

1. Velocity estimates based on the mean velocity for the cross sections.
2. Computed BFE (rounded values are shown on FIRMs).
3. Elevations may not consider backwater effect from downstream source.
4. Amount of increase between without and with floodway is not more than 1 foot at any location.

NYS Hydraulic Model Download Site



Access the NYS Hydraulic Model Download Site online at https://experience.arcgis.com/experience/4be98d0d7947462788bb08af91da982b/.

NYSDEC may have models that are not yet available on this site. Contact floodplain@dec.ny.gov for more information.

- Engineers, local officials and others sometimes need to use hydraulic models to evaluate proposed projects or determine flood elevations in Approximate Zone A. Hydraulic models prepared by FEMA for many streams are available online.
- Use the **NYS Hydraulic Model Download Site** to select stream segments and view and download hydraulic model information. Some stream segments may have multiple models, including the original models used to produce FIRMs, updated models, and models developed for Letters of Map Revision.

The Floodway "No-Rise" Certification

- Floodways convey a large volume of water and may have high velocities.
- Engineers must prepare floodway encroachment analyses to evaluate the hydraulic impact of proposed development, including but not limited to grading/filling, new/replacement culverts and bridges, and bank stabilization.
- Development is allowed if certified to cause "no-rise" (0.00 ft. increase) in BFEs or if legal arrangements are made.
- Fencing in floodways should be "open" to allow floodwater to flow through; solid and chain link fencing are floodway encroachments.
- "No-rise" certifications must be signed by Professional Engineers licensed in New York State and qualified to conduct hydraulic analyses.
- Guidance for hydraulic modeling of floodway impacts and no-rise certification is available at https://www.dec.ny.gov/lands/24281.html.

ENGINEERING "NO-RISE" CERTIFICATION

Community: Anytown, NY
Applicant: ABC Developers, Inc.
Address: 210 River Road

This is to certify that I am a duly qualified professional engineer licensed to practice in the State of New York. It is further to certify that the attached technical data supports the fact that the described project will not impact the floodway width or 1% elevation (will not raise or lower by more than 0.00 ft.) of said flooding source in the Flood Insurance Study for the above community dated [date of FIS] and will not impact the 1% elevation at unpublished cross-sections in the vicinity of the proposed development.

P.E.

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

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

Shallow Flooding: Zone AO and Zone AH

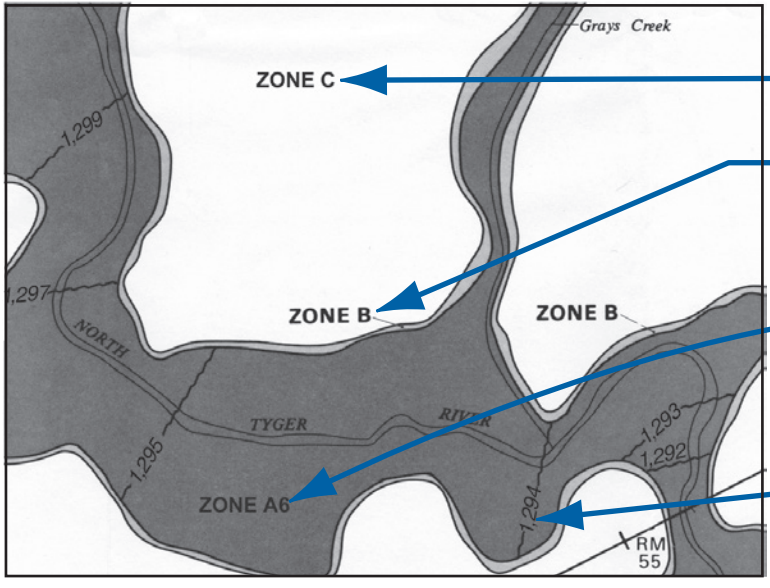
Zone AO and Zone AH are SFHAs delineated on some FIRMs. FEMA uses these zone designations where there are no clearly defined channels and the flooding is characterized by ponding and sheet flow. In coastal areas, Zone AO usually marks areas at risk of flooding from wave overtopping, where waves are expected to wash over the crest of a dune or bluff and flow down the landward side of the features.

In Zone AO and Zone AH, the base flood (1% annual chance) is expected to have average depths of 1 to 3 feet. In these SFHAs, communities must require permit applicants to provide adequate drainage paths around structures on slopes to guide floodwaters around and away from proposed structures. For buildings and manufactured homes, in these zones the elevation of lowest floors (or dry floodproofing, if permitted) is determined as follows:

- Some Zone AO areas have specified depth numbers, which indicates the expected depth of water relative to the highest adjacent grade during base flooding. The depth number is equivalent to a flood elevation and lowest floors (or dry floodproofing, if allowed) must be at or above the depth number plus 1 foot, as required by the NYS Uniform Code.
- Some Zone AO areas do not have specified depth numbers. In those areas, the Uniform Code requires lowest floors (or dry floodproofing, if allowed) to be at least 3 feet above the highest adjacent grade.
- Zone AH areas have BFEs specified on FIRMs, which is used in the Uniform Code to determine floor and dry floodproofing elevations (BFE plus 2 feet).

Because Zone AO have flood depth numbers instead of BFEs, the Letter of Map Amendment process may be different than the process for other SFHAs. Contact the NYSDEC Floodplain Management Program staff at floodplain@dec.ny.gov for assistance with the LOMA process.

Old Format Flood Insurance Rate Map



FLOOD HAZARD ZONES

1. **Zone C** (or Zone X) is all areas considered to be low risk.
2. **Zone B** (or shaded Zone X) is subject to flooding by the 500-year flood (0.2% annual chance), and other moderate risk areas.
3. **Zone A, Zones A1-A30** or **Zone AE** are subject to flooding by the base or 100-year flood (1%-annual-chance), and are considered high risk areas.
4. **Base flood elevation (BFE).** Water surface elevation of the base flood at specific locations.

FEMA prepares Flood Insurance Rate Maps (FIRMs) to show areas that are at high risk of flooding. These "old format" FIRMs, and companion Flood Boundary and Floodway Maps (see page 23), are being revised and digitized as part of FEMA's nationwide map modernization initiative.

Old Format Flood Boundary and Floodway Map

1. **The Floodway** is the white unshaded around the waterway centerline.
2. **Cross Section** location, where ground surveys determined the shape of the land and how constrictions such as bridges and culverts affect the flow of floodwater.

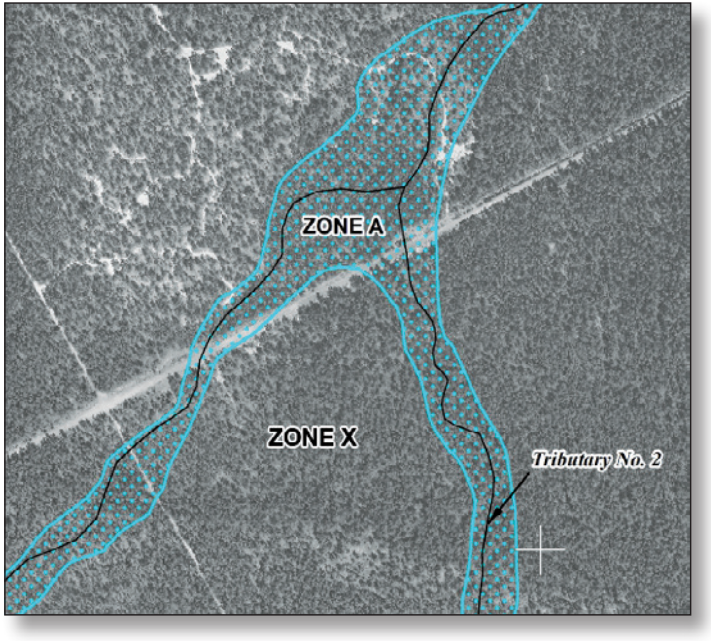
Important

Information

Floodway maps do not show flood zones or BFEs. Check the companion FIRM for that information. Page 22 shows the FIRM that matches the map clip to the left.

FEMA prepared floodway maps as companions to many "old format" FIRMs. If FIRMs are dated 1988 or earlier, check for a companion floodway map to see if your project will be in the floodway because additional engineering may be required (see page 20).

Approximate Flood Zones



Approximate Zone A designations are based on minimum criteria established by FEMA, using very little field work and limited data. Newer FIRMs have better elevation data based on high resolution topography (LiDAR) which results in more accurate boundaries.

When development is proposed in Approximate Zone A, BFEs must be determined before permit applications are reviewed. BFE estimates may be available from NYSDEC.

For more information contact NYSDEC Floodplain Management at floodplain@dec.ny.gov

Terms and Definitions

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

Sometimes the Approximate Zone A is called an "unnumbered A zone."

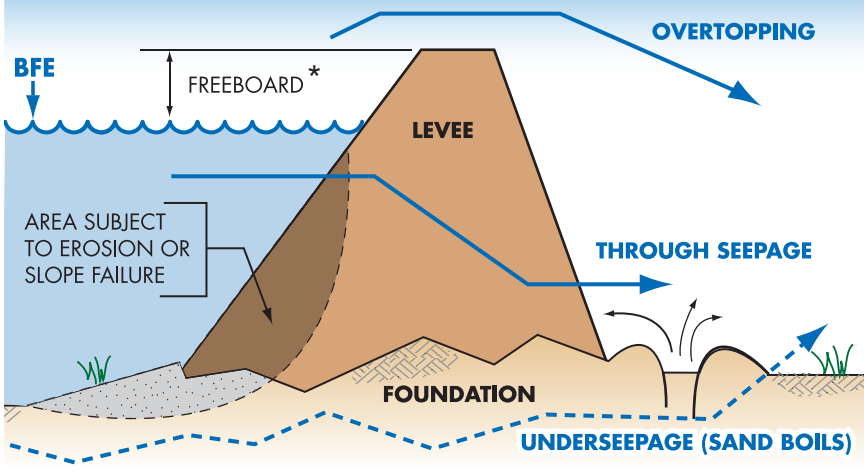
Everyone lives in an area with some flood risk – it's just a question of whether it is a low, moderate, or high-risk flood hazard area.

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.

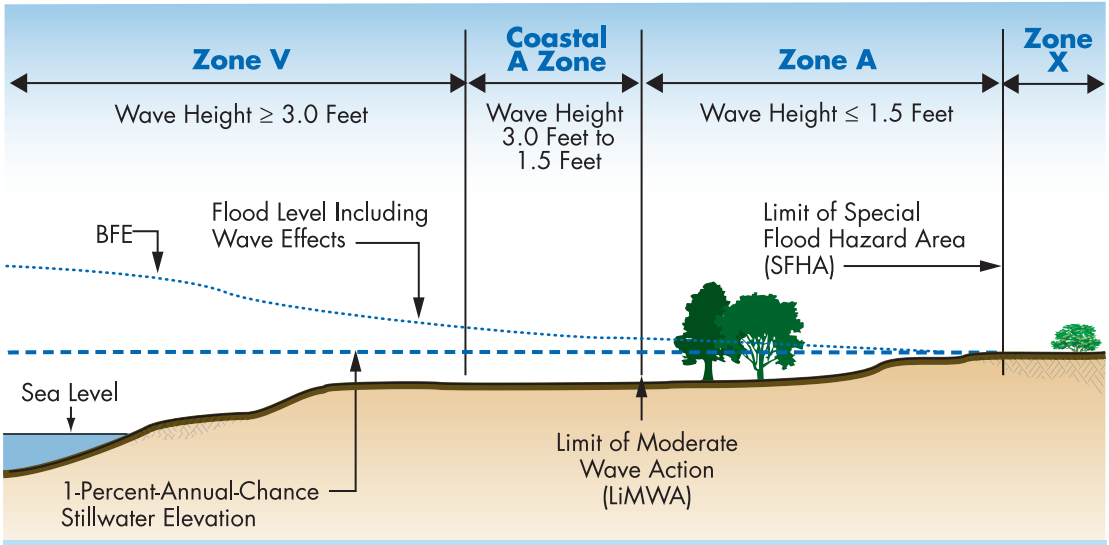
Communities that have levees should determine as soon as possible whether certification will be required. Pursuant to FEMA's Procedural Memoranda 34 and 43, and as outlined in Federal regulations at 44 CFR Section 65.10, the documentation requirements address:

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



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

Understanding the Coastal Floodplain



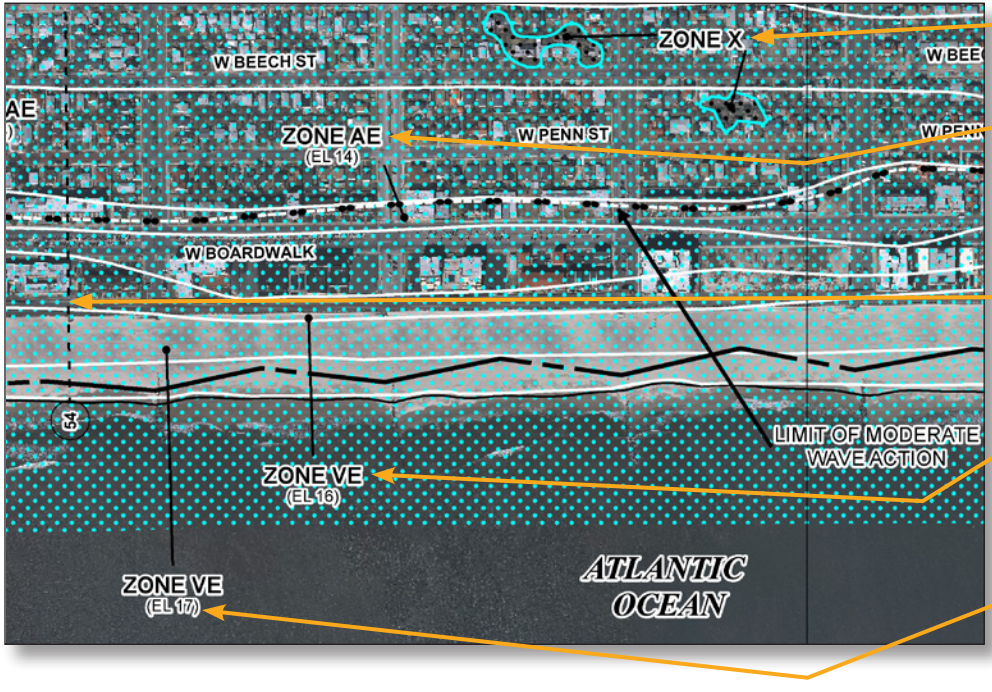
Areas subject to Coastal A Zone conditions (wave heights between 3 feet and 1.5 feet) may not be shown on FIRMs. The New York State Uniform Code treats the CAZ area as Zone V and requires development to comply with the Zone V requirements, except backfilled stem walls are allowed.

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.

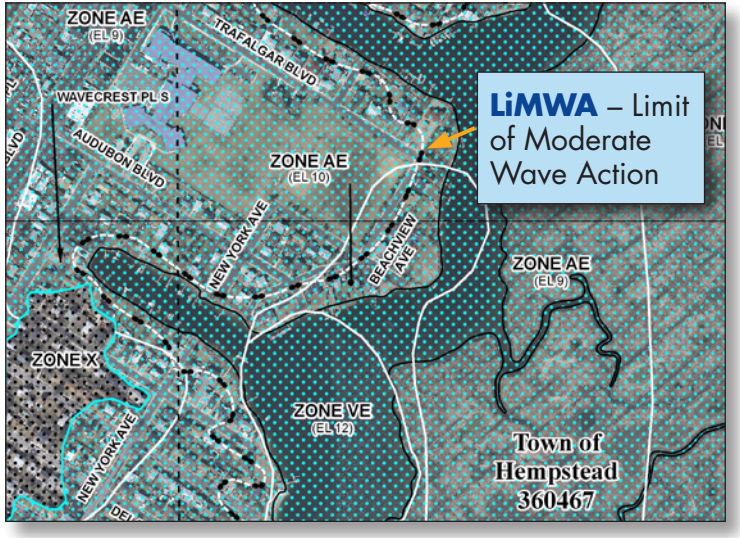
The term **Coastal A Zone (CAZ)** refers to a portion of the SFHA landward of a Zone V or landward of an open coast without Zone V. CAZs may be subject to breaking waves between 3 and 1.5 feet high.

Flood Insurance Rate Map (Coastal)



1. **Zone X** (black stipple) is the 0.2% annual chance (500-year) floodplain.
2. **Zone AE** is subject to flooding by the base or 1% annual chance (100-year) flood, wave heights less than 3 feet.
3. **Coastal Transect** is a cross section representing a segment of coast with similar characteristics (see page 30).
4. **Zone VE** is the 1% annual chance (100-year) floodplain where wave heights are expected to be 3 feet or more.
5. **Base flood elevation (BFE)** is the water surface elevation (in feet above the vertical datum).

The Coastal A Zone (CAZ)



Legend

Limit of Moderate Wave Action

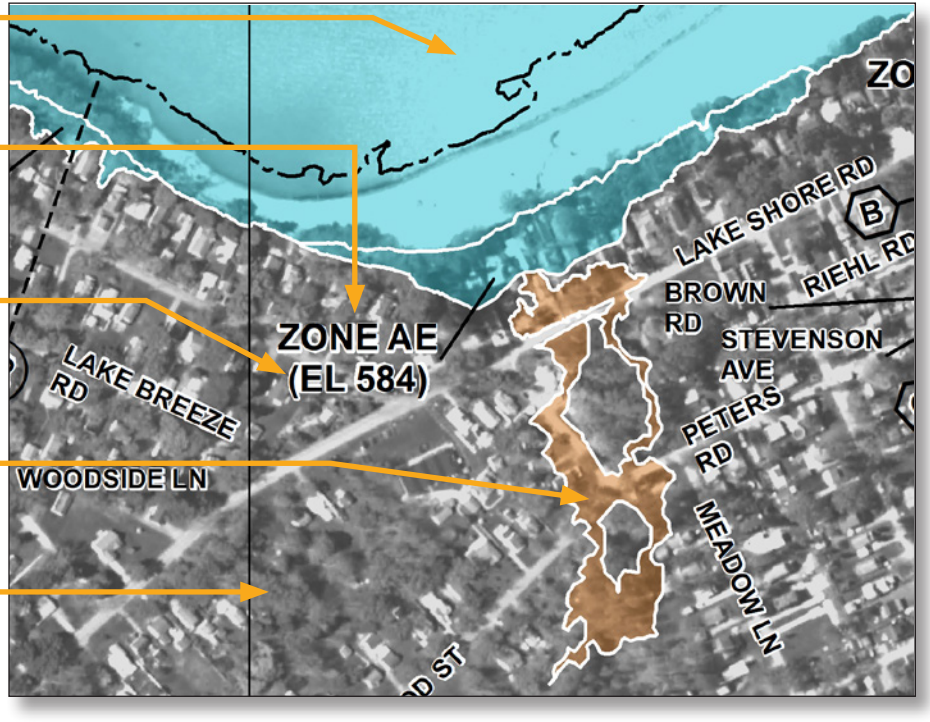
Notes to Users
AE Zone has been divided by a Limit of Moderate Wave Action (LiMWA). The LiMWA represents the approximate landward limit of the 1.5-foot breaking wave. The effects of wave hazards between the VE Zone and the LiMWA (or between the shoreline and the LiMWA for areas where VE Zones are not 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 a LiMWA is delineated or a community designates a CAZ, the NYS Uniform Code requires buildings to comply with Zone V construction requirements, except backfilled stemwall foundations are allowed.

Flood Insurance Rate Map (Great Lakes)

1. **Zone VE** is where wave heights are expected to be 3 feet or more.
2. **Zone AE** is subject to flooding by the base or 1% annual chance (100-year) flood, and waves less than 3 feet high.x
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.
5. **Unshaded Zone X** is the area of minimal flood risk outside the 0.2% annual chance (500-year) floodplain.



Using Coastal Transects to Determine Coastal BFEs

FIRMs along shorelines of the Great Lakes, New York City, Long Island, and the Long Island Sound show transects and FISs include Coastal Transect Parameter tables. A coastal transect is a cross section taken perpendicular to the shoreline, representing a segment of coast with similar characteristics and representative topographic information. FIRMs and FIS tables must be used to determine accurate BFEs.

BFEs on FIRMs are rounded to the nearest whole foot and may be lower than or higher than the computed BFEs shown in the tables. The BFEs in FIS tables are computed to the nearest tenth of a foot. Use the coastal transect to determine the BFE at a site by:

- Locating the site on the FIRM and identifying the flood zone and BFE.
- Determining the number of the coastal transect that is closest to the site, and looking in the FIS Coastal Transect Parameters table for that transect number.
- For Zone AE, use the Stillwater Elevation in the "1% Annual Chance" column, or the BFE on the FIRM, whichever is higher.
- For Zone VE, always use the BFE on the FIRM.

For assistance with using coastal transects to determine BFEs, contact the NYSDEC at floodplain@dec.ny.gov.

An introduction to FEMA coastal floodplain mapping, with tutorials, is online at https://arcg.is/18mC1m0.

FLOODPLAIN DATA AND RESOURCES

Sources for BFEs in Approximate Zone A Without BFEs

When FIRMs show Zone A without BFEs (called Approximate Zone A), local officials and others must look for floodplain information from other sources to determine BFEs. Potential sources include:

- Data from federal, state, or other sources
- FEMA detailed studies for preliminary or pending maps
- Studies prepared by communities and watershed districts
- Base Level Engineering studies (see page 32)

Sample showing estimated BFE from FEMA Region 2 Base Level Engineering data.

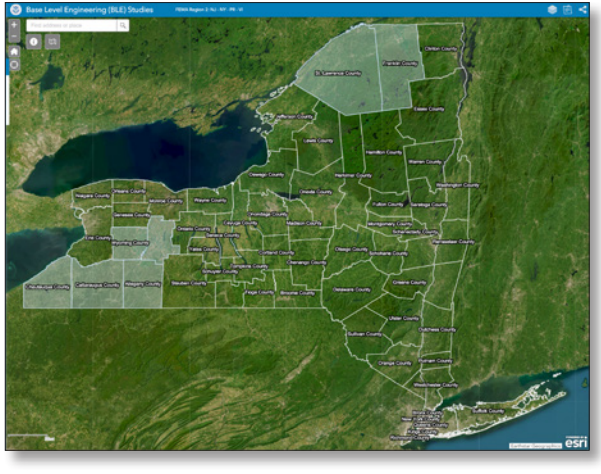
BFEs are needed to apply the NYS Uniform Code requirements in Zone A without BFEs. NYSDEC may have additional data for use by community officials, property owners, and developers.
Contact NYSDEC at floodplain@dec.ny.gov for assistance.

What is Base Level Engineering (BLE)?

Base Level Engineering is an automated riverine hydrological and hydraulic modeling approach that uses high resolution ground data. It produces credible engineering analyses and updated flood hazard information for Zone A areas on FIRMs not supported by existing flood models. NYSDEC is working with FEMA Region II to develop BLE data for communities throughout the State.

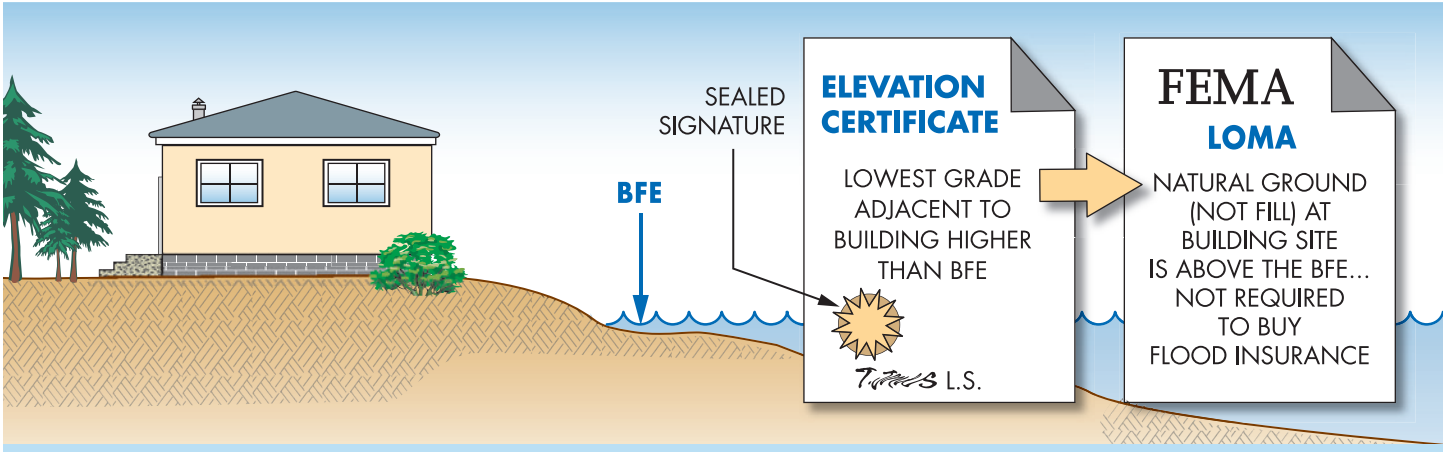
Flood elevations developed with BLE can be used as best available data if they are more restrictive than the SFHA shown on Flood Insurance Rate Maps. BLE data can be used for:

- Floodplain management, planning, and permitting
- Hazard mitigation planning
- Emergency management planning
- Letters of Map Change (LOMC)
- Communicating about flood risks



Access the FEMA Region 2 BLE Viewer at: https://arcg.is/1m4HuP.

Are Building Sites Higher than the BFE?

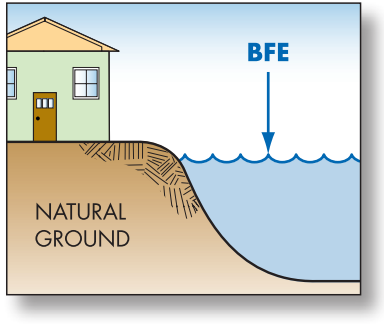


If land is shown on the map as "in" the SFHA, but the building site is on natural ground that is higher than the BFE, owners should get a licenced Land Surveyor to complete a FEMA Elevation Certificate (EC). They can submit a request for a Letter of Map Amendment (LOMA) to FEMA along with the EC to verify that the structure is above the BFE (see page 34). If FEMA approves the request, lenders are not required to have property owners get flood insurance policies, although some may still require policies. FEMA and NYSDEC encourage owners with LOMAs to purchase flood insurance, potentially at reduced rates. Owners should keep ECs and LOMAs with deeds— the documentation will help future buyers.

FIRM Revisions: Letters of Map Revision (LOMA)

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 professional land surveyor, such as elevation of the natural ground (no fill) relative to the BFE.



- FEMA does not charge a fee to process LOMA requests.
- Lenders may waive the flood insurance requirement if the LOMA removes a building site from the SFHA because natural ground at the site is at or above the BFE.

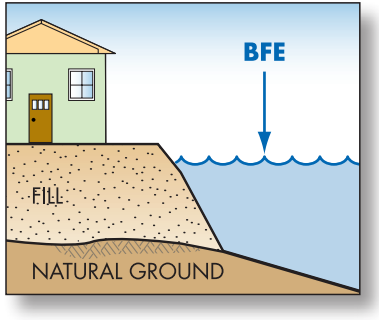
Property owners who place fill to raise sites above the BFE can request Letters of Map Revision based on Fill (LOMR-Fs) described on page 35.

Access to FEMA's web-based application for professional land surveyors to submit eLOMAs is https://hazards.fema.gov/femaportal/resources/whatiseloma.htm.

FIRM Revisions: Letters of Map Revision Based on Fill (LOMR-F)

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 Revision Based on Fill (LOMR-F) is an official FEMA determination that a structure or parcel of land has been elevated by fill above the BFE, and therefore is no longer in the SFHA for federal mandatory flood insurance purposes.



To qualify for a LOMR-F, both the lowest floor (including basement or crawlspace), and the lowest point where fill is next to the building, must be at or above the BFE. Also:

- The application includes a Community Acknowledgement Form for the local official to state if the proposed fill complies with floodplain management regulations.
- The applicant must pay a fee to FEMA.

Property owners whose building sites are in the SFHA but on natural ground that is above the BFE can request Letters of Map Amendment (LOMAs) described on page 34.

Check NFIP Technical Bulletin #10 to learn more about elevating building sites on fill to be reasonably safe from flooding. Guidance on map revisions is available online https://www.fema.gov/flood-maps/change-your-flood-zone/loma-lomr-f.

Options to Document Structures are Not in SFHAs

Sometimes property owners are asked to provide evidence that their buildings and structures are not in SFHAs.

- Most mortgage lenders will accept FIRMettes (see page 13) as evidence that structures are not in SFHAs.
- Lenders may require maps provided by a community, surveyor, or engineer that clearly show structures are not in SFHAs.
- Owners can ask lenders to reconsider determinations. Documentation may be required to clearly show a structure is outside of the SFHA. Lenders may require FEMA LOMAs, especially if it is a close call (see page 34).

From https://www.fema.gov/flood-maps/national-flood-hazard-layer.

LOMAs: "Out as Shown"

- Mortgage lenders that are regulated or insured by the Federal Government are mandated to require flood insurance when any part of a structure is located in the SFHA.
- Lenders sometimes perform automated determinations, where computers compare parcel locations to the SFHA map.
- Owners can ask lenders to reconsider determinations. Documentation may be required to clearly show a structure is outside of the SFHA. Lenders may require FEMA LOMAs, especially if it is a close call.
- Lenders have discretion to require flood insurance even when structures are not in the SFHA (usually occurs when a portion of the lot is in the SFHA).

See page 36 for documentation required for lenders or that is required to seek Letters of Map Amendment from FEMA to show structures are not in SFHAs, sometimes called "out as shown."

Red Circle: A corner of the structure is in the SFHA. Lenders must require flood insurance unless the owner obtains a Letter of Map Amendment from FEMA.

Yellow Circles: Structures clearly not in the SFHA, but parts of the lots may be in. (Flood insurance is not mandatory, but is encouraged.)

More on LOMAs: Using LiDAR Topography

Owners can obtain LOMAs to show buildings are not in SFHAs if topographic mapping developed using LiDAR technology clearly shows an entire structure is on land that is at least 1 foot above the BFE and the site was not filled to make it higher than the BFE. A field survey might not be required.

- Acceptable maps are prepared by community officials, licensed surveyors, or professional engineers.
- Maps must include:
  - ❏ Aerial photo, with building identified
  - ❏ Contour below, but not touching, structure identified
  - ❏ BFE elevation
  - ❏ Address (or legal description) and parcel boundary
  - ❏ Scale and north arrow

Access LIDAR datasets:

- In-progress LIDAR: https://data.gis.ny.gov/maps/nys-in-progress-lidar-collections/
- Latest LIDAR: https://data.gis.ny.gov/maps/nys-latest-lidar-collections/
- Historic LIDAR: https://data.gis.ny.gov/maps/nys-historic-lidar-collections/

This example based on county GIS shows the building is entirely above the contour shown in blue, which is more than 1 foot above the BFE.

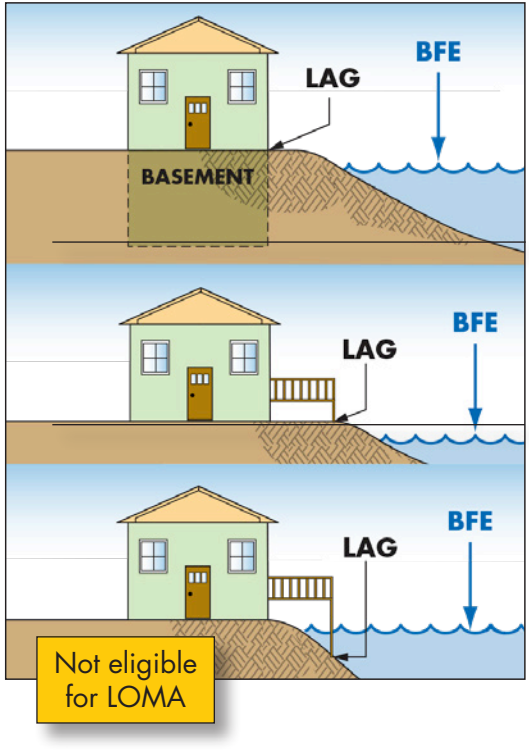
More on LOMAs: Basements and Decks

Owners can obtain LOMAs to show buildings are not in SFHAs even when buildings have basements, provided:

- Earthen fill has not been placed since date of the first FEMA map showing the site in the SFHA.
- The Lowest Adjacent Grade (LAG) is at or above the BFE.

Owners can obtain LOMAs to show buildings are not in SFHAs when buildings have decks or stairs, provided:

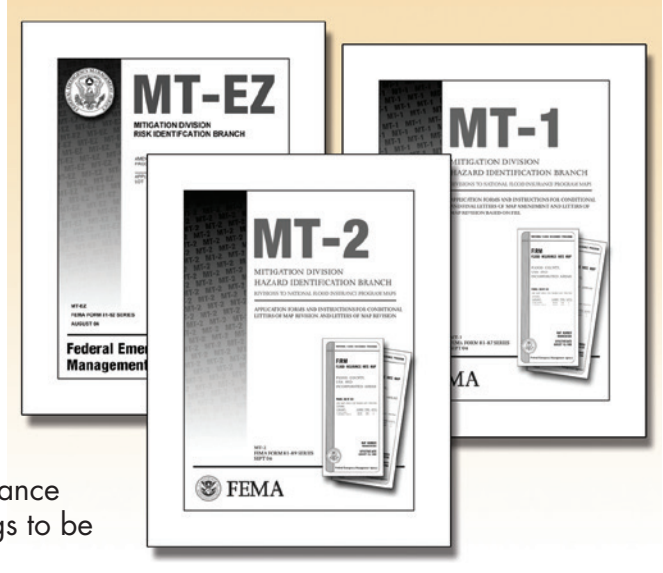
- The Lowest Adjacent Grade (LAG) at the lowest deck or stair support is at or above the BFE.
- Documentation that the deck or stairs are detached (not structurally connected), as long as the LAG next to the building is at or above the BFE.



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 CLOMRs before issuing permits for projects that propose to increase BFEs or change SFHA or floodway boundaries. 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.



LOMRs are required when fill and grading alter BFEs or change SFHA or floodway boundaries. To learn more and download FEMA forms, find links by searching key words "MT-EZ," "MT-1," and "MT-2."

REGULATED DEVELOPMENT AND PLANNING CONSIDERATIONS

Development in SFHAs Requires Local Permits and Approvals

- Construction of new buildings
- Additions to buildings
- Improvements to buildings
- Renovation of building interiors
- Repair of damaged buildings
- Placement of manufactured homes
- Subdivision of land
- Construction or placement of accessory structures and temporary buildings
- Construction of agricultural buildings
- Construction of roads, bridges, and culverts
- Placement of fill, grading, excavation, mining, and dredging
- Alteration or relocation of stream channels
- Wind and solar farms

Terms and Definitions

Development is any man-made change to improved or unimproved real estate, including but not limited to, buildings or other structures, tanks, temporary structures, temporary or permanent storage of equipment or materials, mining, dredging, filling, grading, paving, excavations, drilling operations or any other land disturbing activities.

Floodplain development or building permits must be obtained before these activities and **ANY** land-disturbing activities occur in flood zones. Contact community permitting offices for specific requirements.

Open Space Uses Allowed Without Permits

Many open spaces uses are allowed without a permit, provided the uses are not prohibited by any other regulation or statue, **do not require (or include) structures, and do not require fill, grading, excavation or storage of materials or equipment:**

- Agricultural uses such as tilling, irrigation, ranching, harvesting, grazing, etc.
- Accessory uses such as loading and parking areas and emergency landing strips
- Forestry practices
- Recreational vehicles on site for less than 180 days, fully licensed and road ready
- Residential uses such as lawns, gardens, parking areas, and play areas
- Maintenance of existing open space uses
- Public or private recreational uses such as picnic grounds, swimming areas, parks, campgrounds
- Fences that have a low impact on the flow of water
- Highway guard rails and signs

Who Must Get Floodplain Development Permits?

Communities adopt local floodplain management ordinances. They are responsible for issuing floodplain development permits for any development proposed in SFHAs, and for issuing building permits for buildings in SFHAs.

Any person or entity that proposes development in SFHAs must get permits, including:

- Property owners
- Private developers
- Counties
- Cities, towns, and villages
- School districts
- Public improvement districts

NYS Environmental Conservation Law Article 36 specifies that local floodplain requirements apply to school districts that construct or improve projects in SFHAs. The New York State Education Department specifies that school districts are subject to the requirements of the local floodplain administrator when planning and designing projects in floodplains.

Localized Flooding Risks

Property owners should look at where rainfall runoff will flow.
Many factors contribute to localized flooding risks:

- Debris and trash that blocks drainage channels and builds up at culverts and bridges
- Overgrown ditches and swales
- Upstream development redirected storm drainage
- Local depressions and low points on roadways where water collects
- Solid walls around property lines or buildings that divert flow
- Undersized culverts
- "King Tides" contribute to local flood when high tides flood low lying areas or back up into storm drainage systems, preventing rainfall runoff from draining to the ocean.

Important Information

Flood Insurance Rate Maps do not show most areas that experience localized flooding.

One-third of NFIP insurance claims are paid on losses in low and moderate risk zones outside of mapped SFHAs.

Avoid SFHAs 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

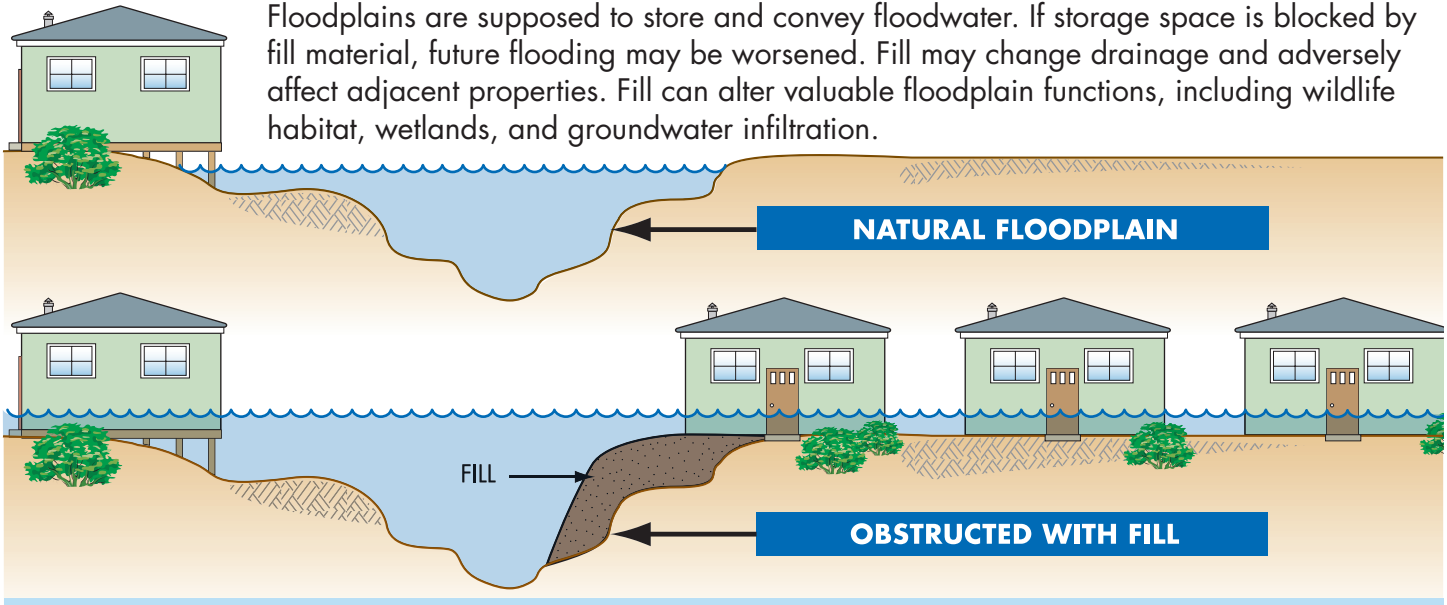
Floodplain land put into public/ common open space, net density remains, lot sizes reduced and setbacks modified to keep homesites on high ground.

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.

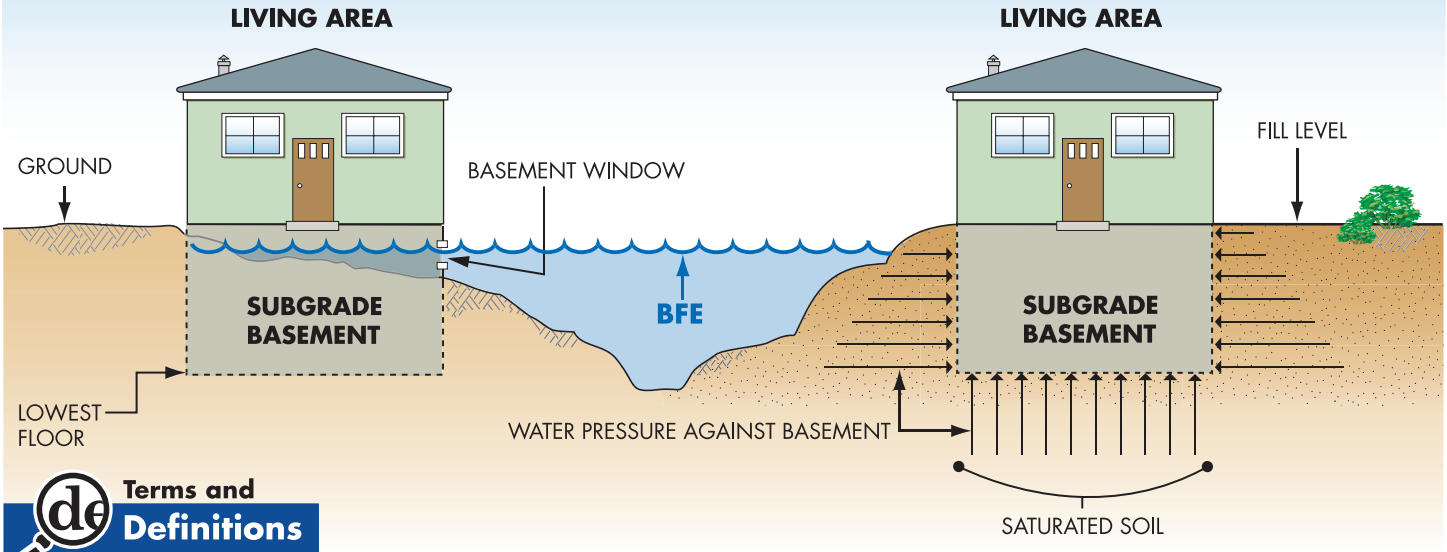
Fill Can Adversely Affect Floodplain Functions

Floodplains are supposed to store and convey 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 can adopt higher standard language for compensatory storage in local flood damage prevention ordinances. This would require compensating excavation to offset the loss of flood storage associated with projects that propose placing fill in floodplains.

Basements in Flood Zones Are Unsafe

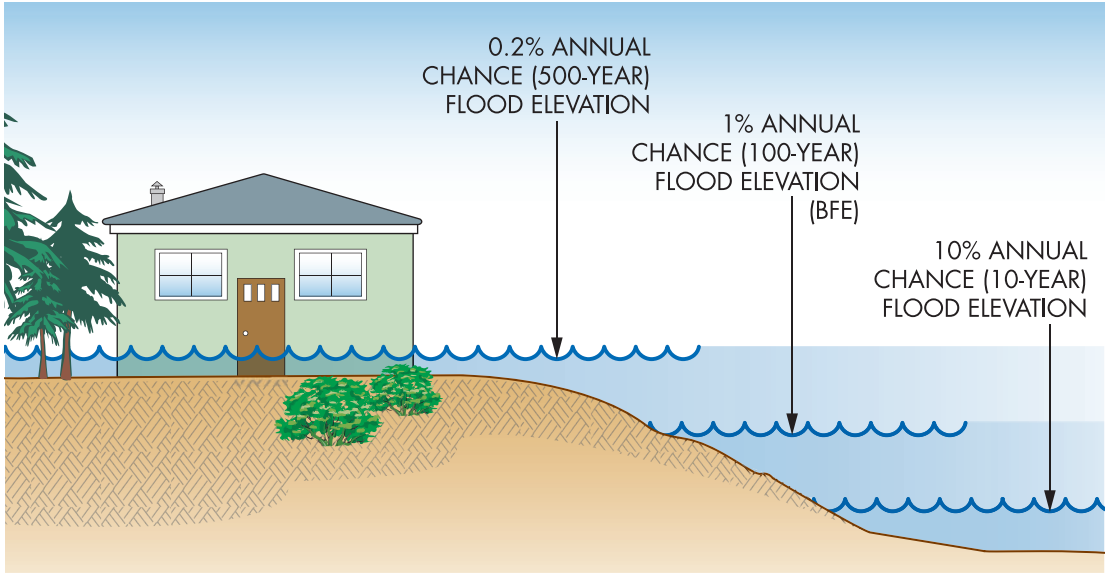


Terms and Definitions

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

New buildings are not allowed to have basement floors below the BFE and NFIP flood insurance coverage is very limited in existing basements. 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.

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 a 1 in 4 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 1 in 20!

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 49 to see how this will avoid damage and may lower your NFIP flood insurance costs.

Freeboard: Build Higher, Reduce Damage, Save on NFIP Insurance

Freeboard is additional height – a factor of safety – above the BFE. Buildings that are higher than the BFE experience less flood damage.

- The NYS Uniform Code requires at least 2 feet of freeboard.
- Some communities adopt higher freeboard requirements.
- Owners and builders may add more freeboard to better protect their buildings and contents.
- Owners of buildings that are elevated above the BFE may save on NFIP flood insurance premiums.

Important Information

Remember! Builders must submit floor elevations as part of foundation inspections. An error of just 6 or 12 inches could be costly for all future owners.

Important Information

Possible NFIP Insurance Savings: For older buildings, some low-cost damage reduction actions may result in discounts in NFIP flood insurance premiums:

- Elevate machinery and equipment (M&E) to a higher floor.
- Install flood openings in walls of enclosures and attached garages used only for parking, building access, and limited storage.

Limiting Rises Where Floodways Not Delineated

Buildings and Structures. New buildings and structures, substantial improvements, and additions are not permitted in Zone A or Zone AE where floodways have not been delineated, unless applicants provide certification prepared by experienced Professional Engineers that show sites are flood fringes, without causing flood level increases more than Allowable Increases (below).

Other Development. When development such as filling, grading, alteration of a watercourse, and culverts and bridges are proposed where floodways have not been delineated, communities must determine proposed projects will not cause more than Allowable Increases (below).

Allowable Increases (Rises). In Zone A and Zone AE where floodways have not been delineated, allowable cumulative increase (rise) in flood level is:

- Up to 1 foot, as long as there is no increased flood damage potential (i.e., no existing buildings are in or touching the floodplain).
- No more than 0.00 feet, if existing buildings are impacted.

Flood studies and floodway/flood fringe determinations for development and subdivisions of 50 lots or 5 acres (whichever is lesser) must be certified by experienced Professional Engineers.

PERMIT APPLICATIONS, REVIEWS, AND ELEVATION CERTIFICATES

Carefully Complete the Permit Application

Part of Floodplain Development Permit Application (only key parts shown)

Application No.: 2023-12 Date Filed: 3/23/2023

Applicant: David and Sally Jones

Type of Development: ❑ New construction ❑ Residence ❑ Commercial
❑ Multifamily ❑ Warehouse/Industrial ❑ Addition ❑ Repair
❑ Accessory Structure/Garage ☑ Fill/Grading ❑ Culvert/Bridge
❑ Other (describe): _____

Property located in Zone AE on FIRM dated: 12/9/2014

Location is: ❑ Floodway/Fringe not determined. ☑ Fringe. ❑ Floodway.

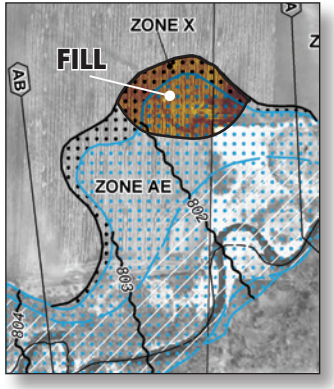
Base Flood Elevation (BFE) at site: 802.0 Datum: ❑ NAVD, 1929

Flood Protection Elevation (FPE) at site: 804.0 ☑ NAVD, 1988

Approved by: Robert Reviwer Title: Building Official Date: 5/18/2023

Important Information

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



Good information will lead to better construction and less exposure to future flood damage. Contact the local floodplain administrator or building, planning, zoning, or engineering department for application forms and guidance.

Some Key Floodplain Development Permit Review Steps

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

- Is the site in the mapped flood zone or floodway?
- Is the natural ground elevation below the BFE?
- 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 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?
- Have all required State and federal permits been issued before the local permit is issued?

Communities Must Retain Flood Records Permanently

Communities that participate in the NFIP agree to maintain certain documentation for all development in flood zones, including but not limited to:

- Permits issued and variances granted
- Letters of Map Change (LOMA, LOMR-F, CLOMR, and LOMR)
- Floodway encroachment "no rise" certificates and watercourse alteration documentation
- Design certifications for engineered openings
- Design certifications for dry floodproofed buildings
- Design certifications for buildings in Zone V and Coastal A Zones
- Determinations of whether alterations, improvements or additions to existing buildings are substantial improvements
- Determinations of whether damaged buildings are substantially damaged
- "As-built" building elevations (Elevation Certificates) completed by a licensed Land Surveyor
- Variance documentation

Maintaining permanent records allows communities to respond to citizen inquiries and to provide documentation to FEMA and NYSDEC as part of Community Assistance Visits (CAV).

Variances From Floodplain Management Requirements

Very specific criteria related to the property (not the owner's actions or preferences) must be satisfied to justify a variance. NFIP variance requirements include:

- A showing of good and sufficient cause.
- Determination that failure to grant the variance would result in exceptional hardship.
- The variance will not result in increased flood heights, additional threats to public safety, extraordinary public expense, create nuisances, or cause fraud or victimization of the public.
- The variance is the minimum action necessary to afford relief.

A variance that allows construction or substantial improvement below the BFE does not waive the lender's flood insurance requirement. Buildings with lowest floors below the BFE may have more expensive flood insurance premiums.

Important Information

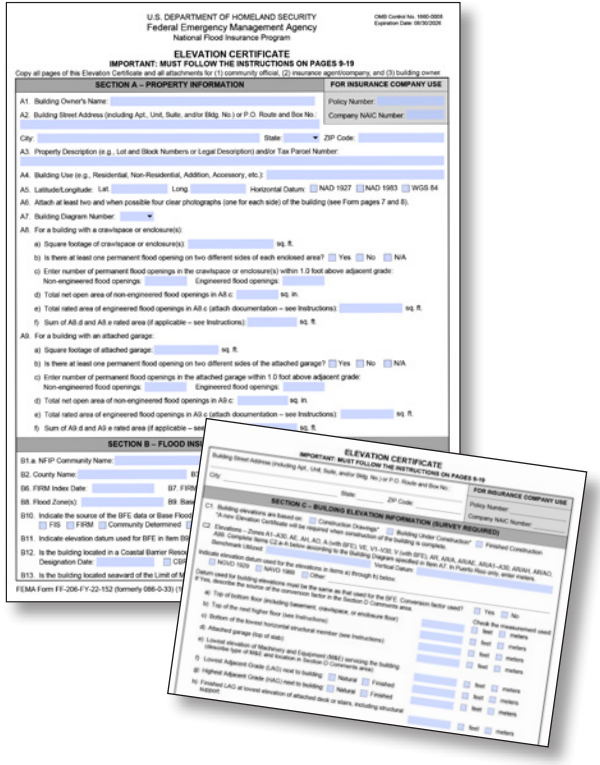
NFIP regulations for variances are in 44 CFR § 60.6 and guidance is in FEMA P-993, *Variances and the National Flood Insurance Program*.

State variances from the NYS Code Council are required for variations from the flood requirements of the NYS Uniform Code.

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

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 licensed Land Surveyor.
- Community officials may complete the EC for buildings in Zone AO.
- It can be used to show lowest grades adjacent to planned or existing building sites are above the Base Flood Elevation (see page 33).
- It is used to verify building and equipment elevations.
- Insurance agents can use the EC to determine if better NFIP flood insurance policy rates are available.


U.S. DEPARTMENT OF HOMELAND SECURITY
Federal Emergency Management Agency
National Flood Insurance Program

ELEVATION CERTIFICATE
IMPORTANT: MUST FOLLOW THE INSTRUCTIONS ON PAGES 9-19

SECTION A – PROPERTY INFORMATION | FOR INSURANCE COMPANY USE

SECTION B – FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

SECTION C – BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

By itself, the EC **cannot** be used to waive the mortgage lender requirements to obtain flood insurance. See page 34 to learn about FEMA's Letter of Map Amendment process.

ELEVATION CERTIFICATE
(partial)

SECTION C – BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

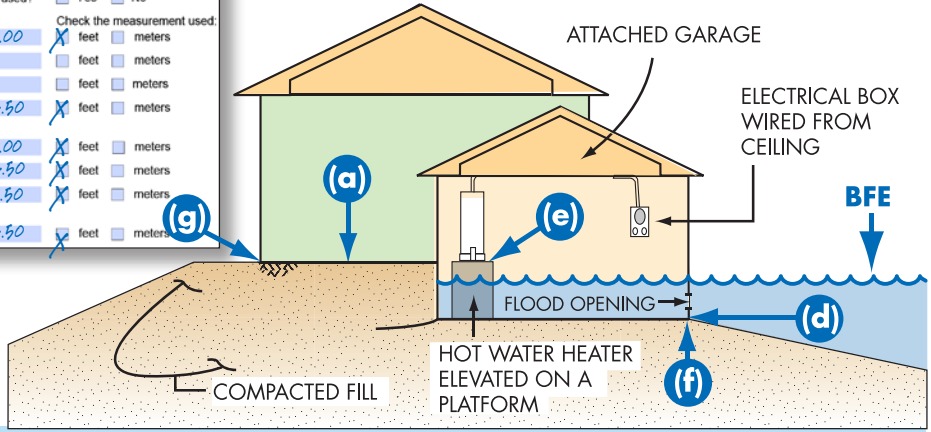
C1. Building elevations are based on: ☐ Construction Drawings* ☐ Building Under Construction* ☒ Finished Construction
*A new Elevation Certificate will be required when construction of the building is complete.

C2. Elevations – Zones A1–A30, AE, AH, AO, A (with BFE), VE, V1–V30, V (with BFE), AR, AR/A, AR/AE, AR/A1–A30, AR/AH, AR/AO, A99. 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:

Datum used for building elevations must be the same as that used for the BFE. Conversion factor used? ☐ Yes ☐ No
If Yes, describe the source of the conversion factor in the Section D Comments area.

		Check the measurement used:	
a) Top of bottom floor (including basement, crawlspace, or enclosure floor):	227.00	☒ feet	☐ meters
b) Top of the next higher floor (see Instructions):	N/A	☐ feet	☐ meters
c) Bottom of the lowest horizontal structural member (see Instructions):	N/A	☐ feet	☐ meters
d) Attached garage (top of slab):	222.50	☒ feet	☐ meters
e) Lowest elevation of Machinery and Equipment (M&E) servicing the building (describe type of M&E and location in Section D Comments area):	227.00	☒ feet	☐ meters
f) Lowest Adjacent Grade (LAG) next to building: ☐ Natural ☒ Finished	222.50	☒ feet	☐ meters
g) Highest Adjacent Grade (HAG) next to building: ☐ Natural ☒ Finished	226.50	☒ feet	☐ meters
h) Finished LAG at lowest elevation of attached deck or stairs, including structural support:	222.50	☒ feet	☐ meters

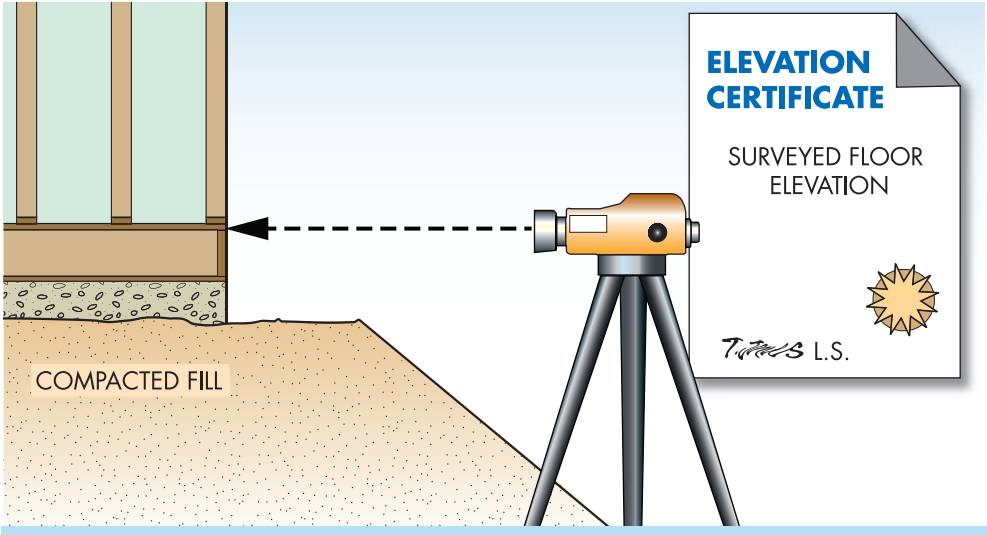


In this example, the BFE is 225.0 feet.

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).

New York State communities should require 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 licensed Land Surveyor must fill out and seal the surveyed elevations. The EC includes diagrams for different building types. Several points must be surveyed.

Paperwork is Important



Terms and Definitions

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 is limited to parking, limited storage, and building access and it is built as required by the NYS Uniform Code. Crawlspaces are enclosures.

"As-built" Elevation Certificates must be submitted before the final inspection. Surveyors collect information helpful to verify compliance, including flood openings and elevation of equipment.

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

BUILDING REQUIREMENTS: ALL BUILDINGS

Fundamentals of Flood Resistant Construction

Two objectives of the NFIP are to reduce flood damage and guide development to less hazard prone areas. When buildings are built in special flood hazard areas, increased resistance to flooding is achieved by the following fundamentals:

- **Foundations** capable of resisting flood loads (including dry floodproofed nonresidential buildings)
- **Lowest floors elevated** at least 2 feet above the BFE
- **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 designed to minimize damage
- **Flood damage-resistant materials** used below elevated lowest floors

Important Information

Critical and essential facilities such as hospitals, fire stations, police stations, and buildings where hazardous materials or critical records are stored should be located outside of the floodplain. But when they must be located in the floodplain, NYS Uniform Code requires them to be elevated at 2 or 3 feet above the BFE. Facility owners should develop emergency plans for actions to take before the onset of flooding, during floods, and after floodwater recedes.

In short ... keep your community resistant to flooding!

NYS Uniform Code Includes Flood Requirements

The NYS Uniform Code is based on the International Codes. It includes flood provisions that meet or exceed the NFIP requirements for buildings and structures. All counties, cities, towns and villages are required to enforce the Uniform Code. Some communities enforce "higher standards" than those required by the Uniform Code. New York City adopts its own code (see page 61).

- **Building Code of New York State (BCNYS):** Flood provisions are primarily in Section 1612 Flood Loads, which refers to the standard *Flood Resistant Design and Construction* (ASCE 24).
- **BCNYS Appendix G:** Appendix G is informative only, not part of the Uniform Code. It may be locally adopted. It includes flood map duties, variances, and development other than buildings, including subdivisions, site improvements, floodway encroachments, watercourse alterations, manufactured homes, recreational vehicles, tanks, temporary storage and structures, and miscellaneous structures.
- **Residential Code of New York State (RCNYS):** Flood provisions are primarily in Section R322 Flood-Resistant Construction, although there are requirements in several other sections.
- **Existing Building Code of New York State (EBCNYS):** Flood provisions are found in sections on repairs, alterations, additions, and historic structures, and in sections on prescriptive and performance compliance methods.
- **Plumbing, Mechanical, and Fuel Gas Codes of New York State:** Flood provisions are in a number of sections.

View the Uniform Code, with State amendments, at https://codes.iccsafe.org/codes/new-york and view FEMA's excerpts of flood provisions of the International Codes and "Highlights of ASCE 24" at www.fema.gov/emergency-managers/risk-management/building-science/building-codes/flood.

Specific Requirements in the NYS Uniform Code

The NYS Uniform Code includes requirements that may differ from NFIP and local floodplain management regulations – the more restrictive prevail:

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

New York City Floodplain Management Requirements

Due to its population, state law authorizes New York City to adopt its own building codes. The city's floodplain management regulations and requirements that govern buildings and structures in SFHAs are in Appendix G of the New York City construction codes.

The New York City Department of Buildings is responsible for administering and enforcing the building code and floodplain requirements. Some ways the city's requirements differ from other communities are:

- Cites Preliminary FIS and Preliminary FIRMs (developed in 2018), in addition to the effective FIS and FIRMs.
- Has specific provisions for FEMA Letters of Map Change.
- Requires all buildings, including one- and two-family homes, to comply with Appendix G and ASCE 24 (as modified by the city).
- Requires "wet floodproofing certification" for enclosures below elevated buildings, and "utility certifications."
- Certificates of occupancy describe enclosed areas below elevated buildings and dry floodproofed spaces.
- Requires specific inspections for dry floodproofed buildings, including annual inspections and triennial full-scale deployment inspections.
- Expands several aspects of the ASCE 24 dry floodproofing requirements Building lots in proposed subdivisions must have buildable area outside of floodways.
- Includes specifics for Flood Design Class 4 buildings in "shaded X-Zones," including temporary external generators, boilers, and chillers.

Floodplain Management Requirements for State Projects

All **state agencies** are required to ensure that the "use of State lands and the siting, construction, administration and disposition of State-owned and State-financed facilities are conducted in ways that will minimize flood hazards and losses" (NYCRR, Title 6, Part 502). The regulations establish floodplain management criteria that are equivalent to the requirements adopted by communities and the flood resistant provisions of the NYS Uniform Code.

Before acquiring interest in, or financing acquisition of any interest in, any land or facility, state agencies must:

- Determine if the land or facilities are in SFHAs and whether contemplated use of the property is compatible with the regulations.
- "Floodproof" any existing structures in SFHAs.
- Not acquire existing structures in floodways for any use involving human habitation.

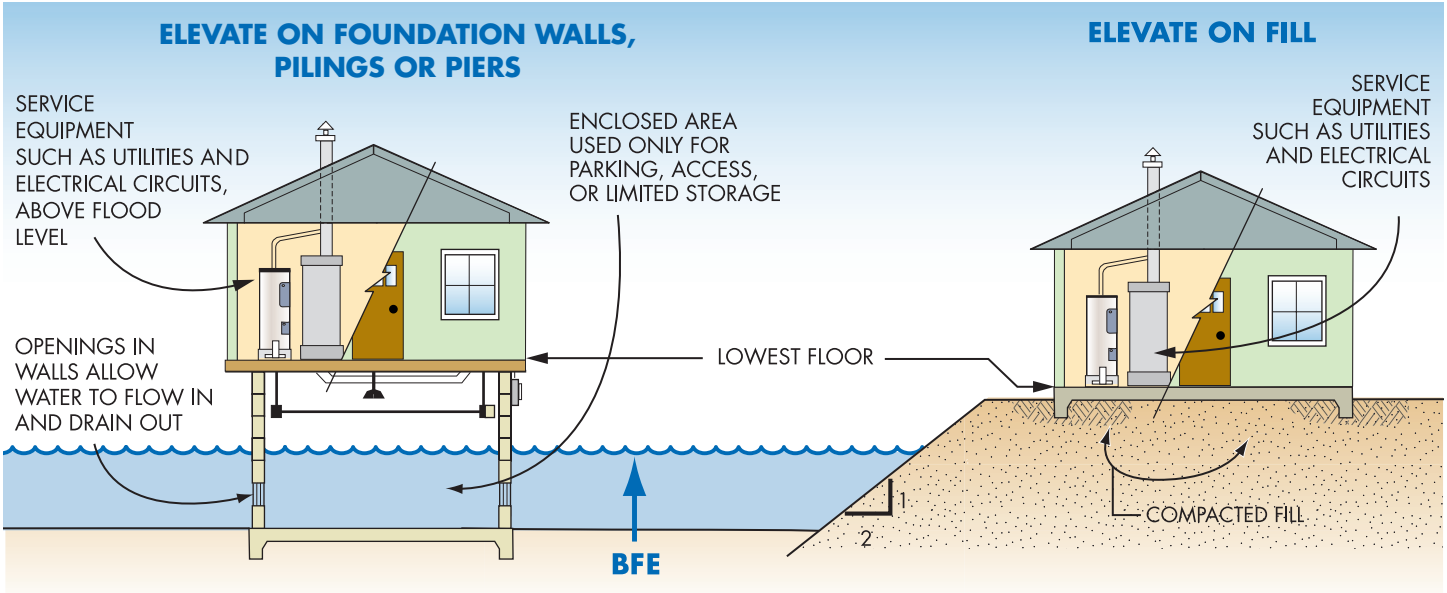
State agencies undertaking projects subject to Part 502 are not required to obtain local floodplain permits because they "self regulate" under the authority of those regulations. State agencies work with NYSDEC if they are unable to comply with the requirements because NYSDEC is the variance granting agency for all state projects in SFHAs.

Terms and Definitions

State Agency is "any department, bureau, commission, board or other agency of the State, or a public benefit corporation or public authority at least one of whose members is appointed by the Governor."

BUILDING REQUIREMENTS: FLOOD ZONE A/AE

How to Elevate Buildings in Flood Zone A/AE

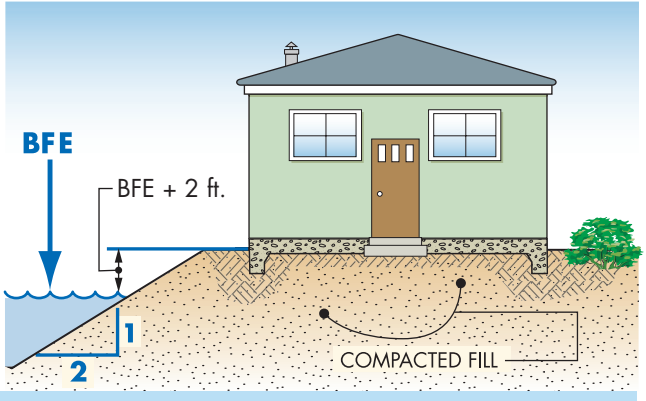


CAUTION! Enclosures (including crawlspaces) have specific requirements (see page 66). Note: When the walking surface of the lowest floor is at the required BFE + 2 ft., under-floor utilities must be specially designed (see page 66). Fill used to elevate buildings must be placed properly (see page 64).

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
- 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 pages 17 and 20)



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. In Zone V, buildings on fill are not permitted. In Coastal A Zones, the NYS Uniform Code limits use of fill to backfilled stem walls.

Non-Residential and Mixed-Use Buildings in Flood Zone A/AE

The NYS Uniform Code includes requirements for nonresidential buildings and mixed-use buildings in SFHAs identified as flood Zone A/AE:

- Elevated nonresidential and mixed-use buildings must have lowest floors at or above the BFE plus 2 feet.
- Dry floodproofed nonresidential buildings and nonresidential portions of mixed-use buildings must be designed to be dry floodproofed to or above the BFE plus 2 feet. Permit applications must include statements by registered design professionals that the dry floodproofing measures are designed in accordance with ASCE 24 (see definition).
- Below-grade parking garages for nonresidential buildings are allowed only if they are dry floodproofed to or above the BFE plus 2 feet.

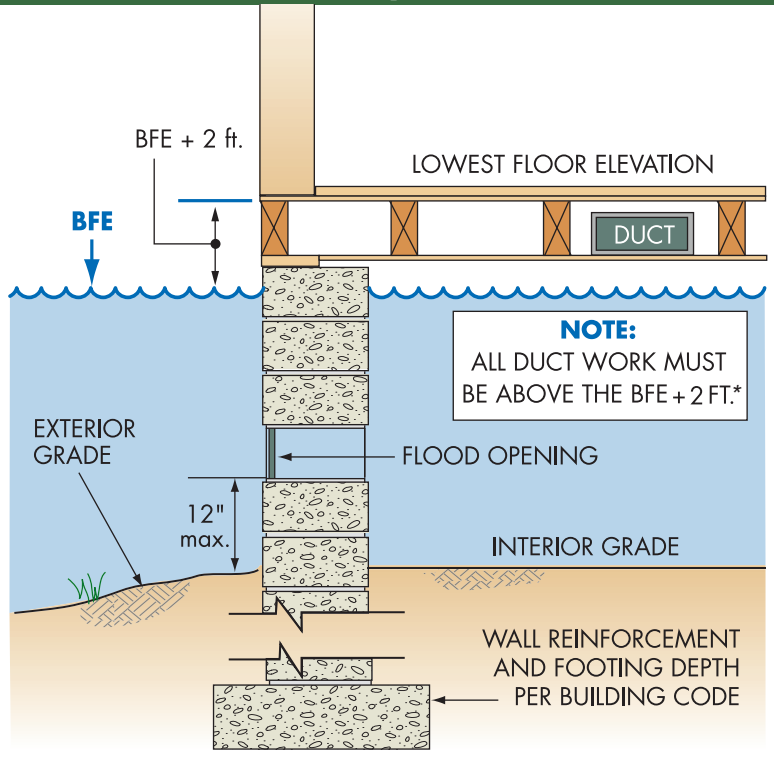
In addition to the dry floodproofing requirements of ASCE 24, designers should review FEMA guidance in NFIP Technical Bulletin 3, *Requirements for the Design and Certification of Dry Floodproofed Non-Residential and Mixed-Use Buildings*, and NFIP Technical Bulletin 6, *Requirements for Dry Floodproofed Below-Grade Parking Areas Under Non-Residential and Mixed-Use Buildings*. Go to www.fema.gov and search to download the NFIP Dry Floodproofing Certificate.

Terms and Definitions

The NYS Uniform Code defines **dry floodproofing** as a combination of design modifications that results in a building or structure, including the attendant utilities and equipment and sanitary facilities, being watertight with walls substantially impermeable to the passage of water and with structural components having the capacity to resist loads as identified in ASCE 7."

ASCE 24, a standard referenced by the Uniform Code (see page 59) defines the terms residential, non- residential, and mixed-use.

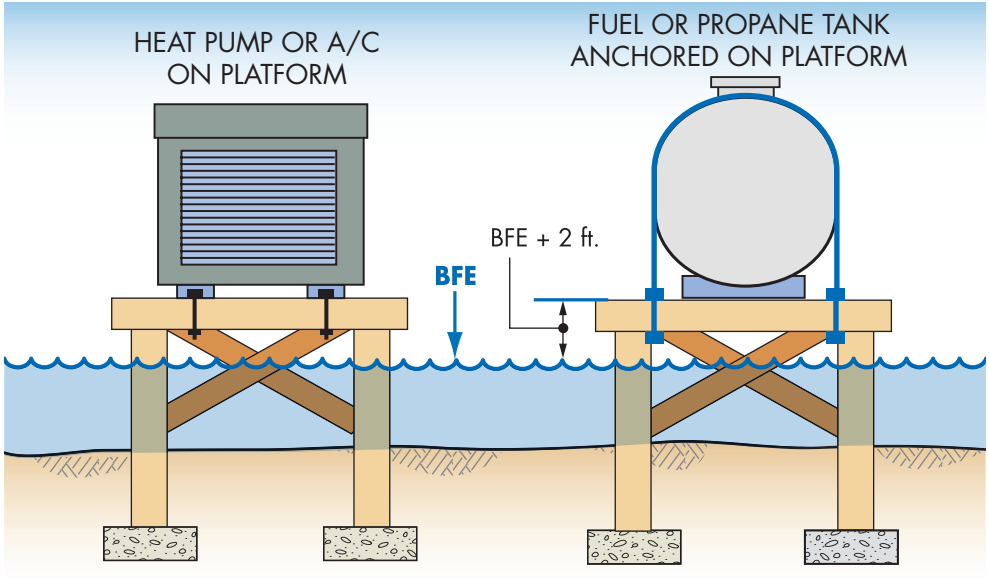
Enclosures and Crawlspace Details (Zone A/AE)



**Unless specifically designed to meet exception to R322.1.6.*

- The NYS Uniform Code requires the Lowest Floor at or above BFE plus 2 feet.
- All materials below the lowest floor must be flood resistant.
- Interior grade or floor must be equal to or higher than exterior grade on at least one side.
- 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.
- 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.
- See FEMA Technical Bulletin 1, *Requirements for Flood Openings in Foundation Walls and Walls of Enclosures*.

Utility Service, Equipment, and Tanks (Outside)



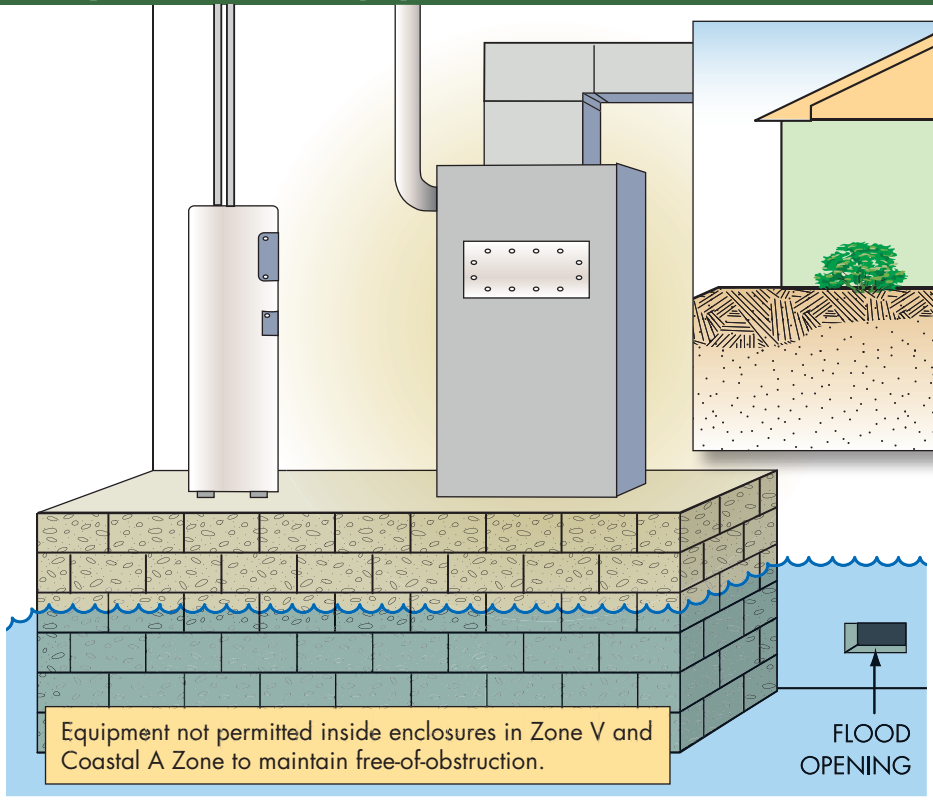
Important Information

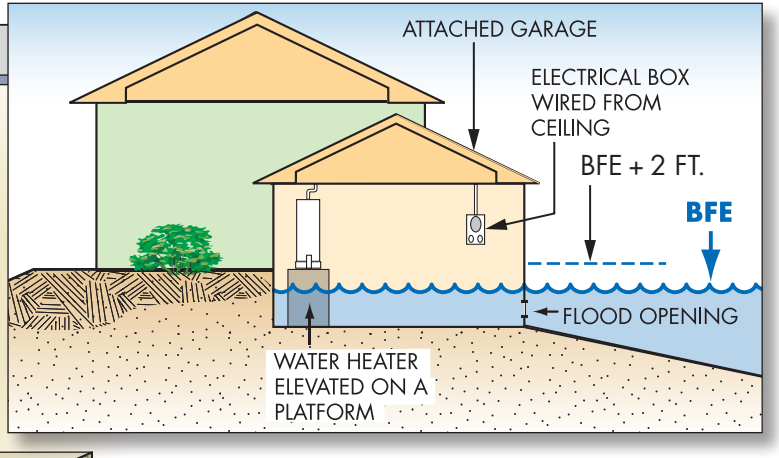
Fuel and propane tanks may explode or release contents during flooding. Even shallow water can create large buoyant forces on tanks. All tanks must be anchored to resist flood loads. Tanks may be underground, elevated on platforms, or at-grade.

In Zone V and CAZ, at-grade tanks must be underground or elevated to avoid obstructing waves and water.

Fuel and propane tanks can pose serious threats to people, property and the environment during flood conditions. Search online for the FEMA video on "Anchoring Home Fuel Tanks."

Utility Service and Equipment Inside Enclosures





Equipment (including ductwork) must be elevated to or above the BFE + 2 feet.* 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.

**Unless specifically designed to meet exception to R322.1.6.*

BUILDING REQUIREMENTS: FLOOD ZONE V AND COASTAL A ZONE

General Requirements in Zone V and Coastal A Zone

Flood Insurance Rate Maps for coastal communities and the Great Lakes shorelines may show coastal high hazard areas (Zone V) and Coastal A Zones (CAZ).

The fundamental requirements for flood resistant construction apply and:

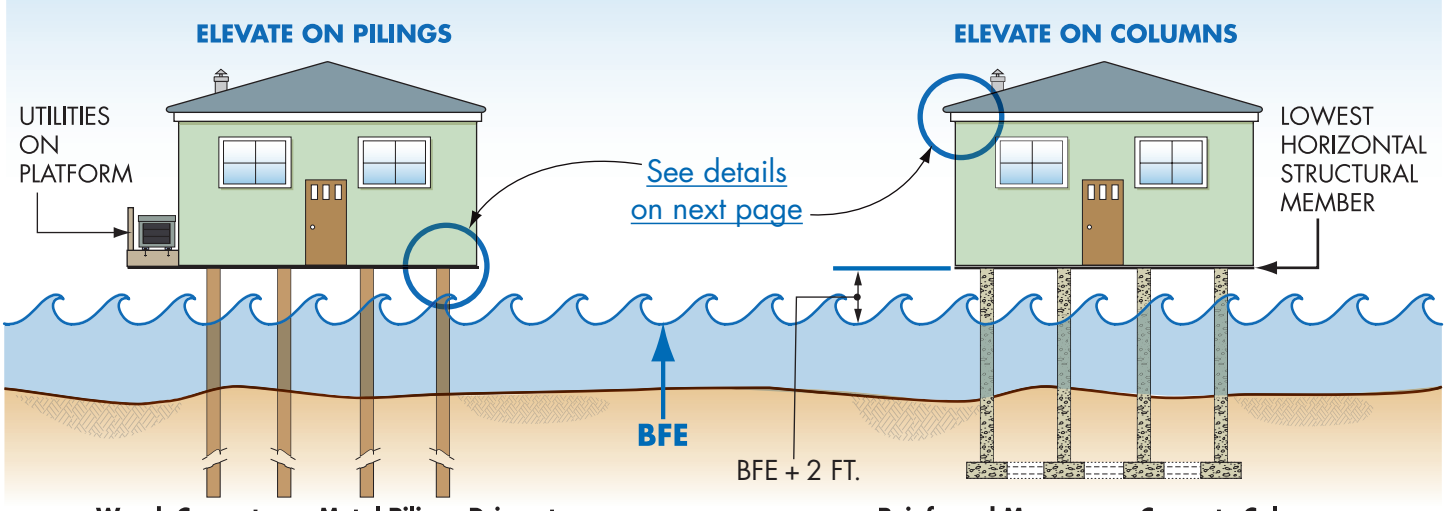
- Buildings must be elevated on "open" foundations (pilings and columns) to allow waves and water to pass under without imposing significant wave forces (see page 70).
- The lowest horizontal structural member of the lowest floor must be elevated to or above the BFE + 2 feet.
- Foundation designs must be prepared and certified by registered design professionals (see page 73).
- Walls of enclosures below elevated buildings must be designed to break away and have flood openings (see page 72).
- Utility service and equipment must be elevated, and tanks must be anchored and either elevated or underground (see page 67).

Terms and Definitions

Coastal High Hazard Areas (Zone V) are shown on FIRMs to identify areas subject to high velocity wave action during base flood conditions. In Zone V, waves may be 3 ft high or higher.

Where FIRMs show a Limit of Moderate Wave Action (LiMWA), the area between the LiMWA and Zone V boundary or shoreline is the Coastal A Zone (CAZ). The building code treats CAZ similar to Zone V.

How to Elevate Buildings in Zone V and CAZ

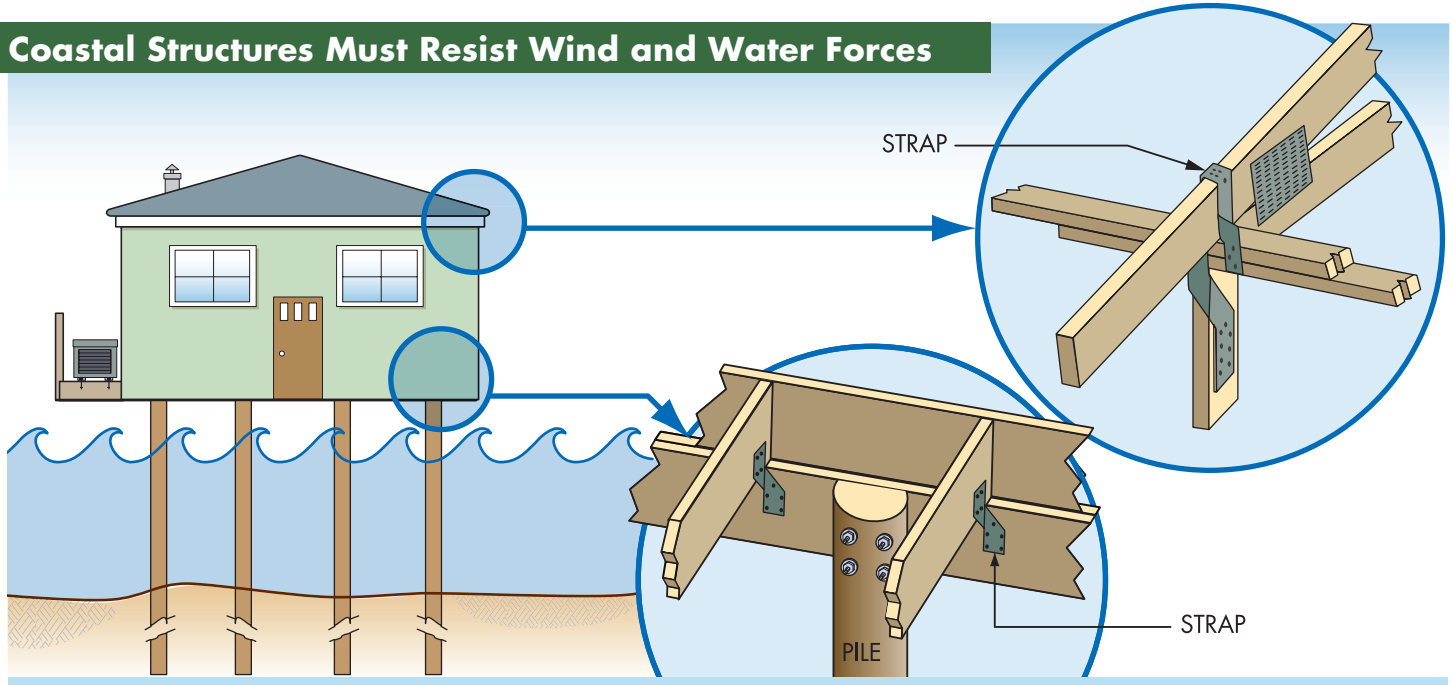


Wood, Concrete, or Metal Pilings Driven to Proper Depth Offer More Protection Against Scour

Reinforced Masonry or Concrete Columns Anchored to Rock

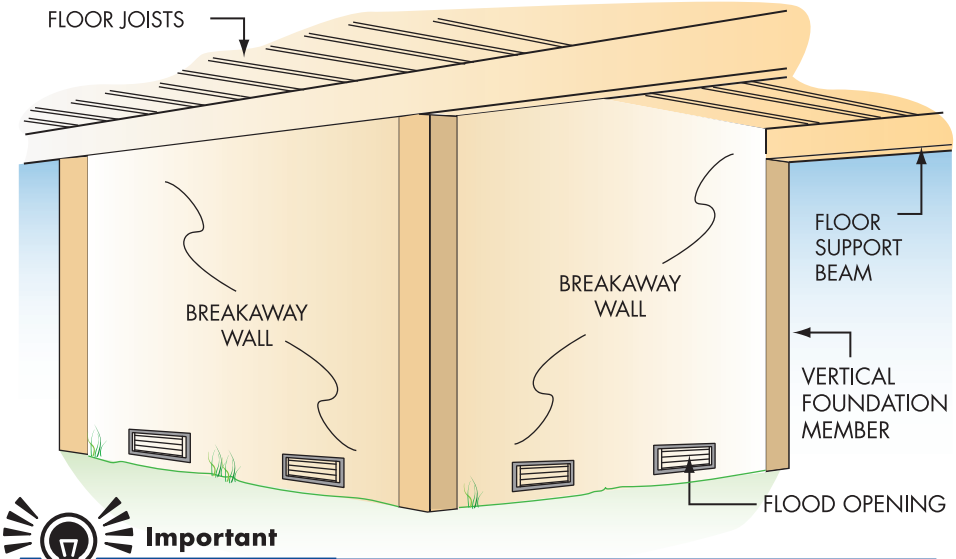
In Zone V and CAZ, the design specifics will be determined by an architect or engineer based on the site, including how the building will be elevated and how deep the foundation elements will be in the ground. A Zone V design certificate or statement will be required (see page 73).
For more information see FEMA P-499, *Homebuilder's Guide to Coastal Construction*.

Coastal Structures Must Resist Wind and Water Forces



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.

Enclosures Below Zone V and CAZ Buildings



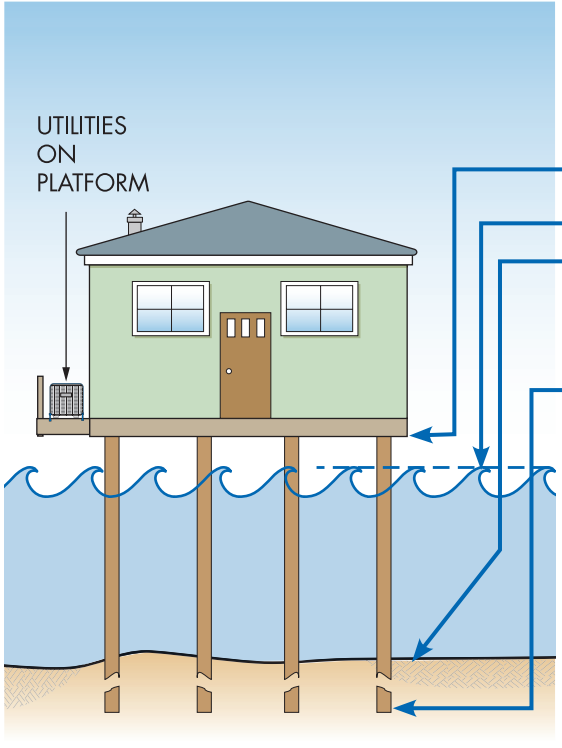
Important Information

It is a violation if enclosures below elevated buildings are modified or used for purposes other than parking, storage, and building access. Not only will damage be increased during floods, but NFIP flood insurance policies may be more expensive. Communities may adopt requirements for non-conversion agreements.

Enclosures under elevated buildings should be avoided. If areas are enclosed, the NYS Uniform Code 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)

The Zone V and CAZ Design Certificate



ZONE V and CAZ DESIGN CERTIFICATE (Partial)

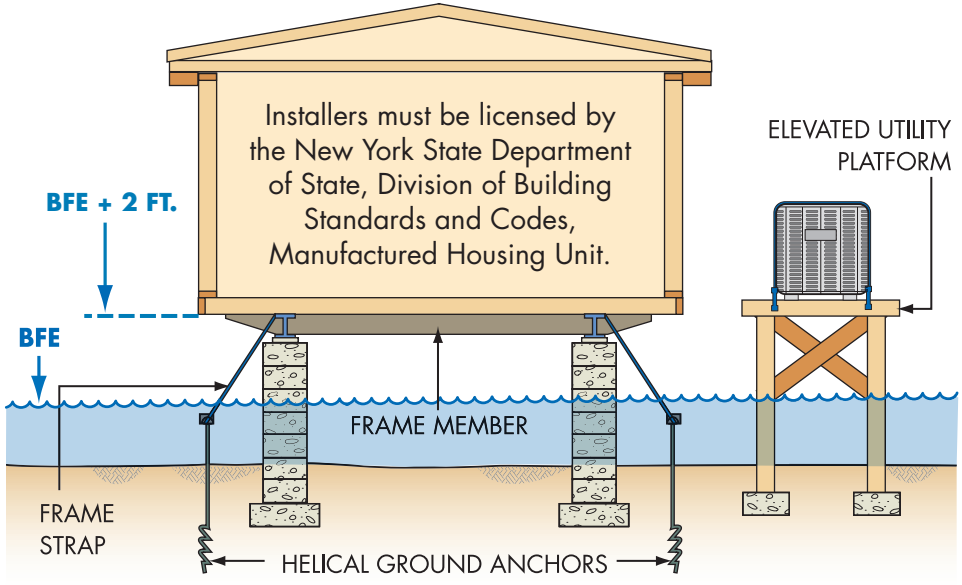
Elevation Information Used for Design

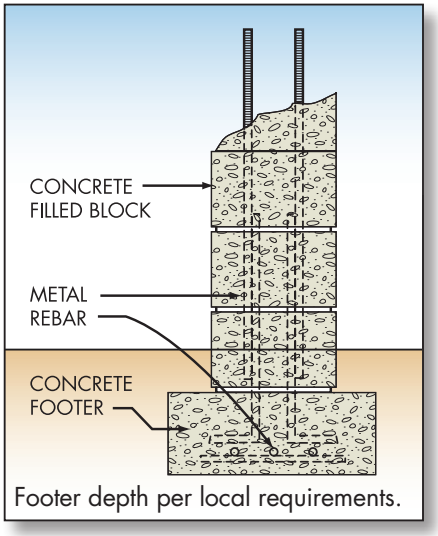
1. Datum..... ☐ NGVD ☒ NAVD ☐ Other
2. Elevation of the Bottom of Lowest Horizontal Structural Member..... 16.0 feet above datum
3. Base Flood Elevation (BFE)..... 14.0 feet above datum
4. Elevation of Lowest Adjacent Grade..... 8.5 feet above datum
5. Approximate Depth of Anticipated Scour/Erosion used for Foundation Design..... 1 feet
6. Minimum Embedment Depth of Column Footings or Pilings (or until refusal) Below Lowest Adjacent Grade.. 8 feet

Construction documents must include documentation prepared and sealed by a registered professional engineer or architect stating that the design and methods of construction meet the applicable requirements of the NYS Uniform Code and local floodplain regulations.

OTHER STRUCTURES AND DEVELOPMENT

Manufactured Homes Require Special Attention





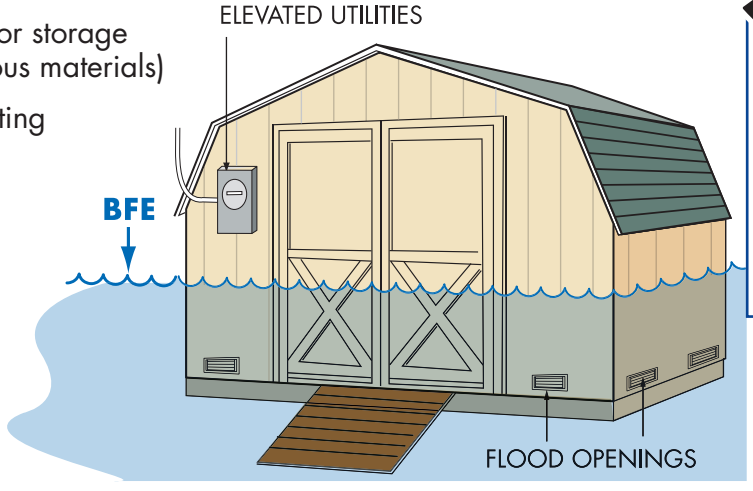
Experience shows that manufactured homes are easily damaged. Just a few inches of water above the floor can cause substantial damage.

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 NYS Residential Code, is accessory to and incidental to a dwelling and is located on the same lot as a dwelling.

Sheds and detached garages in flood zones are "development" and permits are required. By policy, FEMA limits the size of non-elevated wet floodproofed accessory structures in Zone A/AE to 600 sq. ft. **Caution!** Remember, everything inside will get wet when flooding occurs.

Recreational Vehicles

In flood zones, recreational vehicles (RVs) must:

- Be licensed and titled as an RV (not as a permanent residence)
- Be built on a single chassis
- Must measure 400 sq.ft. or less (measured at largest horizontal projection)
- Be road-ready, with 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
- RV parks in floodways must satisfy the no-rise requirement (see page 20)

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 the above conditions must be installed and elevated like manufactured homes (see page 74), including permanent foundations.

Agricultural Structures

Communities may adopt regulations to grant variances to allow certain agricultural structures to be "wet floodproofed" rather than elevated or dry floodproofed. FEMA specifies:

- Variances must be granted for individual agricultural structures
- Applicants must justify variances, including low damage potential and the anticipated hardship if variances are not granted
- Except for size limits, the accessory structure requirements also apply to agricultural structures (see page 75)

As an alternative to handling individual agricultural structures by variance, communities may seek a "community-wide exception" from FEMA. If approved, the exception allows communities to issue permits under specified conditions.

FEMA issued a policy on agricultural structures and accessory structures in early 2020. The policy, *Floodplain Management Bulletin*, FEMA P-2140, and fact sheets are available on FEMA's web site. Contact floodplain@dec.ny.gov with questions.

Important Information

Agricultural Structure is defined by FEMA policy as a structure that is used exclusively in connection with the production, harvesting, storage, raising, or drying of agricultural commodities and livestock. Aquaculture is farming conducted in or over water. Structures used for human habitation are not agricultural structures, even when located on agricultural land.

Pools in Flood Hazard Areas

Pools in flood hazard areas should be designed and constructed to be stable during flooding. Empty pools may be dislodged if the surrounding soil becomes saturated. Where a pool is located and whether it is in-ground, above-ground, or a combination (perhaps with associated grading and fill) determine requirements:

- **Floodway:** Pools may be allowed in floodways provided the no-rise requirements are satisfied (see page 20). Where BFEs are specified but when a floodway is not delineated, an analysis is required (see page 50).
- **Flood Fringe:** Pools may be permitted in flood fringe areas without encroachment analyses.
- **Zone V and Coastal A Zone:** Pools in these flood hazard areas should be designed in accordance with ASCE 24. Pools located near or under buildings must be in-ground with decks flush with original grade to avoid being obstructions that could divert water and waves toward buildings.

In addition:

- **Pool fencing** should be made of flood damage-resistant materials
- **Pool houses** must be elevated to or above the BFE plus 2 feet if used for any purpose other than storage.
- **Pool controls and equipment** must meet the requirements for utility service (see page 67).

Solar Power Facilities and Solar Panels in Flood Hazard Areas

Solar power facilities that generate power for off-site consumption (sometimes called solar farms or solar arrays), and **ground-mounted solar panels** that serve individual buildings, are allowed in SFHAs provided:

- **Floodway:** Avoid floodway locations. If unavoidable, the floodway "no-rise" requirement must be satisfied (see page 20). Where BFEs are specified but a floodway not delineated, an analysis is required (see page 50).
- **Flood Fringe:** The structures are allowed in flood fringe areas if they are:
  - ❏ Designed with fully tilted solar panels at least 2 feet above BFE (or 3 feet above grade if FIRM does not have BFEs)
  - ❏ Anchored to prevent flotation, collapse, or lateral movement during base flood conditions
  - ❏ Constructed with flood damage-resistant materials below the BFE
- **Buildings:** Buildings and equipment serving buildings must comply with the NYS Uniform Code

Roof-mounted solar panels are allowed on buildings in SFHAs provided the roofs and connections to electric service are above the BFE + 2 feet.

Contact floodplain@dec.ny.gov for a copy of NYSDEC's *Floodplain Management Guidelines for Solar Array and Wind Farm Projects*.

EXISTING BUILDINGS

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 have an independent licensed appraiser determine the Actual Cash Value (in-kind replacement, depreciated).
- 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 (or the repair of Substantial Damage).
- Encourage owners to consider other ways to reduce future damage if the comparison is less than 50% (see page 96).

Full compliance with the NYS Uniform Code is required when destroyed buildings and demolished buildings are replaced.

Important Information

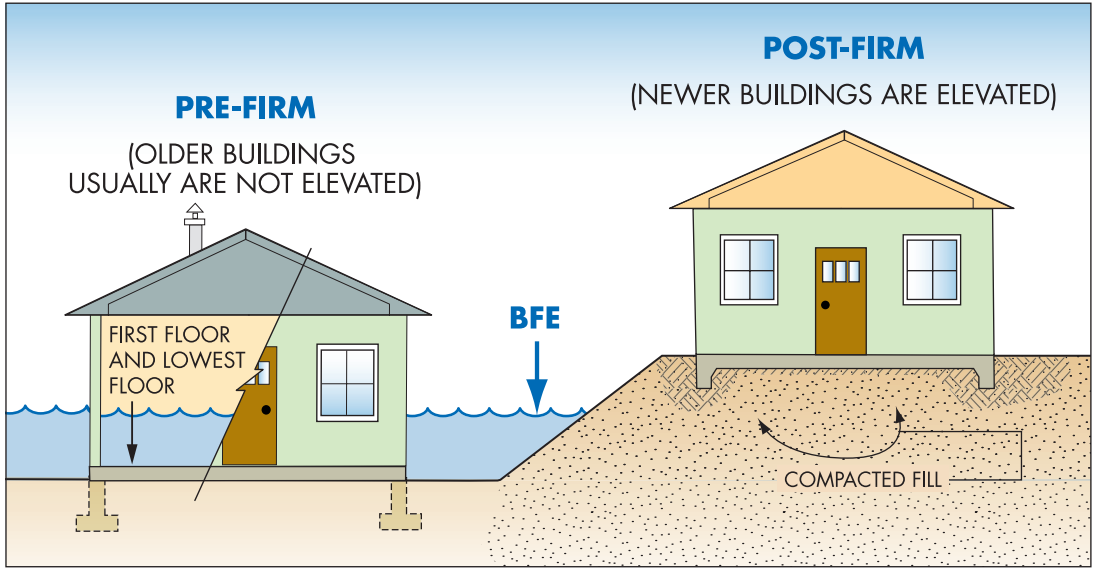
Improvements include:

- Non-substantial improvements (see pages 86 and 87)
- Alteration, renovation, rehabilitation of the interior of the existing building (see page 88)
- Lateral additions, with and without improvement of the existing building (see pages 90 and 91)
- Vertical addition (add new story)

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

Pre-FIRM and **Post-FIRM** are NFIP insurance terms tied to a community's initial Flood Insurance Rate Map (FIRM). At one time, the NFIP used the terms to determine flood insurance rates. Although common, the terms should not be used to distinguish between buildings constructed before a community joined the NFIP and those built after, especially in communities where the FIRMs have been revised.

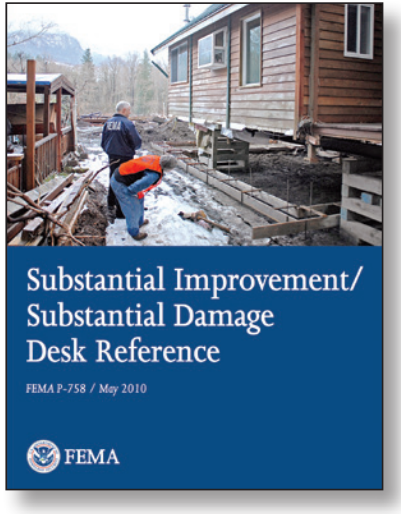
Existing buildings and non-conforming buildings in SFHAs must be brought into compliance when work is determined to be substantial improvement or repair of substantial damage.



Substantial Improvement/Substantial Damage Desk Reference

FEMA's SI/SD Desk Reference (FEMA P-758) provides guidance and suggested procedures for:

- Estimating costs of improvements and costs of repairs (see page 84)
- Estimating market values
- Community and property owner responsibilities
- Administrative requirements
- Key aspects of bringing buildings into compliance
- Suggestions for preparing for disasters

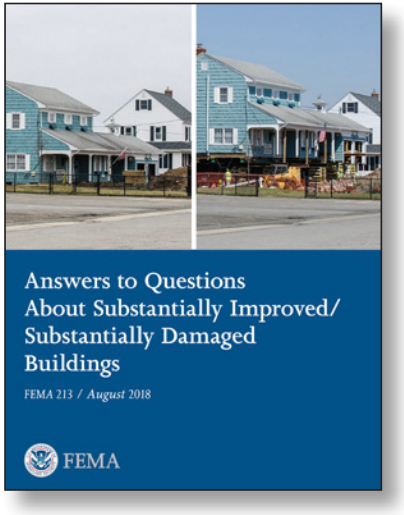


Terms and Definitions

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, snow, tornadoes, etc.), regardless of the actual repair work performed.

Answers to Questions about Substantial Improvement and Substantial Damage

FEMA's *Answers to Questions about Substantially Improved/Substantially Damaged Buildings* (FEMA 213) is a good resource for citizens, elected officials, members of appointed boards, contractors, and real estate and insurance professionals. Each question refers the reader to sections in the *SI/SD Desk Reference* (FEMA P-758) for more details.



FEMA 213 uses the FAQ format to:

- Explain the NFIP definitions and regulations for SI/SD
- Answer general questions about the SI/SD requirements
- Explain how local officials make SI/SD determinations
- Explain how to estimate costs and market values
- Answer common questions that arise in the post-disaster period

Terms and Definitions

Substantial Damage means damage of any origin sustained by a structure whereby the cost of restoring the building to its before-damaged condition would equal or exceed 50% of the market value of the structure before the damage occurred.

Estimating Costs of Improvements and Repairs

The costs of improvements (or the costs to repair damaged buildings to pre-damage condition) must be estimated before determining whether proposed work constitutes substantial improvement or repair of substantial damage.

- **Include** costs of all structural elements, all interior and exterior finishes, built-in appliances, all utility and service equipment
- **Include** site preparation related to the improvement or repair (e.g., foundation excavation or filling in basements)
- **Include** costs of demolition, construction management, contractor overhead and profit
- **Exclude** costs of plans and specifications, land survey, permit and inspection fees, and debris removal
- **Exclude** costs of outside improvements (landscaping, irrigation, sidewalks, driveways, fences, yard lights, pools, detached accessory structures, etc.)

Important Information

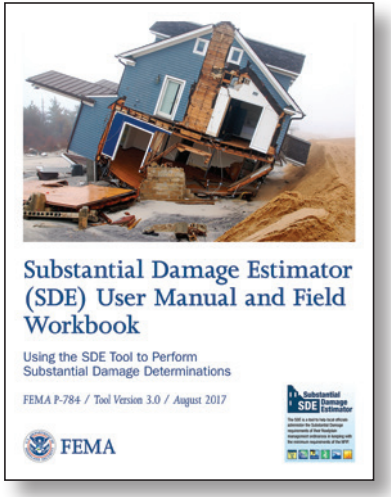
Written estimates prepared by contractors provide the best cost information.

Owners performing work must include estimates of the value of their own labor.

Equivalent costs must be estimated when materials are donated or volunteers help with construction.

For more details on cost items that must be included and those that are excluded, see the SI/SD Desk Reference (page 82).

Estimating Substantial Damage



FEMA's *Substantial Damage Estimator (SDE)* tool was developed to help state and local officials to collect uniform information needed to make substantial damage estimates when residential and non-residential structures are damaged.

The SDE tool:

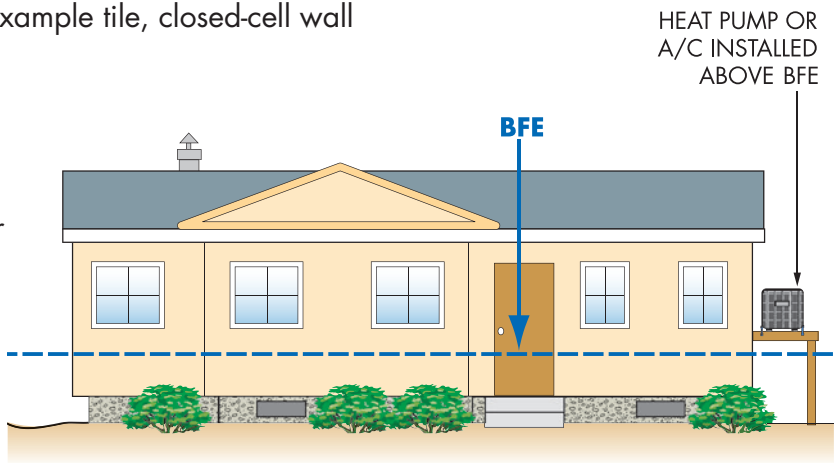
- Can be used to assess flood, wind, wildfire, seismic, and other forms of damage
- Helps provide timely substantial damage estimates so that reconstruction can begin following events that damage buildings
- Is used in conjunction with industry-accepted construction cost-estimating guides

Search online for FEMA P-784 to download the SDE software installation package, User Manual and Workbook, forms, worksheets and other materials. Worksheets can be used to manually collect information about damaged buildings, even when the software is not used.

Non-Substantial Improvement: Other than Additions

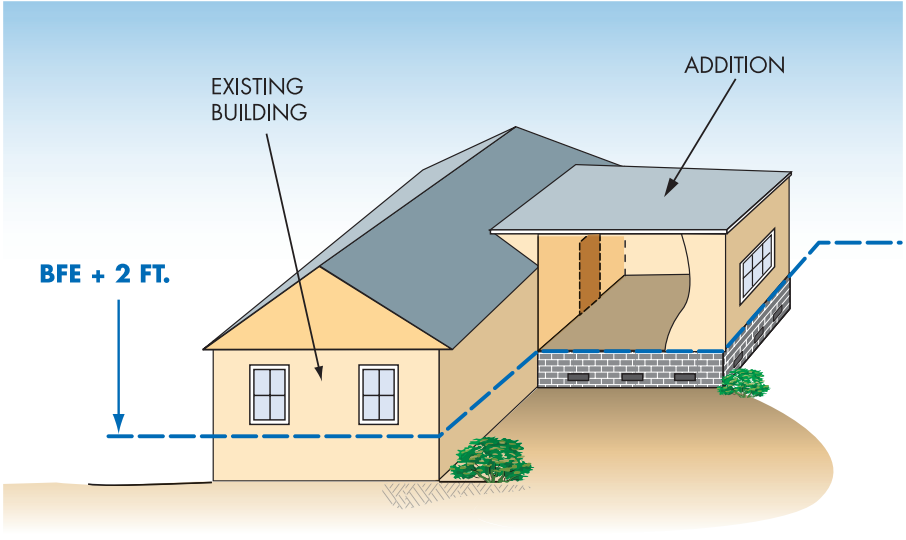
Proposed improvements are "non-substantial" if the costs are less than 50% of the market value of the building. In these cases, buildings are not required to be brought into compliance. However, there are many things owners can do to reduce exposure to future flooding. Owners should consider the following:

- 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 and must comply with the NYS Uniform Code. 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.

Non-Substantial Improvement: Lateral Additions



Important

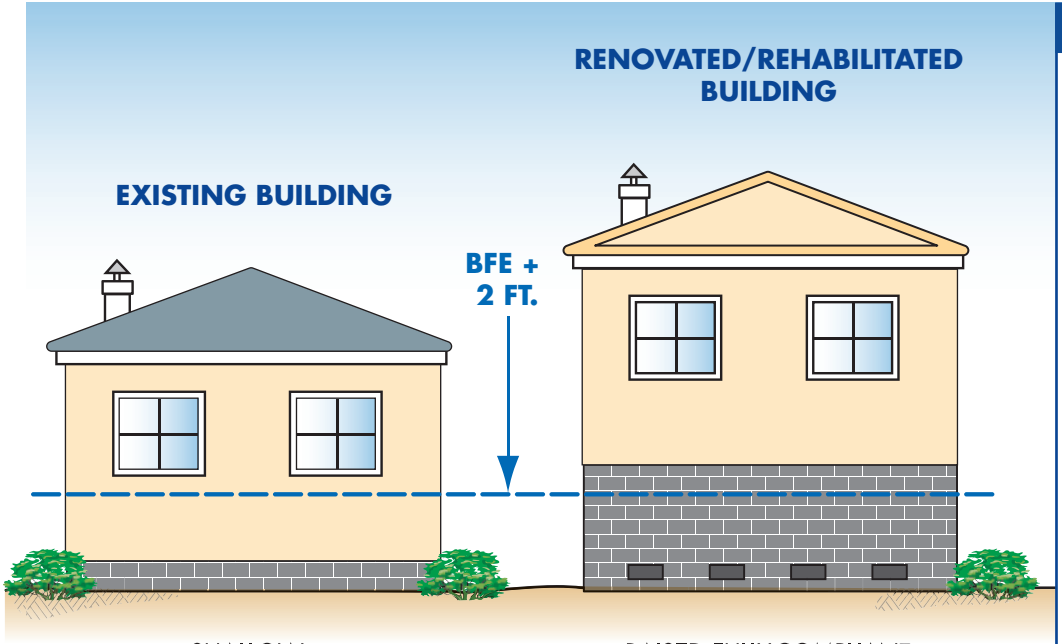
Information

Permits are required to build additions to buildings in SFHAs. Communities must determine whether proposed work will trigger the substantial improvement requirement.

See pages 90 and 91 for projects to add lateral additions that are substantial improvements.

If a project is only an addition and the addition is not substantial improvement (cost less than 50% of market value), only the addition must be elevated and comply with building code requirements.

Substantial Improvement: Alteration/Renovation Only



SHALLOW CRAWLSPACE FOUNDATION

RAISED FULLY-COMPLIANT CRAWLSPACE FOUNDATION

(SEE PAGE 89)

Important Information

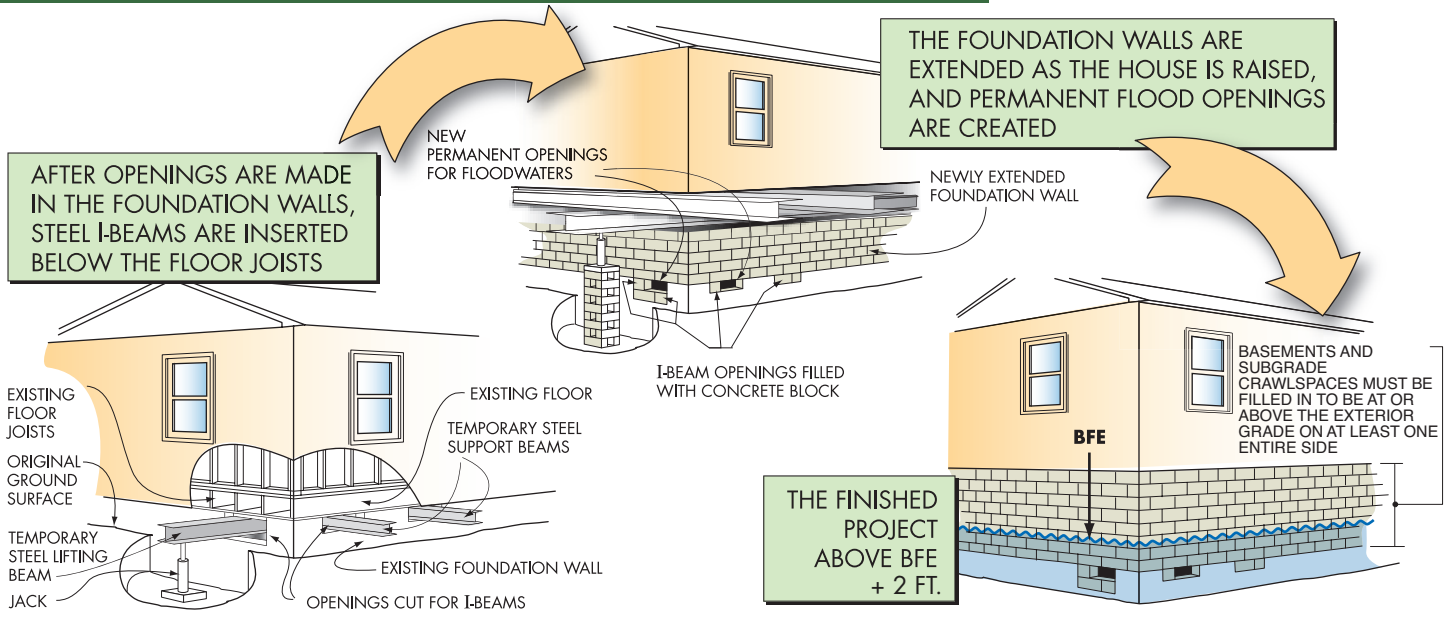
Floodplain buildings can be improved, renovated, rehabilitated or altered, but special rules apply.

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.

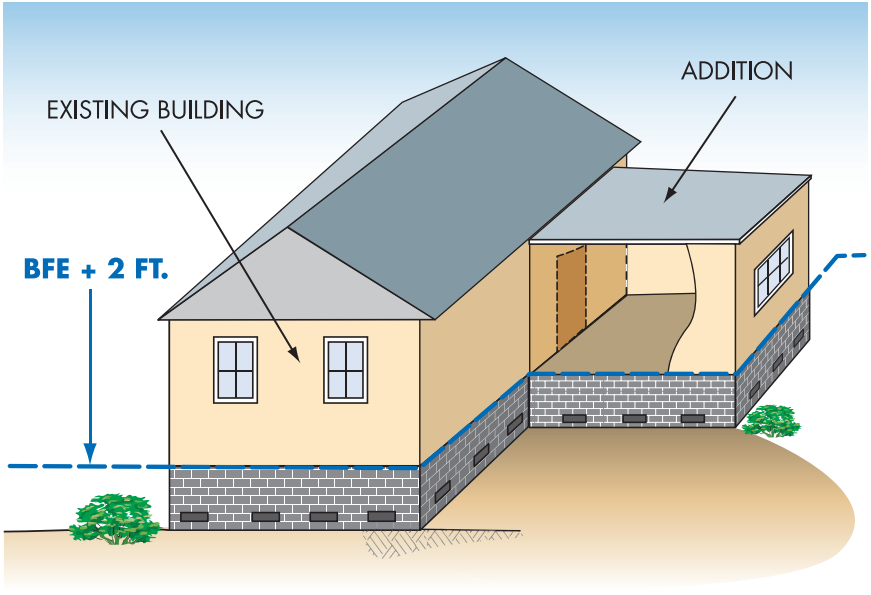
Alteration of registered historic structures are allowed, by variance, as long as the structures continue to meet the criteria for listing as historic structures.

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 95).

Substantial Improvement: Lateral Addition Only



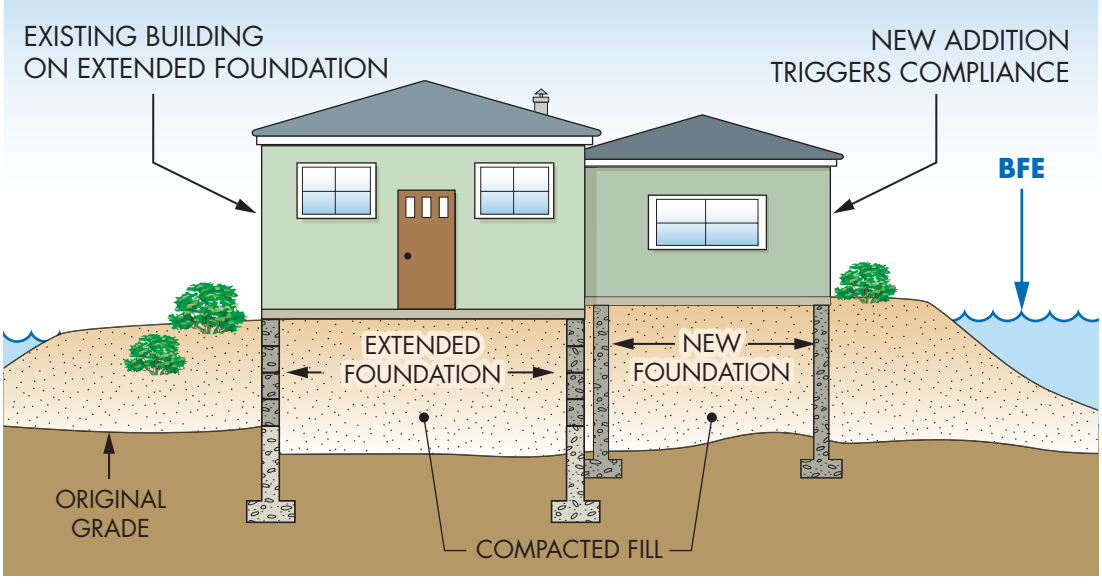
Important

Information

See page 92 for projects to add lateral additions that also modify the interior of the existing building or make structural modifications to the existing common wall.

When a local official determines a proposed lateral addition is a substantial improvement, the existing building and the addition must be brought into compliance.

Substantial Improvement: Additions

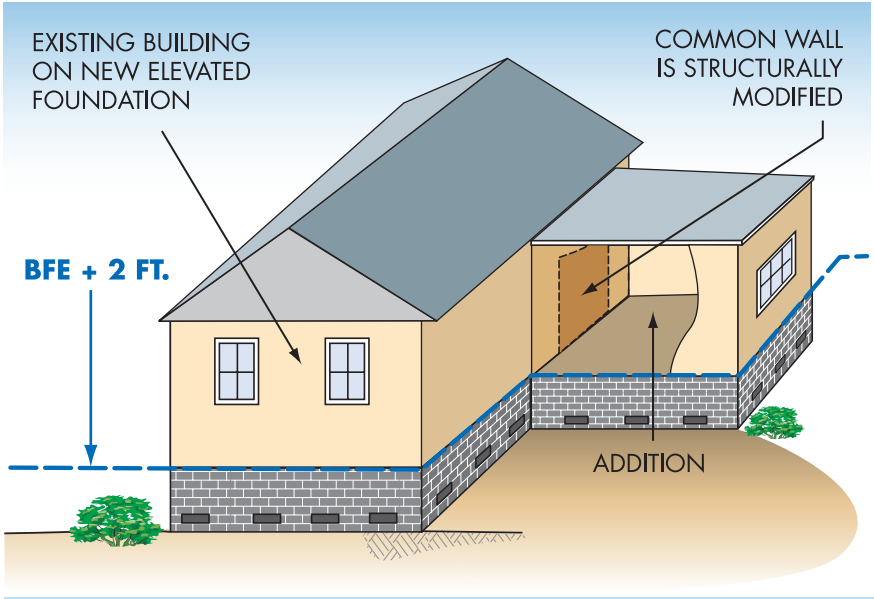


Important Information

When communities determine an addition is substantial improvement, or an addition plus other improvements are substantial improvements, the addition and the existing building must be elevated in compliance with the floodplain requirements.

Community permit offices can help determine the requirements that 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.

Substantial Improvement: Addition Plus Other Work



Communities must prepare evaluations to determine if all proposed work will trigger the substantial improvement requirement. For additions, substantial improvement is when the **cost of the addition 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.

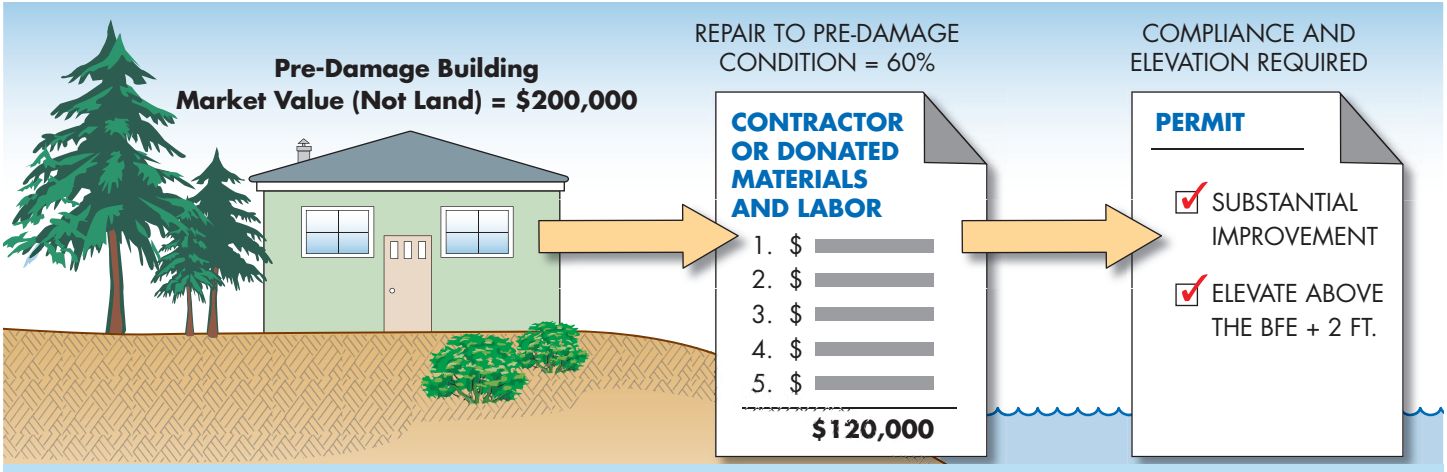
When Your Home or Business in the SFHA is Damaged

You must get a building permit from your community building department to make most repairs. Repairs must comply with requirements in the NYS Uniform Code that apply to existing buildings. When your home or business in the SFHA is damaged by any cause, your community will evaluate whether the building has been substantially damaged (see page 85).

- If your building is damaged, you should contact your community right away to learn about permit requirements. It is OK to make minimum emergency repairs to stabilize the building.
- You will need to estimate the cost to repair the building to its condition before the damage occurred.
- Especially after flood events that damage many buildings, your community may visit your property to estimate the cost of repairs.
- Your community may send you a letter based on that estimate, advising you about your next steps.

See page 83 for a link to FEMA's *Answers to Questions about Substantially Improved/ Substantially Damaged Buildings.*

Repair of Damaged Buildings



Permits are required to repair damaged buildings, regardless of the cause – fire, flood, wind, earthquake, or even vehicle impact. Detailed estimates of the cost to repair a building to pre-damage condition are required (see page 84). If the costs are 50% or more of the pre-damage market value of the building (**not land**), then it is "substantially damaged" and must be brought into compliance. Compliance usually requires raising the building and other measures. Consult with local permit offices before repairs are started.

See page 89 for an example of elevating an existing building above a crawlspace.

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 regulated flood zone
- Buildings are covered by NFIP flood insurance, which includes Increased Cost of Compliance (ICC) coverage
- Buildings have lowest floors below the BFE
- Buildings are 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 in SFHAs are substantially damaged are required to bring the buildings into compliance with flood zone requirements.

USE THE ICC CLAIM TO:

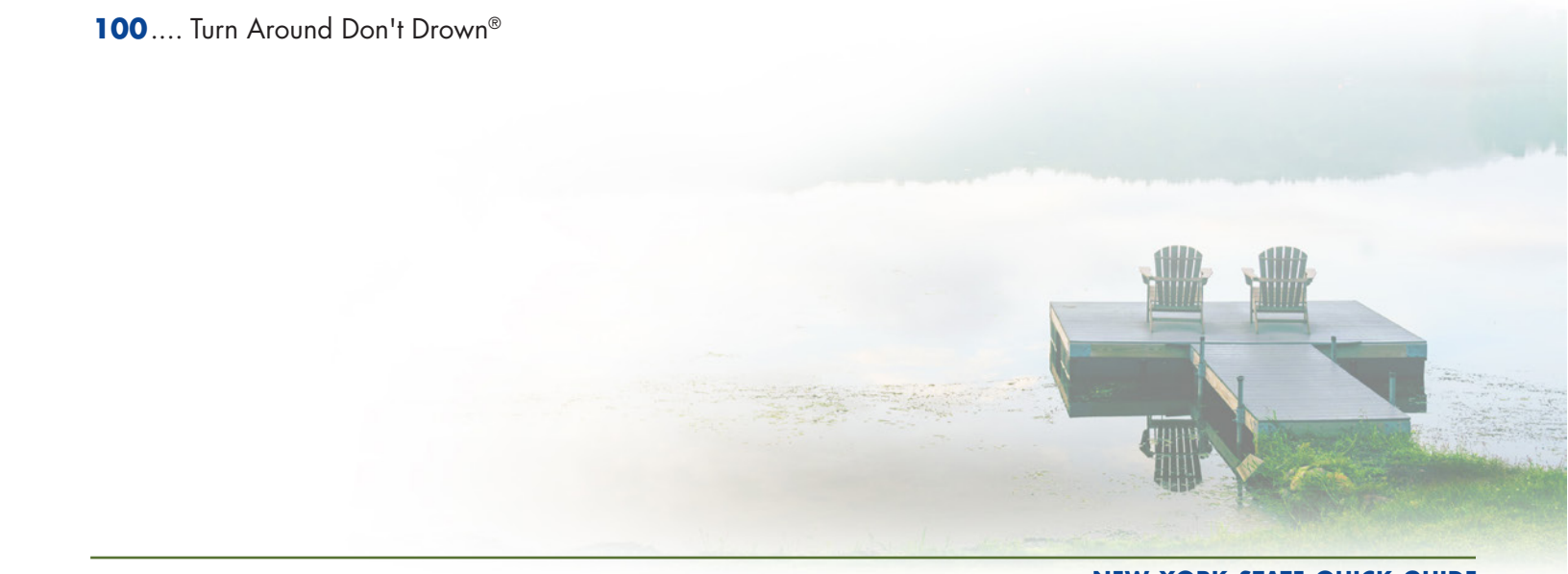
ELEVATE-IN-PLACE

RELOCATE TO HIGH GROUND

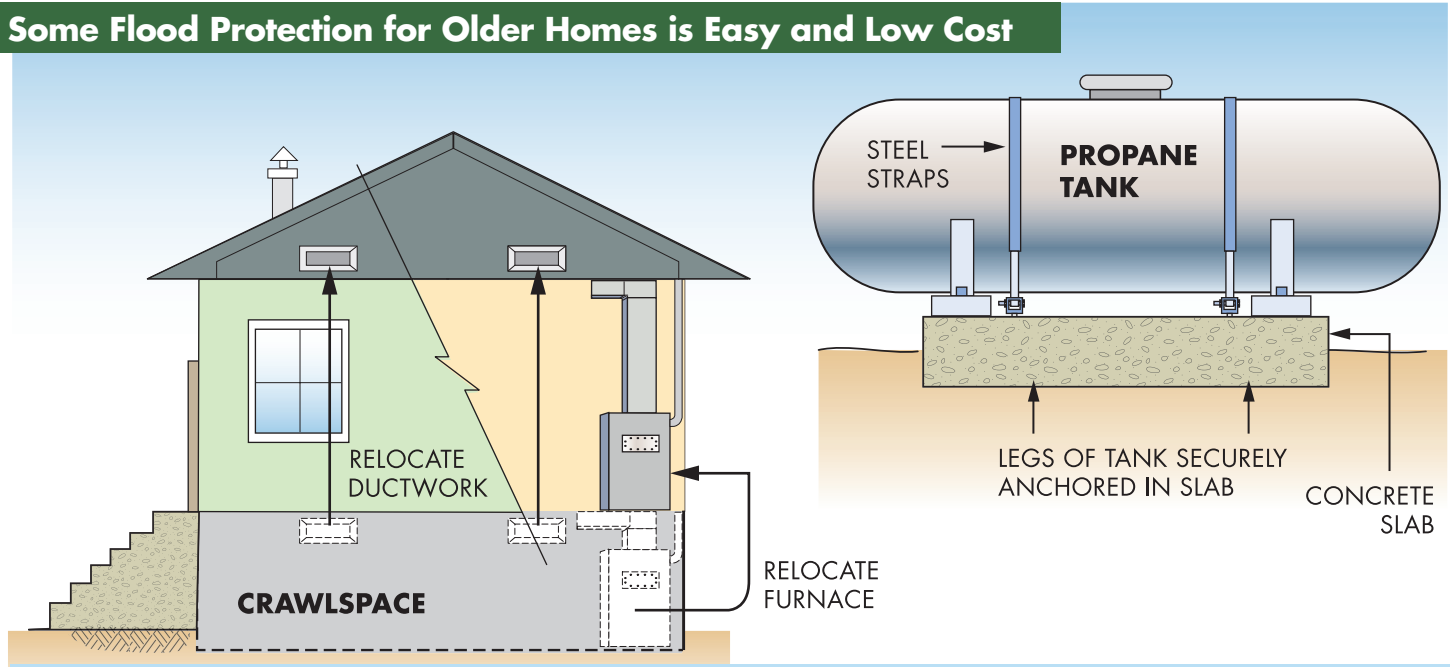
DEMOLISH

FLOODPROOF (NON-RESIDENTIAL ONLY)

FLOOD PROTECTION, MITIGATION, AND SAFETY

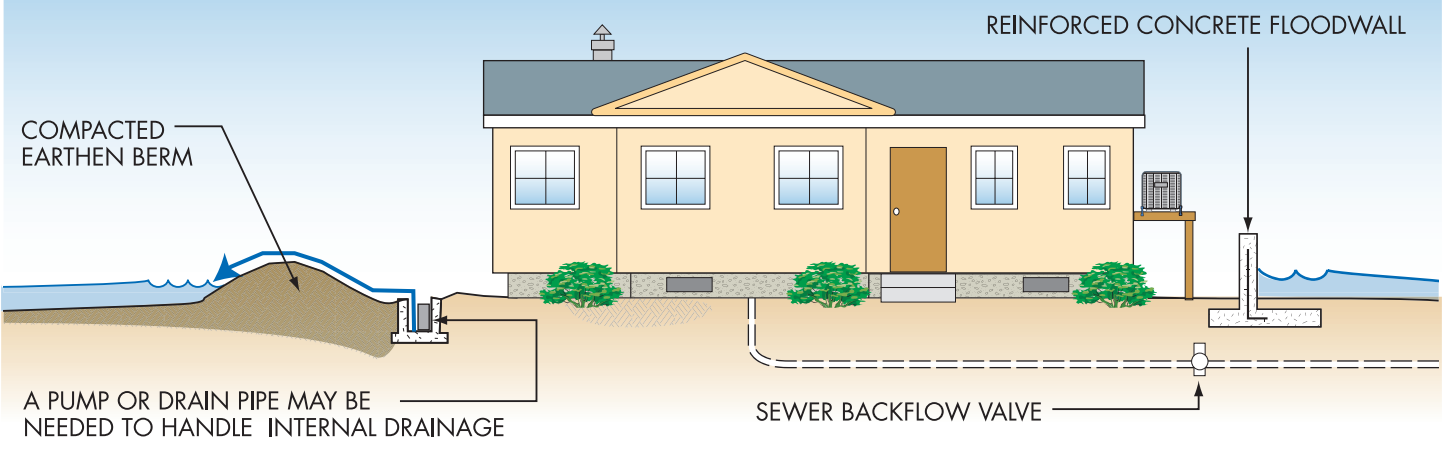


Some Flood Protection for Older Homes is Easy and Low Cost



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 flood-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 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 20). Small berms or floodwalls cannot be used to achieve compliance for new construction, substantially improved buildings, or substantially damaged buildings.

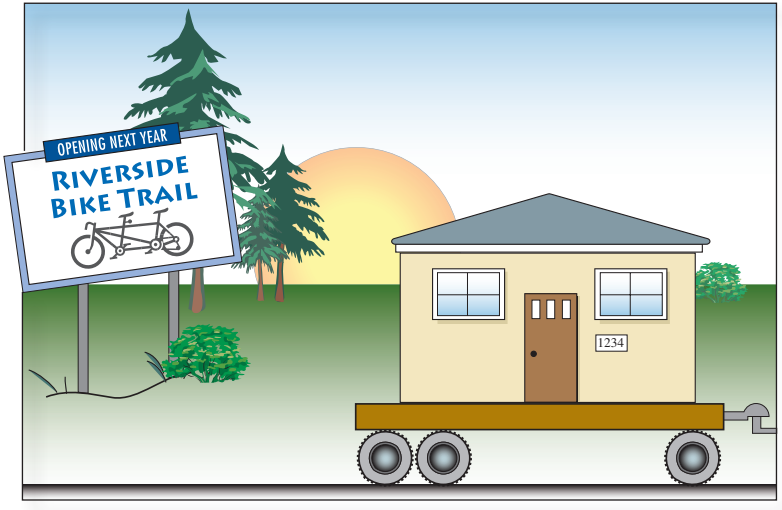
Important! These protective measures will not reduce your NFIP flood insurance premium!

Some Flood Mitigation Projects are More Costly Up Front

But Give More Protection and a Positive Return on Investment

Following floods, some communities purchase and remove damaged homes. The acquired land is dedicated to public open space or stormwater storage 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 high risk flood hazard areas. According to a National Institute of Building Sciences report on mitigation, for every one dollar spent on these types of projects, homeowners may save an average of seven dollars in future damage avoided.



The NYS Office of Emergency Management administers FEMA-funded mitigation grant programs. Communities can learn more and apply for grants at https://stormrecovery.ny.gov/hazard-mitigation-grant-program-hmgp.

The NYS Division of Homeland Security and Emergency Services administers the state-funded Hazard Mitigation Revolving Loan Fund: https://www.dhses.ny.gov/hazard-mitigation.

Be Prepared for Flood Emergencies

While governments at all levels work to reduce flood risks and respond to flood events, individuals and businesses also have responsibilities. Individuals and business owners should understand their flood risk, take action to reduce that risk, and know what to do if they are impacted by flooding. For more information about what you should know and what you can do, visit www.ready.gov/floods.

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 workers 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 (New York State communities participate in developing Hazard Mitigation Plans)
- Making family and workplace emergency plans and knowing where to go if evacuations are required
- Putting together disaster kits with supplies to last a few days

Learn more about emergency preparedness at the American Red Cross (www.redcross.org) and the NYS Division of Homeland Security and Emergency Services at https://www.dhses.ny.gov/safety-and-prevention and https://www.dhses.ny.gov/citizen-preparedness-corps.

Turn Around Don't Drown®

Learn about flood risks and follow these safety rules:

- When flooding is expected, stay away from creeks, streams, and rivers.
- NEVER drive through flooded roads – they may be washed out.
- Passenger cars may float in only 12-24 inches of water.
- Be especially cautious at night when it is harder to recognize dangers.
- Just 6 inches of fast-moving water can knock you off your feet.
- https://www.weather.gov/safety/flood-turn-around-dont-drown.

RESOURCES

Useful Resources and Common Acronyms

The New York State Department of Environmental Conservation posts information about floodplain management, floodplain staff contacts, Flood Insurance Studies and floodplain mapping, State floodplain management regulations, Frequently Asked Questions, guidance materials, and more at: https://www.dec.ny.gov/lands/24267.html.

- NFIP regulations, Title 44 CFR: www.fema.gov/flood-insurance/rules-legislation
- NFIP Technical Bulletins: www.fema.gov/emergency-managers/risk-management/building-science/national-flood-insurance-technical-bulletins
- CRS Resources: www.fema.gov/floodplain-management/community-rating-system
- New York State Floodplain and Stormwater Management Association (NYSFSMA): https://nyfloods.org

Common Acronyms

- BFE = Base Flood Elevation
- EC = Elevation Certificate
- 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, and for information about workshops and training opportunities, contact floodplain@dec.ny.gov.
- Find out about Elevation Certificates and training for professional land surveyors by searching for Elevation Certificates at www.fema.gov.
- To learn more about what actions you can take to lower your risk to flooding go to https://www.reducefloodrisk.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 NFIP flood insurance, call an insurance agent. Most insurance companies write NFIP policies.
- To learn the importance of taking steps to financially protect homes and businesses from flood damage go to www.floodsmart.gov.
- To join the New York State Floodplain and Stormwater Managers Association (NYSFSMA) and see workshop, training, and conference opportunities, go to www.nyfloods.org.

Just Flooded! Now What?

Returning home after a flood is a shock. Smart recovery won't be easy and it won't happen quickly. The NYS After-The-Flood Quick Guide walks you through recovery:

Step One – Returning Home After the Flood. Tips on clean up, debris removal, and getting help.

Step Two – Now What? Guidance on floodplain rules, permit requirements, and starting repairs.

Step Three – Make Sure It Doesn't Happen Again. How to protect your building from future flooding, who to contact, and programs to help pay for it.

The After-The-Flood Quick Guide includes advice on finding elevation contractors and companies that relocate buildings. It also illustrates options to elevate homes.

Download the guide from https://www.dec.ny.gov/lands/24267.html.

This **Quick Guide** may be downloaded from

New York State Department of Environmental Conservation

https://www.dec.ny.gov/lands/24267.html

New York State Floodplain and Stormwater Management Association

https://nyfloods.org (Resources)

NEW YORK STATE | Department of Environmental Conservation

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