Photo Source: DNR (https://geology.utah.gov/map-pub/survey-notes/geologic-hazard-map-of-st-george/)

Quick Guide

FLOODPLAIN MANAGEMENT IN UTAH

DEPARTMENT of PUBLIC SAFETY
DIVISION of EMERGENCY MANAGEMENT
UTAH

2020

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INTRODUCTION

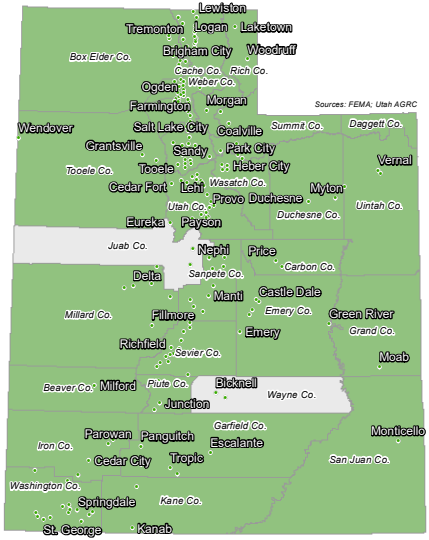
The Utah Division of Emergency Management (UDEM) is pleased to provide this floodplain management Quick Guide informational tool to citizens and community officials.

This **Quick Guide** will help you understand more about why and how communities in the State of Utah manage floodplains to protect people and property. Flood-prone communities adopt ordinances that detail the rules and requirements of developing in the floodplain. In case of conflict, that ordinance and not this publication, must be followed. If you have questions, be sure to talk to your local planning, permitting, or engineering office.

Counties and local communities regulate the floodplain to:

- **Protect** people and property
- **Reduce** future flood losses
- **Ensure** that federal flood insurance and disaster assistance is available
- **Save** tax dollars
- **Reduce** liability and law suits

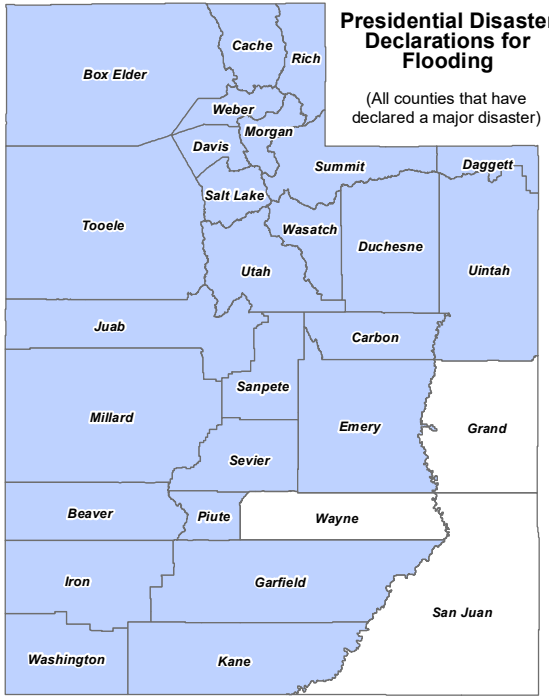
Floods have been, and continue to be, the most destructive natural disaster in terms of economic loss to the citizens of Utah. Nationwide, it is estimated that 10% of the land area is subject to flooding. Since 1978, Utah flood insurance policy holders have received over $6 million in claim payments (Utah State Hazard Mitigation Plan, 2019). Even though that represents many insurance payments, most flood-prone Utahns don't have flood insurance.



Counties and Communities Participating in NFIP

Questions and comments on the **Quick Guide** can be directed to the Floodplain Management Office of the Utah Division of Emergency Management (UDEM) at (801) 538-3400.

UTAH FLOODPLAIN FACTS



- Flood-prone areas have been identified on a FEMA FIRM, but not in all counties, cities, and towns in Utah.
- Many waterways have not been mapped, but are still subject to flooding. In fact, less than 10% of Utah's waterways are currently mapped to show flood risk. Many high-risk areas have not yet been mapped. Utah's Risk MAP Program is working to close this gap.
- Major floods are most commonly due to cloudburst thunderstorms.
- Thousands of buildings and structures are located in mapped flood-prone areas, most in the Wasatch Front region.
- Federal, state, and local governments, and private citizens paid more than $500 million to recover from Utah's flood disasters in 1983 and 1984. Two Presidential Disaster Declarations were made in 2011. Public assistance was sought for in 18 counties amounting to more than $23 million in costs. In 2017, a Presidential Disaster Declaration was made for Box Elder and Cache Counties in response to an estimated $5 million in damages caused by flooding.
- Not all flood events are declared major disasters. Many floods are local, affecting only small areas or a few watersheds.
- Flood risk changes over time due to natural or man-made conditions such as weather patterns, development, or flooding events.

FLOOD INSURANCE: A PROPERTY OWNER'S BEST PROTECTION

Photo Source: DPS (https://www.flickr.com/photos/utahnaturalhazards/)

Who needs flood insurance? **EVERYONE**! Every homeowner, business owner, and renter in any of the Utah communities that participate in the National Flood Insurance Program may purchase a flood insurance policy – **regardless** of the location of the building. Federal disaster grants do not cover most losses and repayment of a disaster loan can cost many times more than the price of a flood insurance policy.

Unfortunately, it's often after a flood that many people discover that their property insurance policies do not cover flood damages.

Approximately 25% of all flood damages occur in low-risk zones, commonly described as being "outside the mapped flood zone."

The State of Utah urges YOU to protect your financial future by getting a flood insurance policy.

Find out more about flood insurance and flood risk at ***http://floodfacts.utah.gov***.

To purchase a policy, call your insurance agent. To get the name of an agent in your community, call the NFIP's toll free number 1 (877) 336-2627 or visit ***www.floodsmart.gov***.

WHAT IS THE NATIONAL FLOOD INSURANCE PROGRAM?

The National Flood Insurance Program (NFIP) was created by Congress in 1968 to mitigate future flood losses and to provide access to federally backed flood insurance protection for property owners. The NFIP is administered by the Federal Emergency Management Agency (FEMA). Nationwide, over 22,000 communities participate in the NFIP. This includes 223 counties, cities, townships, and tribes in Utah.

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

- **Flood Hazard Maps.**
  FEMA prepares maps that are used by communities, insurance agents, and others.
- **Floodplain Management/Regulations.**
  Communities must adopt and enforce minimum floodplain management regulations so that development, including buildings, is undertaken in ways that reduce exposure to flooding (see ***page 6***).
- **Flood Insurance.**
  Property owners in participating communities are eligible to purchase federal flood insurance for buildings and contents.

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

WHY DO WE REGULATE THE FLOODPLAIN?

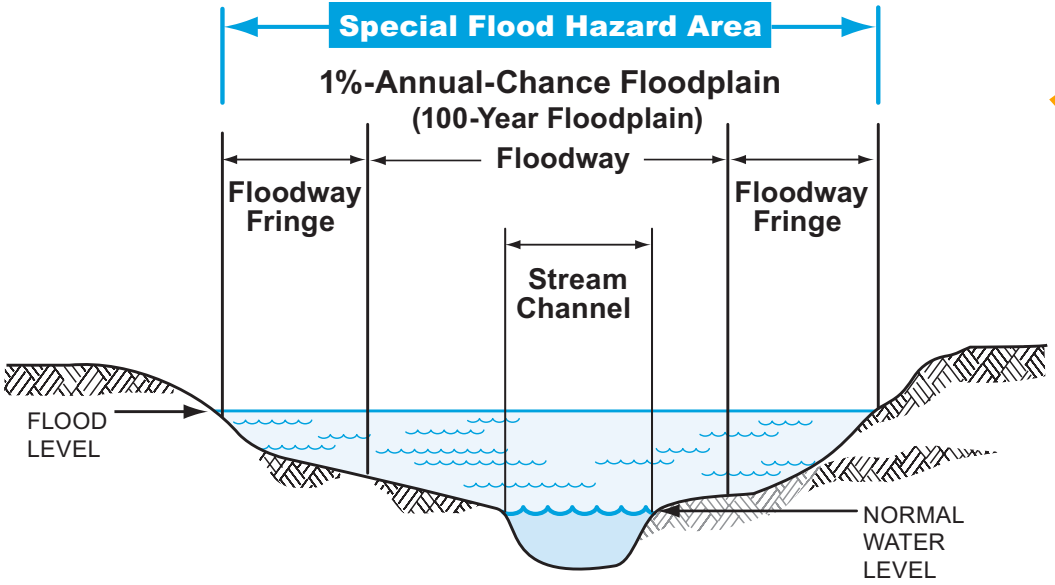
- **To protect people and property.**
  Floodplain management is about building smart and reducing our vulnerability to flooding. If we know the land will flood from time to time, we should make reasonable decisions to help protect our families, homes, and businesses.
- **To reduce future flood losses in Utah.**
  Floodplain development regulations are simply a "good neighbor" policy designed to protect our citizens from future flood losses. Regulating floodplain development helps keep flooding conditions from worsening as development continues.
- **To make sure federal flood insurance and disaster assistance is available.**
  Your community must join the NFIP before its residents can purchase federal flood insurance. Therefore, in non-participating communities, residents may be unable to secure a mortgage. In addition, your community can be ineligible for some types of federal assistance.
- **To save tax dollars.**
  Every flood disaster affects your community's budget. If we build smart, we'll have fewer problems the next time the water rises. Remember, federal disaster assistance isn't available for all floods. Even when the President declares a disaster, your community still has to pay a portion to cover the costs of evacuation, temporary housing, repair, and cleanup.
- **To avoid liability and lawsuits.**
  If we know an area is mapped as floodplain and likely to flood, if we know people could be in danger, and we know that buildings could be damaged, it makes sense to take reasonable protective steps when we develop and build in such an area.

COMMUNITY RESPONSIBILITIES

To participate in the National Flood Insurance Program and to be compliant with State floodplain management requirements, your community agrees to:

- **Adopt and enforce** a flood damage prevention ordinance
- **Require** permits for all types of development in the floodplain (see ***page 22***)
- **Assure** that building sites are reasonably safe from flooding
- **Require** new or improved homes to be elevated one foot above the Base Flood Elevation (BFE)
- **Require** non-residential buildings to be elevated or floodproofed 2 feet above the BFE
- **Conduct** field inspections and issue citations for violations of the ordinance
- **Require** Elevation Certificates to document compliance (see ***page 31*** and ***page 32***)
- **Carefully** consider requests for variances
- **Advise FEMA** when updates to flood maps are needed

UNDERSTANDING THE RIVERINE FLOODPLAIN



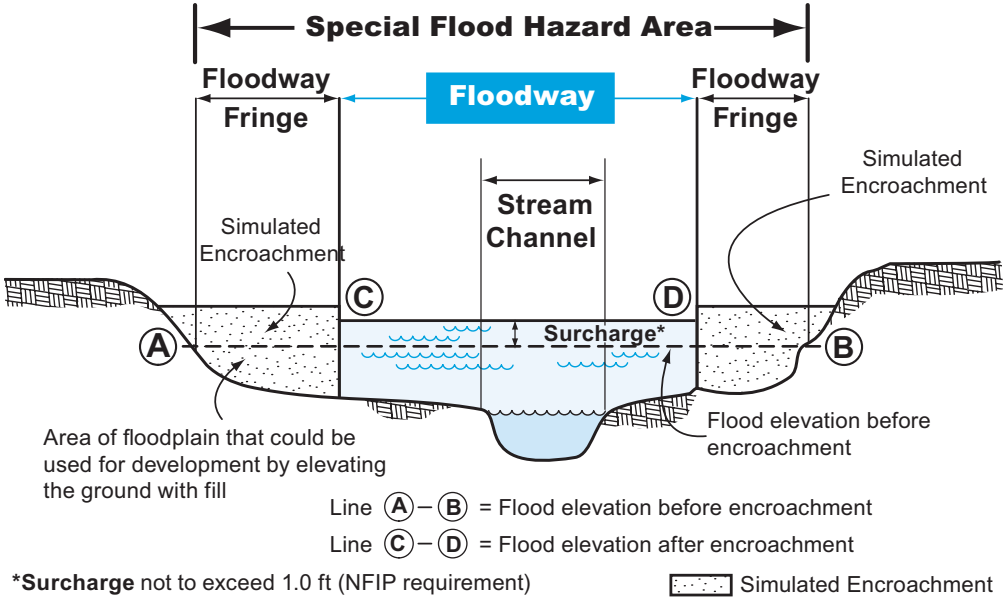
For floodplains with Base Flood Elevations, check the Flood Profiles, located in the Flood Insurance Study (FIS). These graphs show water surface elevations for a variety of return interval events (see ***page 15***).

Terms and Definitions

The **Special Flood Hazard Area (SFHA)** is that portion of the floodplain subject to inundation by the base flood and/or flood-related erosion hazards. SFHAs are shown on FIRMs in Utah as Zones A, AE, A1-A30, AH, AO, and VE.

See ***page 8*** to learn about the floodway, the area of the floodplain where floodwaters usually flow faster and deeper.

UNDERSTANDING THE 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 increasing flood depth.

Computer models of the floodplain are used to simulate "encroachment" or fill in the flood fringe in order to predict where and how much the base flood elevation would increase if the floodplain is allowed to be filled.

Before a local floodplain permit can be issued for proposed development in the floodway, the applicant must provide evidence that "no rise" (***page 35***) will occur or obtain a Conditional Letter of Map Revision (CLOMR)from FEMA. You will need a qualified engineer to make sure your proposed project will ***not*** increase flood levels.

NO ADVERSE IMPACT AND NATURAL FLOODPLAIN FUNCTIONS

"No Adverse Impact" (NAI) floodplain management is essentially a "do-no-harm" policy based on the concept that the actions of any community or property owner should not adversely affect others. It calls for identifying the potential direct and indirect adverse impacts of any development action on people, property, and the environment. Adverse impacts must be avoided or mitigated.

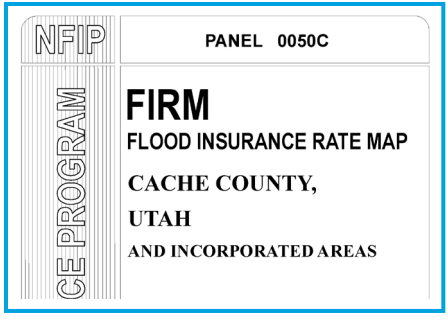
Undeveloped floodplains can serve natural and beneficial functions. They:

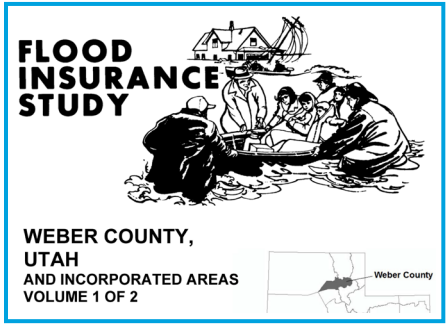
- Store floodwater and stormwater.
- Enhance water quality by filtering runoff through wetlands.
- Offer habitats for plants and animals.
- Sustain biological productivity.
- Reduce erosion and sediment runoff.
- Offer recreation opportunities.

The Association of State Floodplain Managers, Inc. developed the NAI concept in response to rising flood damages, even by communities that administer floodplain management ordinances.

At ***www.floods.org***, click on the NAI tab to download publications, the NAI Tool Kit, and PowerPoint presentations, as well as several documents about legal issues.

LOOKING FOR FLOODPLAIN INFORMATION?





View and download digital flood maps at the FEMA Map Service Center at ***www.msc.fema.gov***.

The National Flood Hazard Layer (NFHL) is a geospatial database that contains current effective flood hazard data. The NFHL can be accessed through the MSC or at ***https://www.fema.gov/national-flood-hazard-layer-nfhl***.

FEMA prepares Flood Insurance Studies and Flood Insurance Rate Maps (FIRMs) for Utah's communities.

Most FIRMs show special flood hazard areas and floodways developed by a detailed analysis while other FIRMs show floodplains delineated using only approximate analyses (see ***page 17***).

While following FEMA's quality assurance and quality control procedures, flood hazard studies may be prepared by local governments, state and federal agencies, or by engineering companies working for private property owners and developers.

Not all waterways have designated floodplains – but all waterways will flood, even though a floodplain study may not have been prepared.

Flood Maps and Flood Insurance Studies are available for viewing at your local planning or permitting office. You can also view and download flood hazard data from FEMA's Map Service Center (MSC) at ***https://msc.fema.gov***.

High-Risk Areas (Special Flood Hazard Area or SFHA)

In high-risk areas, there is at least a 1 in 4 chance of flooding during a 30-year mortgage. All home and business owners in these areas with mortgages from federally regulated or insured lenders are required to buy flood insurance. The SFHA is also referred to as the 100-year or base flood event. This area is shown on the flood maps as zones labeled with the letter "A".

Moderate-To-Low Risk Areas (Non-Special Flood Hazard Area or NSFHA)

In moderate-to-low risk areas, the risk of being flooded is reduced but not completely removed. Nationally, these areas submit over 20% of NFIP claims and receive one-third of disaster assistance for flooding. Flood insurance isn't federally required in moderate-to-low risk areas, but it is recommended for all property owners and renters. They are shown on flood maps as zones labeled with the letters "B", "C", or "X" (shaded or unshaded).

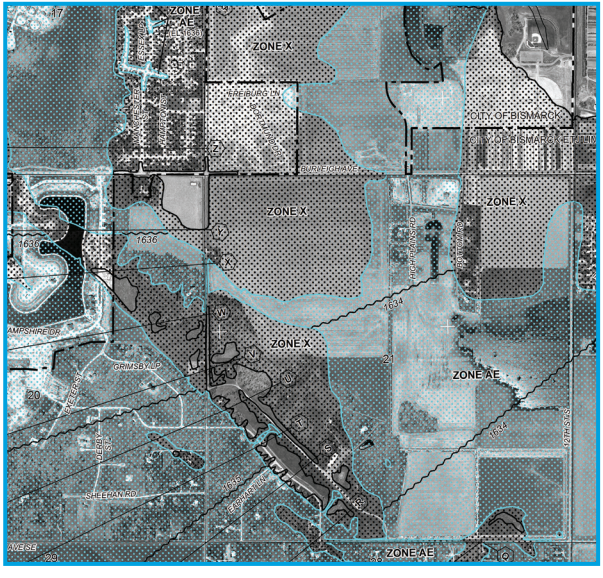
Undetermined-Risk Areas

No flood hazard analysis has been conducted in these areas, but a risk of flooding still exists. Flood insurance rates reflect the uncertainty of the flood risk. These areas are labeled with the letter "D" on the flood maps.

Photo Source: DPS (https://www.flickr.com/photos/utahnaturalhazards/)

FEMA's Flood Map Service Center

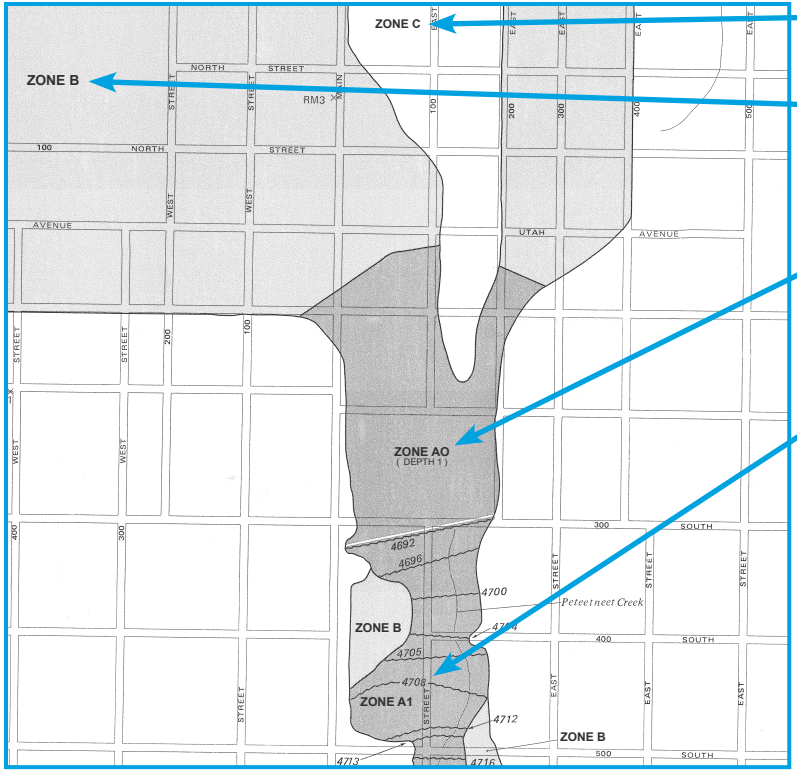
You can view FIRMs and print clips from FIRMs called FIRMettes by using FEMA's online tools on the FEMA Map Service Center website at ***www.msc.fema.gov***.



From the Map Service Center you can:

- **Enter** an address, place, or coordinates to view a FIRM at a particular location.
- **Zoom** in or out to view a specific area of a FIRM.
- **Download** official FIRM and FIS Report
- **Create** a FIRMette showing a specific area of a FIRM, the FIRM Title Block, north arrow, and FIRM approximate scale.
- **Print** the FIRMette.
- **Save** the FIRMette as an Adobe PDF or an image file.
- You can also download other flood risk products for a community, including historic products, map revisons, and NFHL data for the county in GIS format.

PAPER FORMAT FLOOD INSURANCE RATE MAP



Zone C (or Zone X) is all areas considered to be low risk.

Zone B (or shaded Zone X) is subject to flooding by the 0.2%-annual-chance (500-year) flood, and is a moderate risk area.

Zone A, Zones A1-A30 and Zone AE are subject to flooding by the base or 1%-annual-chance (100-year) flood, and are considered high risk areas.

Base Flood Elevation (BFE) is the water surface elevation, rounded to the nearest foot, of the 1%-annual-chance flood event at specific locations.

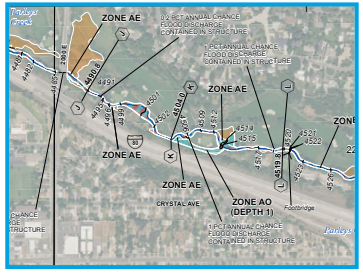
FEMA prepares Flood Insurance Rate Maps (FIRMs) to show areas that are at high risk of flooding due to storm or snow melt. Most FIRMs show the flood elevation (how high the water may rise), called the Base Flood Elevation (BFE).

OTHER FIRM FORMATS (DFIRM AND NEW RISK MAP)

FEMA, in cooperation with state, local, and business partners is producing countywide Digital Flood Insurance Rate Maps (DFIRMs) through the Risk Mapping, Assessment, and Planning (Risk MAP) program.

DFIRMs are in an industry-standard Geographic Information System (GIS) format, that allows users to view information in a graphical format and add or remove layers of data according to their needs.

The flood risk zones, street names, jurisdictional boundaries, and other data can be overlaid on aerial photographs. The new map format enables more efficient and accurate flood risk determinations.



Zone A is the 1%-annual-chance (100-year) floodplain with no BFEs.

Zone AE is the 1%-annual-chance (100-year) floodplain with BFEs (also called Zone A1-A30).

Zone AH is the area inundated by the 1%-annual-chance flood event (usually an area of ponding) with flood depths from 1 to 3 feet.

Zone AO is the area inundated by the 1%-annual-chance flood event (usually sheet flow on sloped terrain) with flood depths from 1 to 3 feet.

Zone VE is the 1%-annual-chance (100-year) floodplain with additional hazards associated with storm-induced waves. BFEs determined from detailed hydraulic analysis are shown.

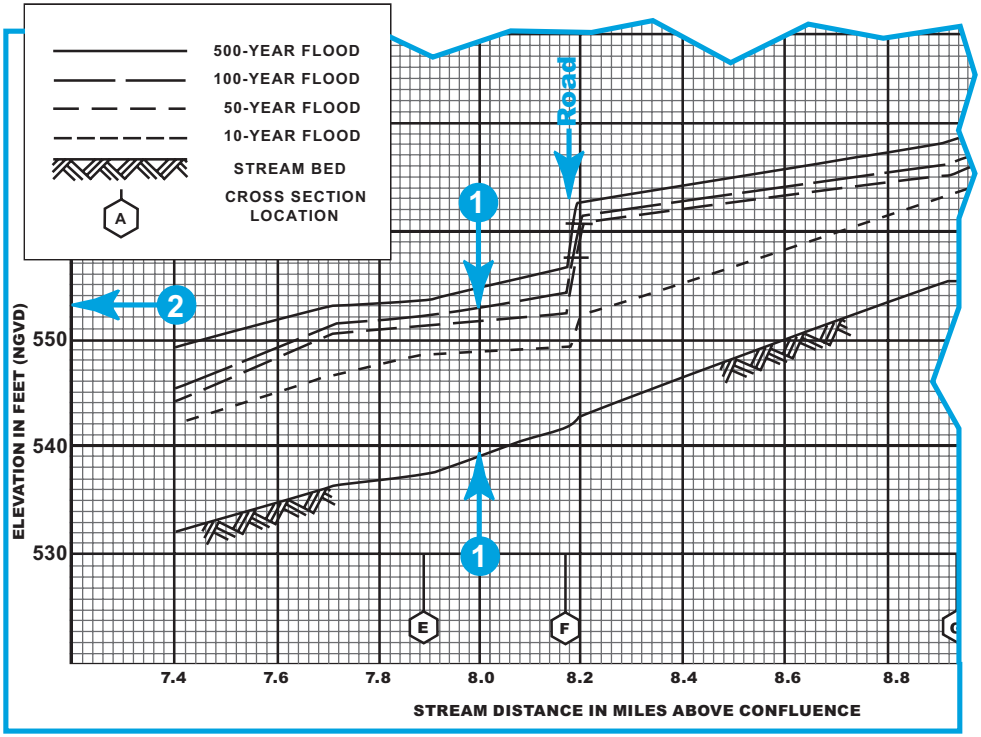
Zone X (shaded or unshaded) is all other areas considered moderate-to-low risk (formerly Zone B or C).

Base Flood Elevation (BFE) is the water surface elevation, rounded to the nearest foot, of the 1%-annual-chance flood event at specific locations.

The **Floodway** is the cross-hatched area.

Cross Section location is indicated by a lettered label. Associated elevations can be found in the Flood Insurance Study.

USING THE STREAM FLOOD PROFILE TO DETERMINE BFE



The Flood Insurance Study (FIS) includes flood profiles that 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.

1. On the Flood Insurance Rate Map, locate your site by measuring the distance along the centerline of the stream channel from a cross section, for example E or F.

2. Scale that distance on the flood profile and read up to the profile of interest, then across to determine the elevation.

In this example, at 8 miles above the confluence, the BFE is 553 feet.

FLOODWAY DATA TABLES

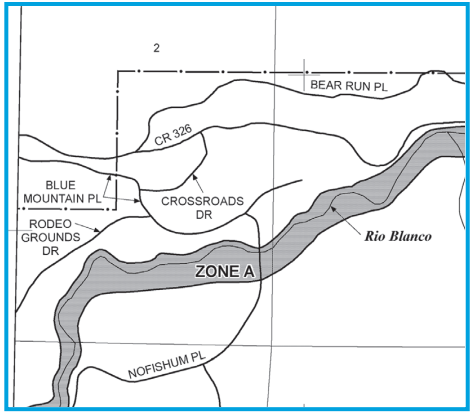
The Floodway designates a portion of the SFHA that must be reserved to convey the base flood without increasing the water surface elevation more than the amount specified in the Floodway Table.

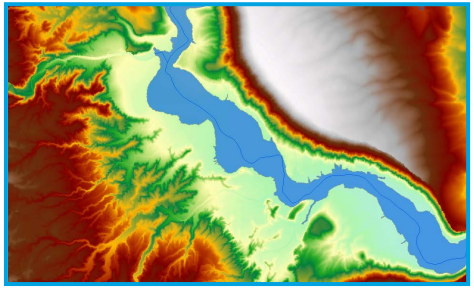
The Flood Insurance Study (FIS) has a Floodway Table for every waterway that was studied by detailed methods for which floodways were delineated.

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER-SURFACE-ELEVATION (FEET NAVD)			
CROSS-SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Dry Creek								
A	0	162	321	3.7	4,560.4	4,560.4	4,561.4	1.0
B	420	129	319	3.4	4,563.2	4,563.2	4,564.2	1.0
C	850	139	296	4.8	4,566.2	4,566.2	4,567.2	1.0
D	1,050	218	490	2.7	4,567.0	4,567.0	4,567.2	0.2
E	1,275	195	332	4.1	4,568.3	4,568.3	4,569.1	0.8
F	1,440	134	292	4.7	4,569.6	4,569.6	4,570.6	1.0
G	1,885	216	372	2.9	4,571.6	4,571.6	4,572.5	0.9
H	2,050	167	316	3.5	4,572.8	4,572.8	4,573.7	0.9
I	2,425	170	339	3.7	4,575.7	4,575.7	4,576.6	0.9
J	2,625	102	209	6.2	4,578.0	4,578.0	4,578.9	0.9
K	2,845	183	371	3.5	4,580.3	4,580.3	4,581.3	1.0
L	3,040	210	555	1	2	4,581.3	4,582.1	3
M	3,090	232	660			4,581.3	4,582.2	

1. This is the only readily available velocity data to use in computation of hydrodynamic loads.
2. Computed BFE (rounded values are shown on the FIRM).
3. Amount of allowable increase – not more than 1 foot for older studies and 0.5 foot for new studies at any location.

APPROXIMATE ZONE A AND BASE LEVEL ENGINEERING





Approximate A Zones are drawn based on existing information and approximation methods, not detailed engineering analyses. Sometimes new flood studies are required in order to delineate the floodplain and determine the BFE. Other sources of floodplain information include the Utah Geological Survey, U.S. Army Corps of Engineers, the U.S. Geological Survey, and the Utah Department of Transportation.

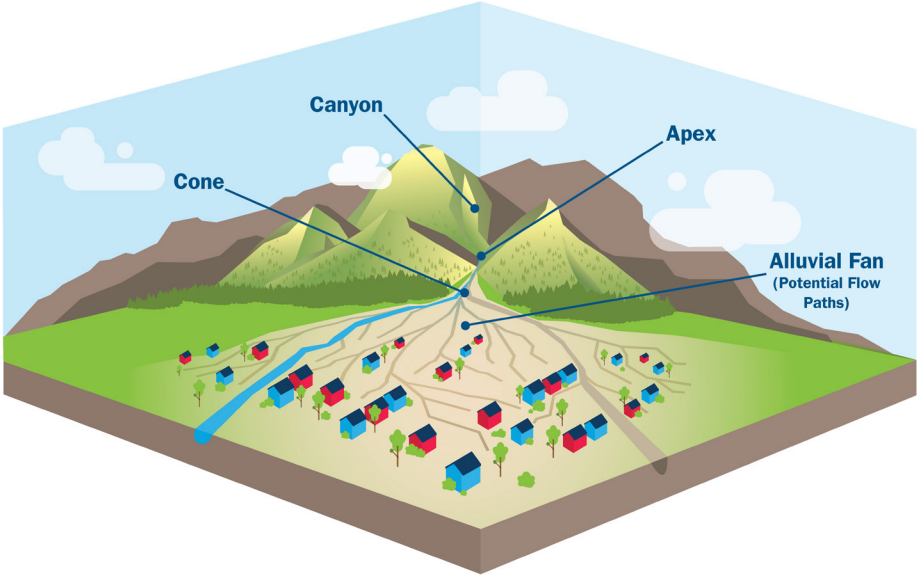
As of 2014, FEMA now requires all A zones to have model-backed engineering data.

Base Level Engineering (BLE) combines high-resolution ground elevation data, and modeling technology advancements to create engineering models and flood hazard data for large-scale areas like a watershed. The BLE approach produces flood elevations along each stream studied.

BLE information is used to assist local communities to estimate BFEs in Zone A areas. If the stream has been studied by more detailed methods (Zone AE) then the current effective FIRMs and stream profiles in the FIS should be used to determine the BFE.

If you need help in determining the BFE, check with your community permit office. FEMA publication Managing Floodplain Development in Approximate Zone A Areas (FEMA 265) is useful for engineers and surveyors.

ALLUVIAL FANS



An alluvial fan is an area where silt, sand, gravel, boulders, and woody debris are deposited by rivers and streams over a long period of time. They are found on the slopes between the mountain front and the valley bottom.

Flood Hazards associated with alluvial fans include:

- Braided, unpredictable flow paths
- High-velocity flows
- Erosion and scour
- Sediment transport and deposition
- Debris flow
- Mud flow
- Flash flooding
- Sheet flow

Floodplains associated with alluvial fans are identified on the FIRM as ***Zone AO*** with a flood depth and velocity. LOMAs and LOMR-Fs (see ***page 20***) are not allowed for properties located in the alluvial fan.

CAPTURING FLOODPLAIN CHANGES

The cornerstone of reliable floodplain management is good floodplain mapping.

If the current map shows only approximate flood information, and you want to develop the land, your community may require you to provide new floodplain information. If development proposals involve more than 5 acres or 50 lots, then federal regulations require permit applicants to provide detailed information.

New engineering studies typically are required for some projects that involve changing the floodplain, for example placing large quantities of fill or altering a waterway.

Development in the regulatory floodway comes with additional requirements. Before a permit may be issued, the community responsible for permitting such use shall notify the State Engineer and seek his/her approval. Additional technical data, including a functioning hydraulic model may be needed.

Contact your local Floodplain Administrator for advice on flood information and permits. Reference the Utah State Building Code, Title 15 and the Code of Federal Regulations, Title 44, for additional guidance.

Photo Source: DPS (https://www.flickr.com/photos/utahnaturalhazards/)

FLOOD MAP REVISIONS - LETTERS OF MAP CHANGE

1. **Letter of Map Amendment (LOMA)** is an official change to an effective FIRM that may be issued when a property owner provides additional technical information, such as ground elevation relative to the BFE, SFHA, and the structure. Lenders may waive the flood insurance requirement if the LOMA documents a structure on ground above the base flood elevation.
2. **Letter of Map Revision (LOMR)** is an official change to an effective FIRM that may be issued to change flood insurance risk zones, floodplain, boundary delineations, BFEs, and/or other map features. Lenders may waive the flood insurance requirement if the approved map revision shows the structures to be outside of the SFHA.
3. **Letter of Map Revision Based on Fill (LOMR-F)** is an official change to an effective FIRM that is issued to document FEMA's determination that a structure or parcel of land has been elevated above the BFE by the placement of fill, and therefore is no longer in the SFHA. Lenders may waive the flood insurance requirement if the LOMR-F shows a structure on fill is above the BFE and outside of the SFHA. Areas removed from the floodplain by a LOMR-F are subject to development regulations.
4. **Physical Map Revision (LOMR-PMR)** may be issued for major physical floodplain changes that require engineering analyses, such as bridges, culverts, channel changes, flood control measures, and large fills that change the BFE or Floodway. PMRs are also issued when a new study updates or improves the FIRM.

Requests for map revisions must be endorsed by the local community.

Important Information

Check FEMA's Flood Hazard Mapping website for more information about map revisions.

To learn the status of Map Change Requests, call FEMA's **Map Service Center:** 1-877-FEMA-MAP (1-877-336-2627).

Information:
http://www.fema.gov/status-map-change-requests

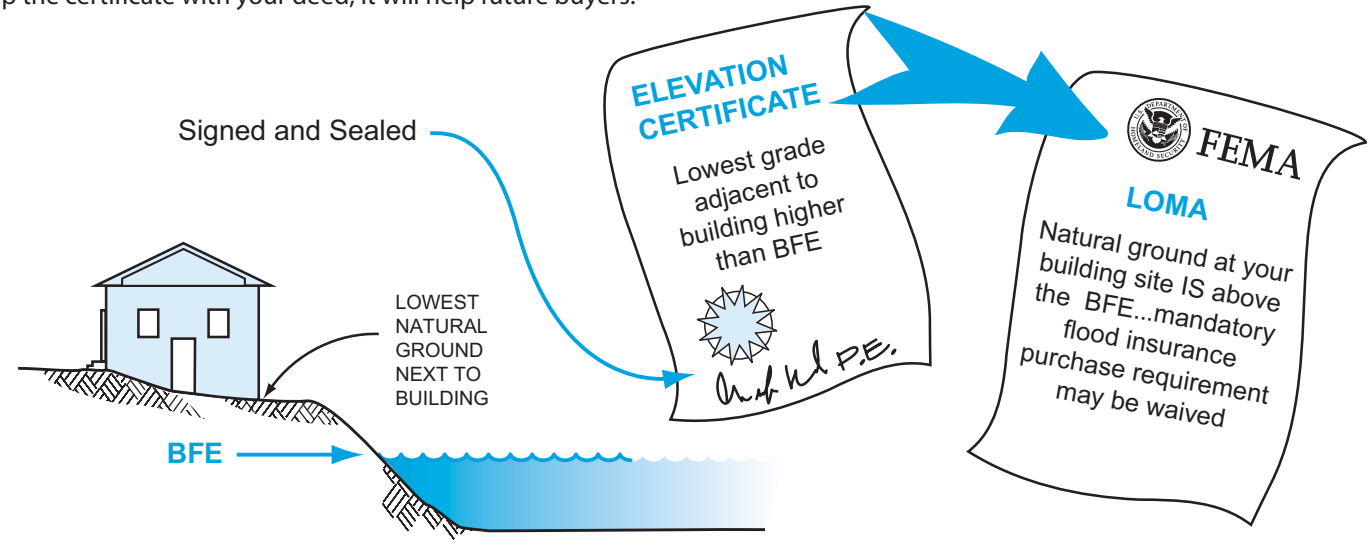
Forms:
https://www.fema.gov/forms-documents-and-software

IS YOUR BUILDING SITE HIGHER THAN THE BFE?

If your land is shown to be within Zone A on the FIRM, but your building site is higher than the Base Flood Elevation (BFE)… get a surveyor or engineer to complete a FEMA Elevation Certificate (EC). Submit the EC with an application to FEMA and a Letter of Map Amendment may be issued (***page 20***).

This is the **ONLY** way to remove the requirement to buy flood insurance.

Keep the certificate with your deed, it will help future buyers.



DEVELOPMENT ACTIVITIES REQUIRING FLOODPLAIN PERMITS

Development is defined as any man-made change to improved or unimproved real estate. Some examples are:

- Constructing new buildings
- Additions to existing buildings
- Substantially improving existing buildings
- Placing manufactured (mobile) homes
- Subdivision of land
- Temporary buildings and accessory structures
- Agricultural buildings
- Parking or storage of recreational vehicles
- Storing materials, including gas/liquid tanks
- Roads, bridges, and culverts
- Fill, grading, excavation, mining, and dredging
- Altering stream channels

A floodplain permit is separate from a building permit, and is required for **ALL** development that occurs within the SFHA.

SOME KEY PERMIT REVIEW STEPS

The Permit Reviewer has to check many things before the permit is issued.

Some of the key questions are:

- Is the site in the mapped floodplain?
- Is the site in the mapped floodway?
- Have other state and federal permits been obtained?
- Does the site plan show the Base Flood Elevation?
- Is substantial improvement of an older building proposed?
- Is an addition proposed?
- Will new buildings and utilities be elevated properly?
- Will manufactured homes be properly elevated and anchored?
- Do the plans show an appropriate and safe foundation?
- Has the owner submitted an Elevation Certificate?

CAREFULLY COMPLETE THE PERMIT APPLICATION

Part of a Sample Application
(may vary by community)

Owner's Name:
DAVID & SALLY JONES

Site Address, Tax #, Parcel #:
781 REED STREET, 400-55A-002

A. Description of Work

1. Proposed Development Description:

- ☑ New Construction
- ☐ Alteration or Repair
- ☑ Filling
- ☐ Grading
- ☐ Dredging
- ☐ Manufactured/Modular
- ☐ Logging
- ☐ Other

2. Size and Location of Development

SINGLE FAMILY (2,000 CY FILL);
FLOOD FRINGE OF OAK CREEK

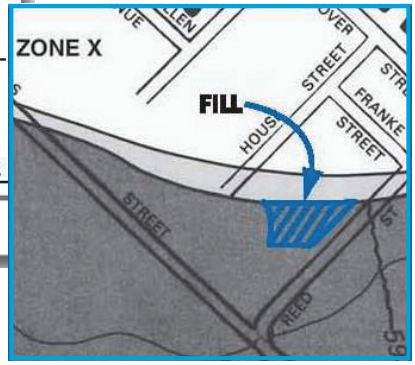
3. Type of Construction

- ☑ New Residential
- ☐ New Non-Residential
- ☐ Addition
- ☐ Improvement
- ☐ Renovation
- ☑ Accessory structure
- ☐ Temporary

Community, Map, and Elevation Data:

1. Community No: 570171
2. Panel No: 57205C1270DJ
3. Zone AE
4. Base Flood Elevation 59.2
5. Required Lowest Floor Elevation (including basement) 60.2
6. If floodproofed, required floodproofing elevation N/A
7. Elevation to which all attendant utilities, including all heating, duct work, and electrical equipment will be installed or floodproofed: 60.2

Applicant's Signature: David M. Jones



Important Information

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

Good information will lead to better construction and less exposure to future flood damage.

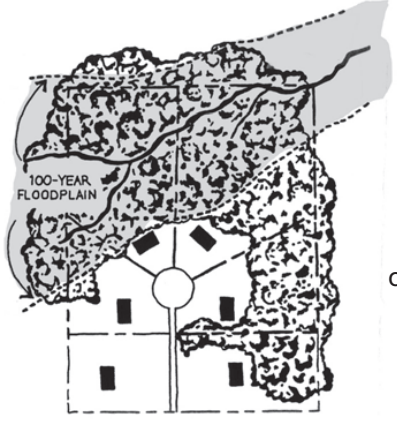
SAFE USES OF THE FLOODPLAIN

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

NOT RECOMMENDED

All land subdivided into lots, some lots partially in the floodplain with setbacks to keep home sites on high ground.

RECOMMENDED

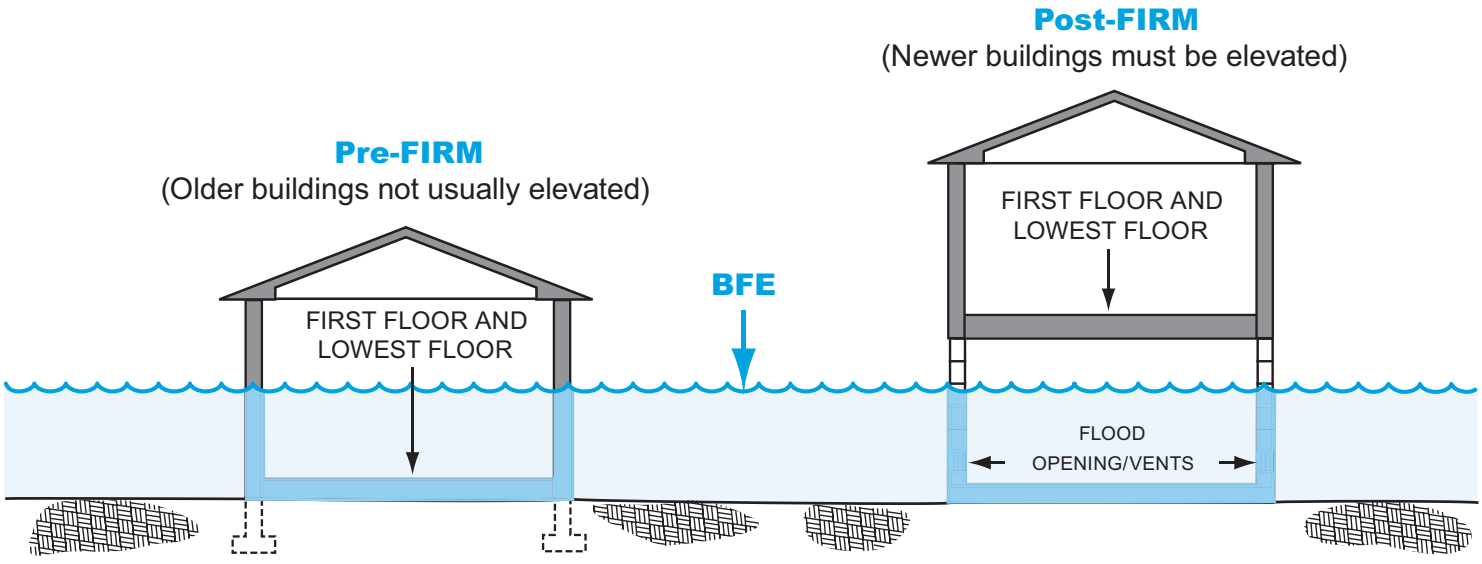


Floodplain land put into public/common open space, net density remains, lot sizes reduced, and setbacks modified to keep home sites on high ground.

RECOMMENDED

Let the floodplain do its job – if possible, keep it natural, open space. Other low damage uses include: recreational areas, playgrounds, reforestation, parking, gardens, pasture, accessory structures, or created wetlands.

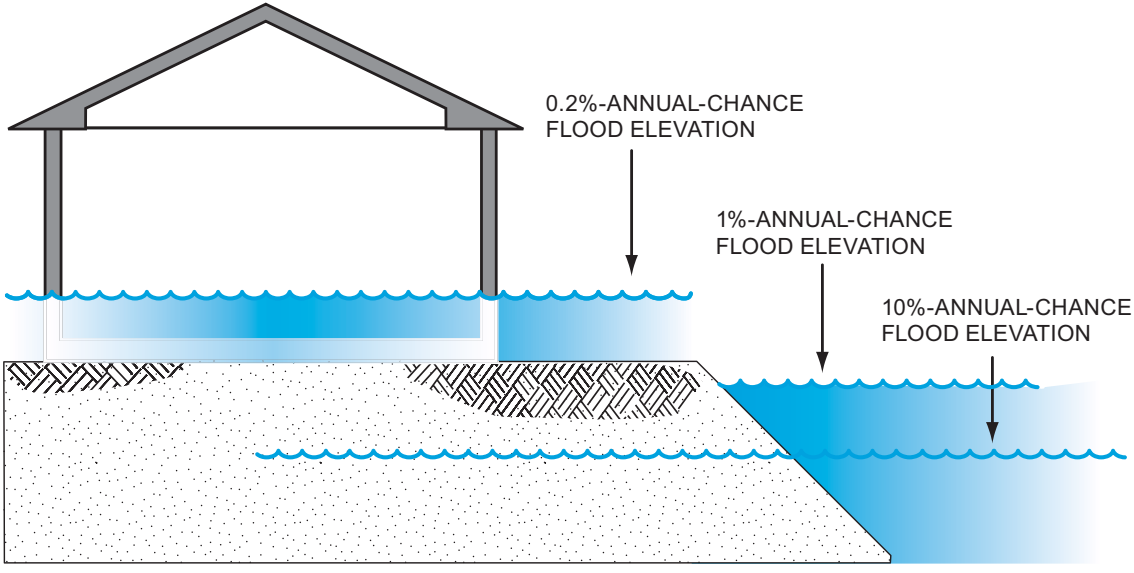
WHAT IS MEANT BY PRE-FIRM AND POST-FIRM?



A building is Pre-FIRM if it was built before the date of your community's first FIRM.

If built after that date, a building is Post-FIRM. Find the initial FIRM date online at ***www.fema.gov/cis/UT.html*** or call your community's planning, engineering or permitting office. Improvements or repairs to Pre-FIRM buildings may require permits (see ***page 22***).

NATURE DOESN'T READ MAPS



Important Information

Flash floods are the #1 weather-related killer in the U.S., since they can roll boulders, tear out trees, and destroy buildings and bridges. A flash flood is a rapid flooding of low-lying areas in less than six hours, which is caused by intense rainfall from a thunderstorm. Flash floods can also occur from the collapse of a man-made structure or ice jam.

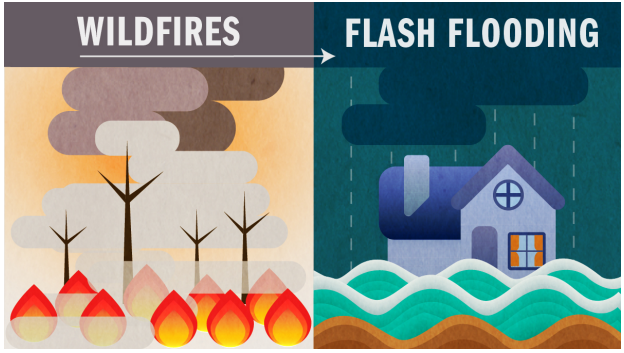
CAUTION! Nature doesn't read flood maps! Major storms, snow melt, and flash floods can cause flooding that rises higher than the 1%-annual-chance or BFE. Protect your home or business by elevating higher than the minimum standard. See ***page 30*** to see how this will save you money on insurance.

FLOOD AFTER FIRE

Even if your structure wasn't directly impacted by a wildfire, you are at an increased risk for flooding for several years. Most property insurance does not cover flooding.

- During normal conditions, vegetation and soil help absorb rainwater. After a wildfire, burned vegetation and charred soil form a water repellent layer.
- During the next rainfall, water bounces off the soil and properties downstream of the burn areas are at an increased risk for flooding.

Green Ravine Fire, 2019 (Tooele County)
Source: utahfireinfo.gov



- Intense rainfall can flood low lying areas in less than six hours. Flash floods roll boulders, tear out trees, and destroy buildings and bridges.
- Rivers of liquid and flowing mud are caused by a combination of brush loss and subsequent heavy rains. Rapid snowmelt can also trigger mudflows.
- The Flood Insurance Rate Map depicts areas of flood risk. It does not account for increased risk after a wildfire when runoff and debris and flooding may occur in areas not identified on the FIRM as high-risk.
- The NFIP estimates that 1 inch of water can cause up to $25,000 in damage.
- The best way to protect your property from flooding after fire is to purchase flood insurance.
- Normally new policies for flood insurance become effective following a 30-day waiting period. However, the Biggert-Waters Flood Insurance Reform Act of 2012 provides some exceptions to this requirement related to flooding caused by post-wildfire conditions.

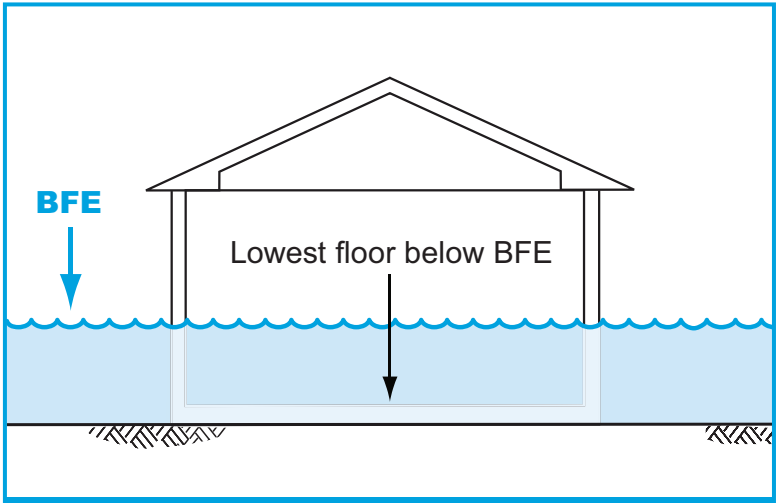
THINK CAREFULLY BEFORE YOU SEEK A VARIANCE

Very specific conditions must be satisfied to justify a variance:

- Good and sufficient cause
- Unique site conditions
- Individual non-economic hardship
- No increase in flood level if in the floodway

A variance that allows construction below the BFE does not waive your lender's flood insurance requirement. Flood insurance will be very expensive – perhaps more than $5,000 per year (see ***page 30***)!

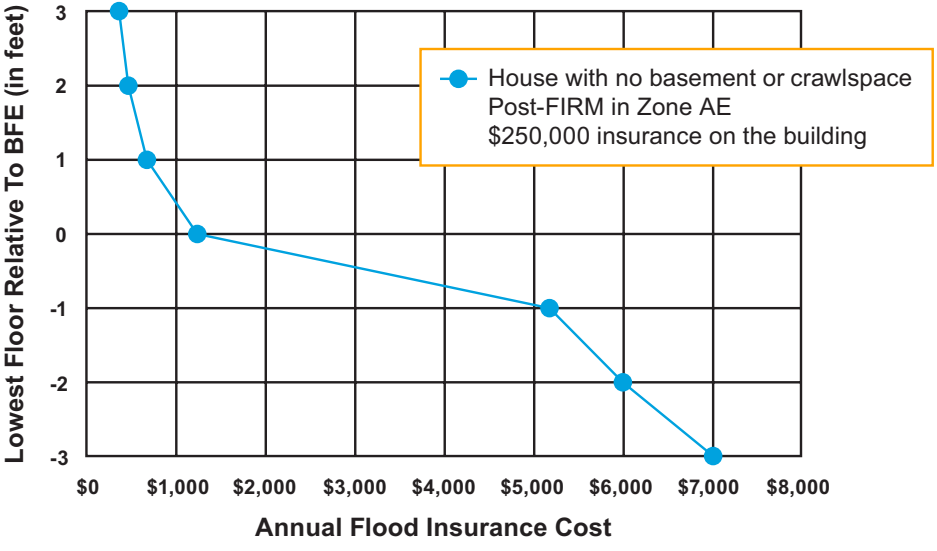
Think carefully about seeking a variance to build below the Base Flood Elevation. Not only will your property be more likely to get damaged, but insurance will be very costly. If your community has a pattern of inconsistent variances, sanctions can be imposed – costing you even more!



Post-FIRM building, not elevated

Insurance $5,000 +/year

FREEBOARD: GO THE EXTRA FOOT



Want to save some money and have peace of mind at the same time? Then add freeboard to build higher than the minimum elevation requirement! Freeboard is a factor of safety, usually one or two feet above the BFE.

In Utah, one foot of freeboard is required for residential and non-residential structures while critical facilities have a higher standard.

Important

Information

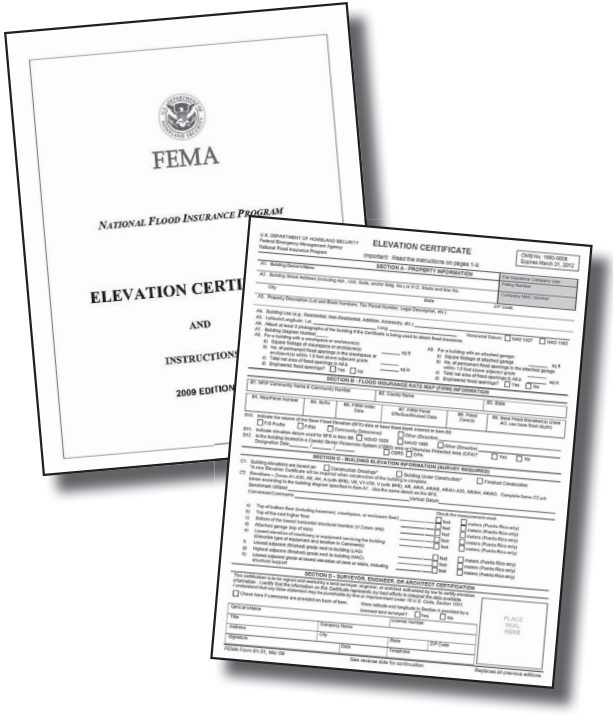
Flood insurance rates and various fees change from time to time. Rather than specific costs for insurance, this figures gives a feel for how much difference just a foot or two can make.

Building owners will save insurance money if they elevate above the BFE. But more impressive is how the cost of insurance can more than double if the building is only one foot below the BFE.

Remember!

The community may be able to grant a variance, but the owner will probably still be required to buy insurance. Imagine trying to sell a house if the bank requires insurance that costs over $5,000 a year!

WHAT IS THE ELEVATION CERTIFICATE?



- The Elevation Certificate (EC) is a FEMA form. Download a copy from the FEMA website ***https://www.fema.gov/forms-documents-and-software***.
- The EC must be completed and sealed by a registered surveyor or engineer when the floodplain has BFEs.
- A community official or property owner may complete the EC for sites in approximate flood zones.
- It can be used to confirm that structures are on natural ground and above the Base Flood Elevation (see ***page 21***).
- It is used to verify that buildings are elevated properly.
- Insurance agents use the EC to write flood insurance policies.
- By itself, the EC cannot be used to waive the requirement to get flood insurance. See ***page 20*** to learn about Letters of Map Amendment.

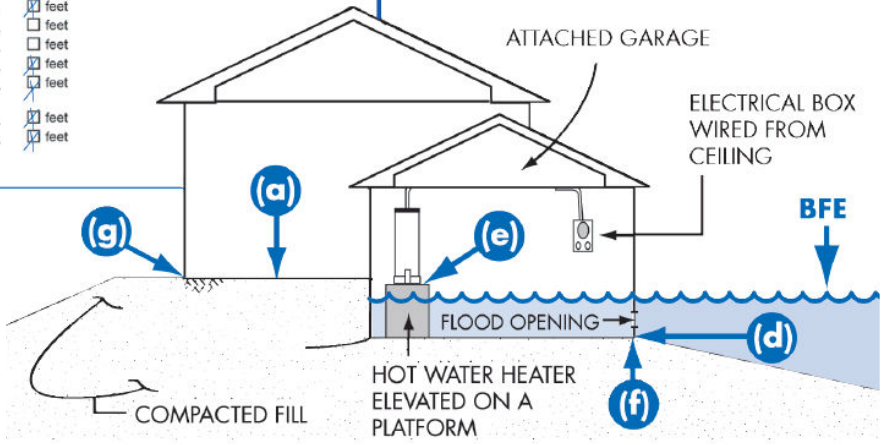
COMPLETING THE ELEVATION CERTIFICATE

SECTION C - BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

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

C2. Elevations – Zones A1-A30, AE, AH, A (with BFE), VE, V1-V30, V (with BFE), AR, AR/A, AR/AE, AR/A1-A30, AR/AH, AR/AO. Complete Items C2.a-g below according to the building diagram specified in Item A7.
Benchmark Utilized PA0025 Vertical Datum NAVD 1988
Conversion/Comments

a)	Top of bottom floor (including basement, crawl space, or enclosure floor)	627.0	☒ feet
b)	Top of the next higher floor	N/A	☐ feet
c)	Bottom of the lowest horizontal structural member (V Zones only)	N/A	☐ feet
d)	Attached garage (top of slab)	622.5	☒ feet
e)	Lowest elevation of machinery or equipment servicing the building (Describe type of equipment in Comments)	627.0	☐ feet
f)	Lowest adjacent (finished) grade (LAG)	622.5	☒ feet
g)	Highest adjacent (finished) grade (HAG)	626.8	☒ feet



In this example, the BFE is at 626 feet.

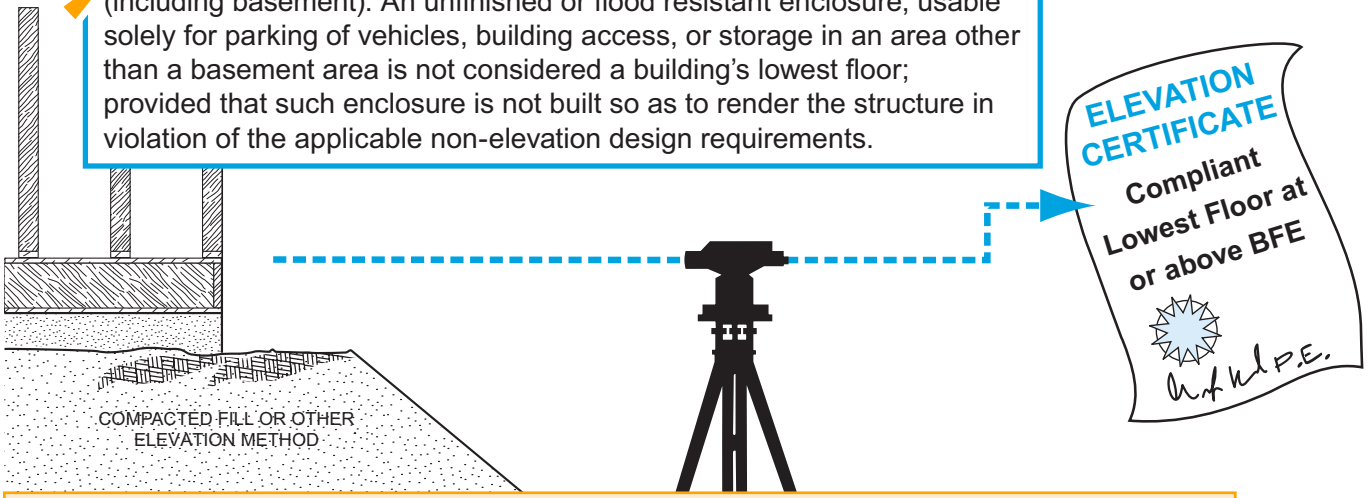
The slab-on-grade house was elevated on fill 1' above the BFE, and the vented garage is 3.5' below the BFE.

The Elevation Certificate must be completed and certified by a licensed land surveyor or engineer. The Elevation Certificate includes diagrams for several building types which indicate the various elevations that must be surveyed. Several points must be surveyed.

PAPERWORK IS IMPORTANT - FOR YOU AND YOUR COMMUNITY

Terms and Definitions

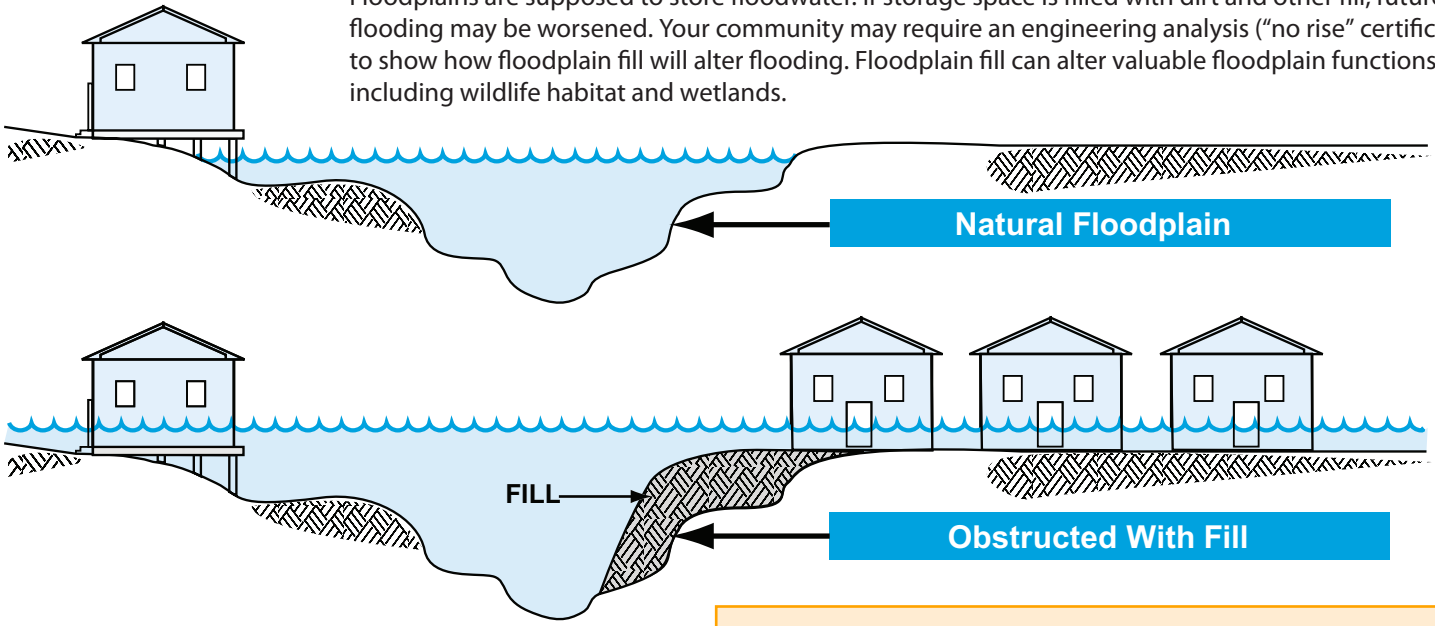
The **Lowest Floor** of the lowest enclosed area (including basement). An unfinished or flood resistant enclosure, usable solely for parking of vehicles, building access, or storage in an area other than a basement area is not considered a building's lowest floor; provided that such enclosure is not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



If you get a permit to build in the floodplain, you will be given an Elevation Certificate form. As soon as your lowest floor is set, get the form filled out and sealed by a surveyor or engineer. An "as-built" survey and Elevation Certificate will be required when construction is completed. **This form is important!** It proves that you built correctly, and it can be used to get the lowest cost flood insurance.

FLOODPLAIN FILL CAN MAKE THINGS WORSE

Floodplains are supposed to store floodwater. If storage space is filled with dirt and other fill, future flooding may be worsened. Your community may require an engineering analysis ("no rise" certificate) to show how floodplain fill will alter flooding. Floodplain fill can alter valuable floodplain functions, including wildlife habitat and wetlands.



Make sure your floodplain fill project won't harm your neighbors. Floodway fill is allowed **only** if an engineering evaluation demonstrates that "no rise" in flood level will occur (see ***page 35***).

"NO RISE" IN THE FLOODWAY

- The floodway is the most dangerous part of the floodplain.
- Development is not allowed unless "no rise" in flood levels is certified. "No rise" means no increase in flood elevations greater than 0.00 feet.
- A registered professional engineer must evaluate the hydraulic impact of proposed development.
- Check with your community or the Utah floodplain management office for guidance ***before*** you decide to work in a floodway.

ENGINEERING "NO-RISE" CERTIFICATION *(example)*

BE FLOOD ALERT — NATIONAL FLOOD INSURANCE PROGRAM

This is to certify that I am a duly qualified engineer licensed to practice in the State of Utah. It is to further certify that the attached technical data supports the fact that proposed ***(Name of Development)*** will not impact the Base Flood Elevations (100-year flood), floodway elevations and the floodway widths on ***(Name of Stream).***

Signature _____ *Seal* _____

Save time and money – don't build in the floodway!

NFIP VS 2018 I-CODE REQUIREMENTS

The International Residential Code (IRC) and International Building Code (IBC), by reference to ASCE 24, *Flood Resistant Design and Construction*, a design standard developed by the American Society of Civil Engineers (ASCE), include requirements that govern the design and construction of buildings and structures in flood hazard areas.

FEMA has determined that the flood provisions in the 2018 edition of the International Codes (I-Codes) meet or exceed the minimum NFIP requirements (44 CFR 60.3). **The State of Utah has adopted the 2018 IBC codes.** There may be some additional requirements and limitations found in the State requirements that are not in the NFIP regulations.

Some key points to keep in mind include:

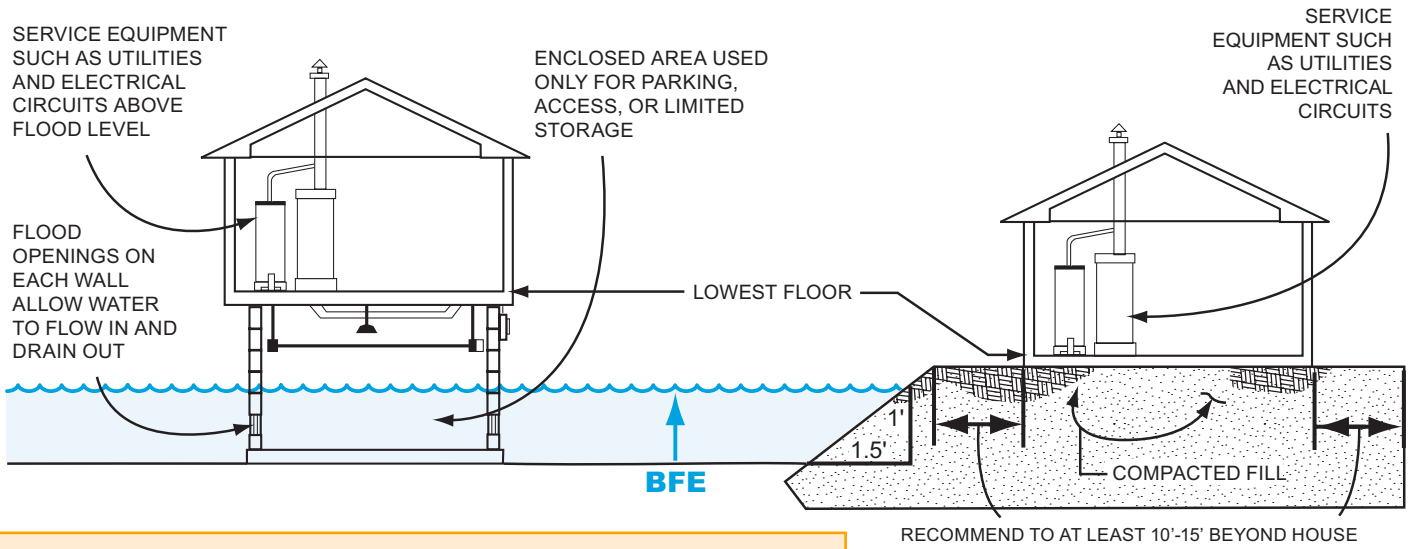
- NFIP refers to Base Flood Elevation (BFE) whereas I-Codes refer to Design Flood Elevation (DFE). The DFE is always the BFE or higher.
- IBC limits construction in high risk flood hazard areas, including alluvial fan, flash flood, mudslide, erosion-prone, high velocity flow, ice jam, and debris areas.
- 2018 IBC requires lowest floors to be at or above BFE plus one foot. Lowest floor elevations vary with Flood Design Class and are higher for certain uses, high occupancy buildings, and critical and essential facilities.
- Existing buildings must be brought into compliance with requirements for new construction when improvements, alterations, or repairs are determined to be substantial.
  - » When improvement costs equal or exceed 50% of pre-improvement building market value, it is considered Substantial Improvement
  - » When cost to repair to pre-damage condition is equal to or greater than 50% of pre-damage market value, it is considered Substantial Damage

Please review FEMA's Quick Reference Guide Comparison of Select NFIP and 2018 I-Code Requirements for Special Flood Hazard Areas for more information. ***https://www.fema.gov/media-library/assets/documents/25986***

HOW TO ELEVATE YOUR FLOODPLAIN BUILDING

ELEVATE ON FOUNDATION

ELEVATE ON FILL



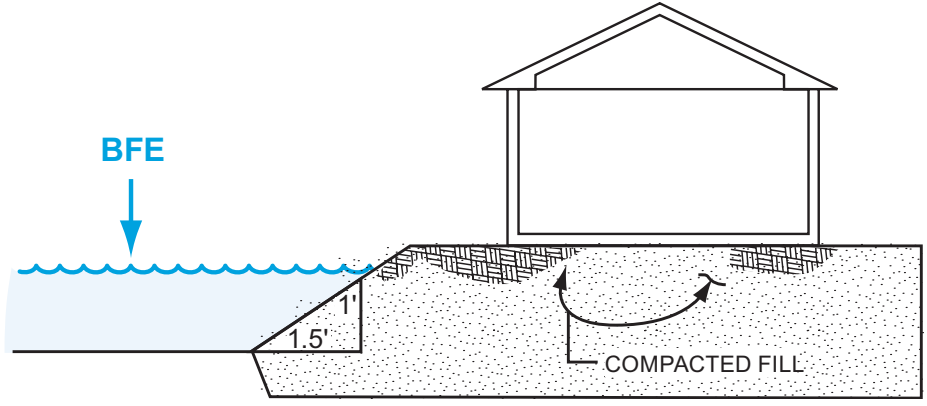
CAUTION! Enclosures (including crawlspaces) have some special requirements, see ***page 40***. Note: When the walking surface of the lowest floor is at the minimum elevation, under-floor utilities are not allowed. Fill used to elevate buildings must be placed properly (see ***page 38***).

CERTIFICATION OF FLOODPLAIN FILL

Earthen fill used to raise the ground above the base flood elevation must be placed properly so that it does not erode or slump when water rises.

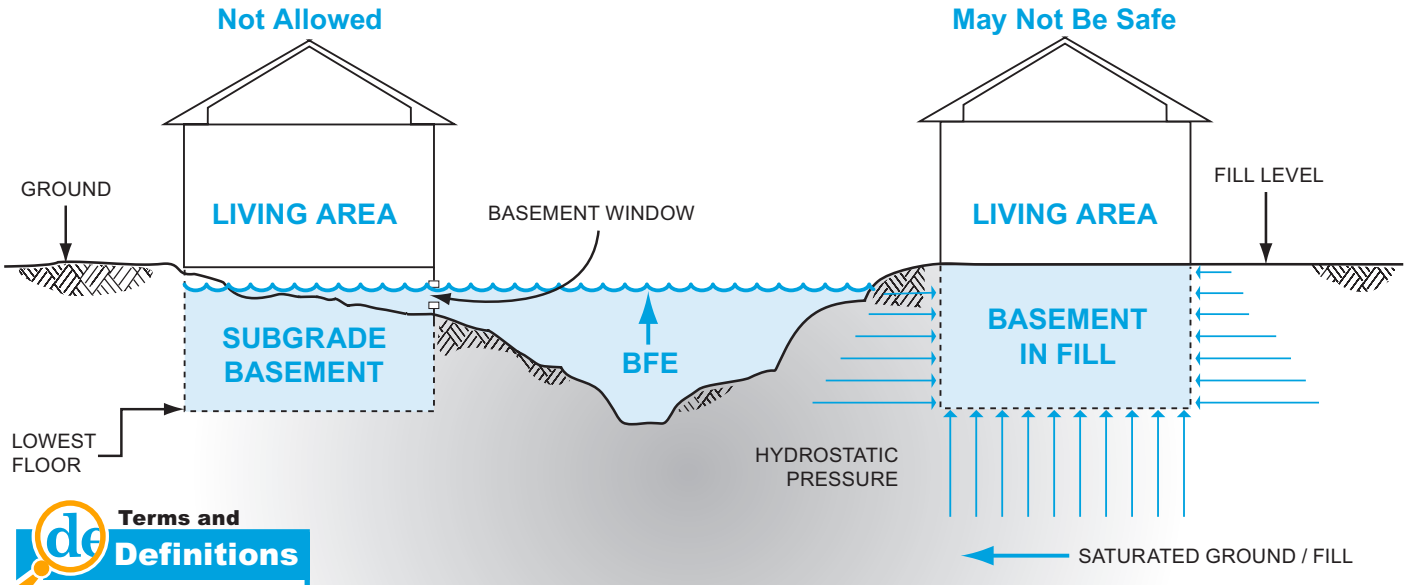
For safety and to meet floodplain requirements, floodplain fill must:

- 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 1.5:1 (1.5 feet horizontal extent for every one foot vertical rise)
- Have slopes protected against erosion (vegetation for "low" velocities, durable materials for "high" velocities – determined by a design professional



Your community will require certification of the elevation, compaction, slope, and slope protection materials in order to determine that the proposed structure will be "reasonably safe from flooding".

BASEMENTS ARE ESPECIALLY FLOOD-PRONE



Terms and Definitions

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

It is best practice to not construct a basement on any structure in the SFHA, or near the SFHA, even if technically removed from a SFHA via LOMA or LOMR-F. It only takes an inch of water over the sill and the entire basement can fill up! Excavating a basement into fill doesn't always make it safe because saturated groundwater can damage the walls.

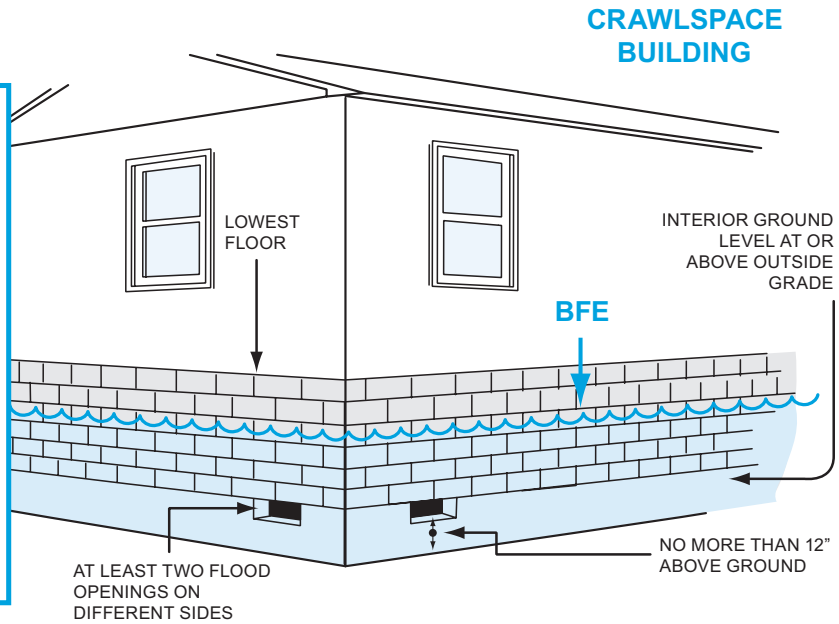
ENCLOSURES BELOW THE LOWEST FLOOR

Important

Information

NOTE:

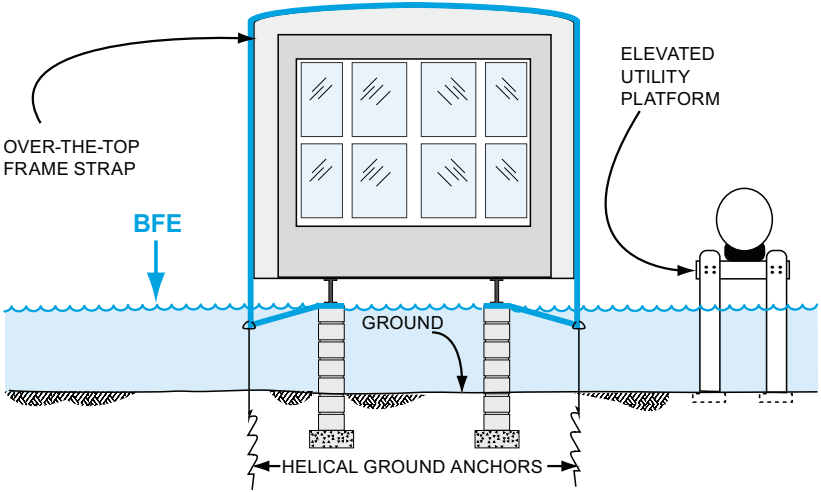
- Total net area of all total openings is 1 sq. inch per sq. foot of enclosed area
- A 30’ x 40’ building needs 1,200 sq. inches of openings
- If inserted in flood openings, typical air ventilation units must be disabled in the open position to allow water to flow in and out
- A typical air ventilation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

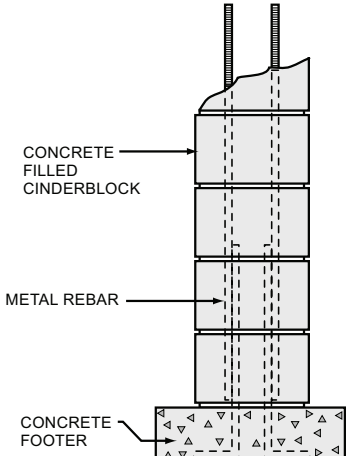


ALTERNATIVE: Engineered openings are acceptable **if certified** to allow adequate automatic inflow and outflow of floodwaters.

A crawlspace is an acceptable way to elevate just a couple of feet. In all cases, the following are required: openings/vents, elevated utilities, flood resistant materials, and limitation on use.

MANUFACTURED HOMES DESERVE SPECIAL ATTENTION



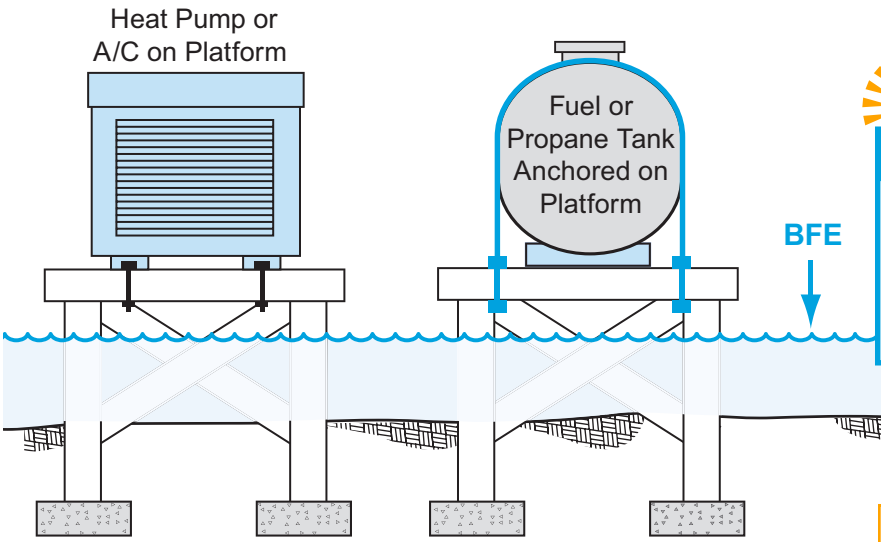


Experience shows that manufactured homes are easily damaged.
As little as one foot of water can cause substantial damage.

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

Manufactured homes must be anchored to resist flotation, collapse, or lateral movement by being tied down in accordance with your community's ordinance, or the manufacturer's installation specifications.

UTILITY SERVICE OUTSIDE BUILDINGS



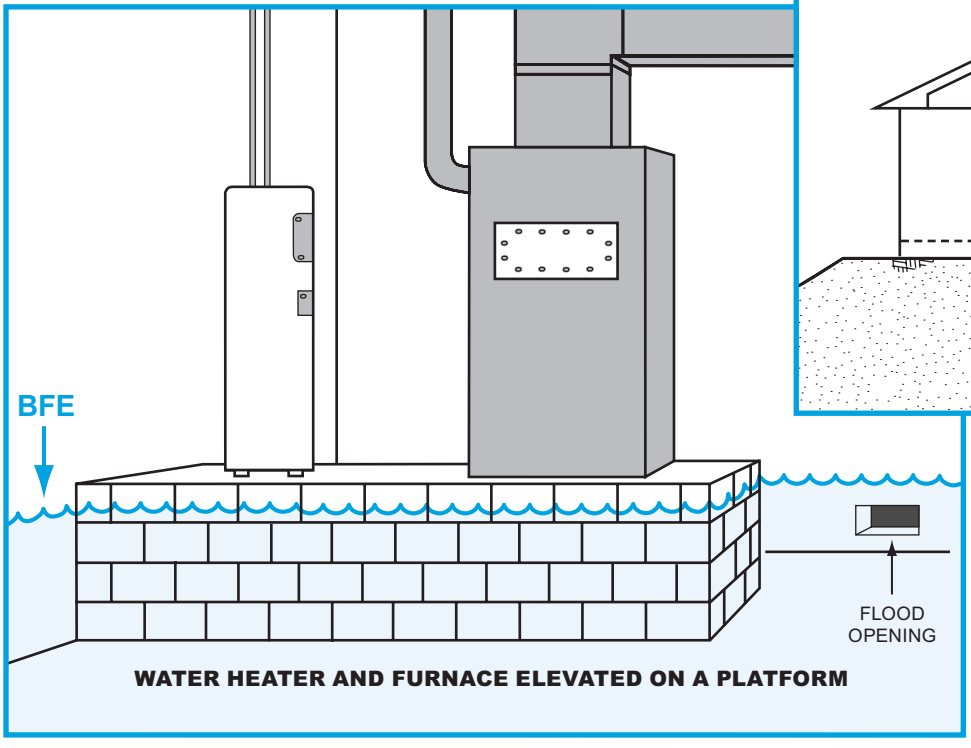
Important

Information

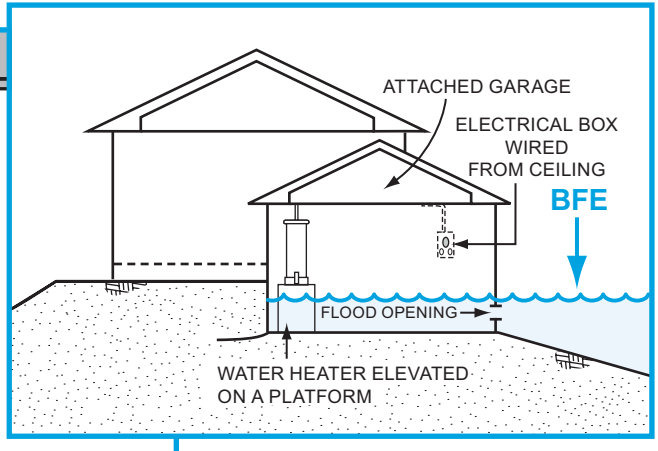
Fuel and propane tanks may cause explosion and pollution risks during flood conditions! Even shallow water can create large buoyant force on tanks, so extra care must be taken to ensure that all tanks are anchored.

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

UTILITY SERVICE INSIDE ENCLOSURES



WATER HEATER AND FURNACE ELEVATED ON A PLATFORM

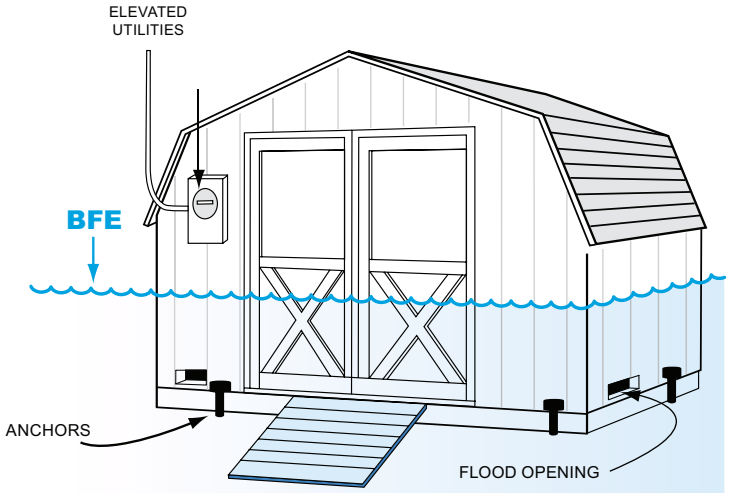


All utilities, appliances and equipment located inside enclosures must also be elevated one foot above BFE or protected two feet above BFE. Again, these utilities include plumbing, electrical, gas lines, heating and air conditioning.

ACCESSORY (APPURTENANT) STRUCTURES

In SFHA, accessory structures must:

- Not be habitable
- Be anchored to resist floating
- Have flood openings/vents
- Be built of flood resistant materials
- Have elevated utilities
- Be used only for storage or parking
- Not be modified for different use in the future
- Have documented floor elevation



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

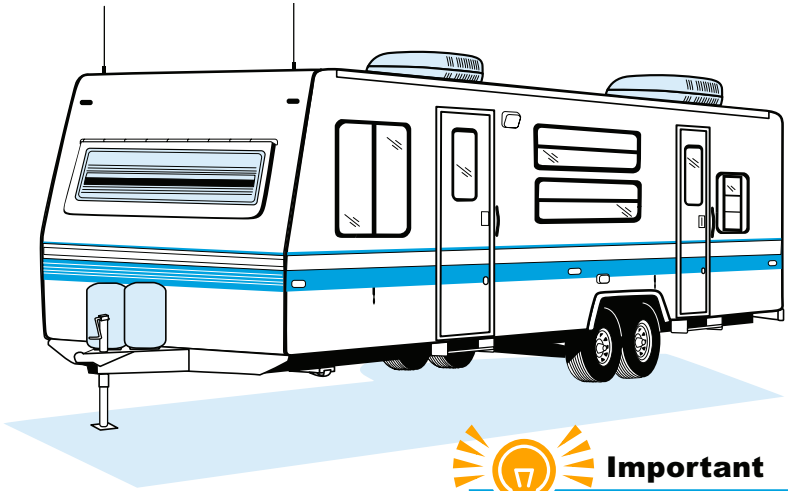
Terms and Definitions

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

RECREATIONAL VEHICLES

In a SFHA, an RV must:

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



RVs that do not meet these conditions must be installed and elevated like manufactured homes, including permanent foundations and tie-downs (see ***page 41***).

Important Information

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

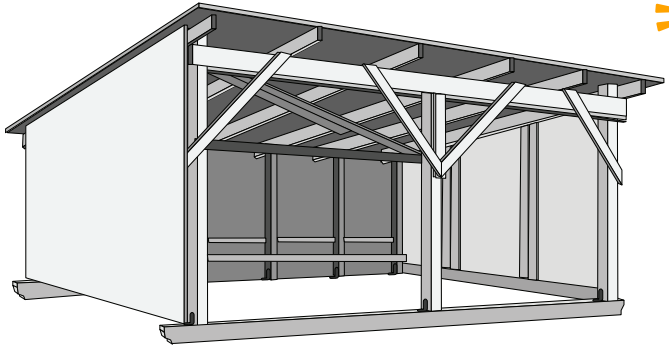
AGRICULTURAL STRUCTURES

Variances are allowed for:

- Pole frame buildings
- Steel grain bins
- Steel frame corn cribs
- General purpose feeding barns open on one side

Variances are not allowed for:

- Livestock confinement buildings
- Poultry houses
- Dairy operations
- Similar livestock operations



The best flood protection is to elevate agricultural buildings, but certain types can be approved by variance if they are “wet floodproofed”.

Important Information

Farm houses are ***not*** agricultural structures.

Contact the State Floodplain Manager for additional guidance on variances for agricultural structures.

PLANNING TO IMPROVE YOUR FLOODPLAIN BUILDING?

To obtain a permit to improve an existing building:

- You must provide a copy of your construction contract or a cost estimate (including estimated market value of your own or donated labor and materials).
- You may submit an independent assessment of the market value of the building, if performed by a licensed appraiser.
- Your community will compare the cost of the proposed work to the market value of the building and check the value of improvements.
- If the cost of the improvements equals or exceeds 50% of the market value of the building, it is considered a Substantial Improvement and you must bring the building into full compliance with your community floodplain ordinance.

Terms and Definitions

Substantial Improvement means any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure before the start of construction of the improvement. This term includes structures which have incurred **Substantial Damage**, regardless of the actual repair work performed (see ***page 48***).

Important Information

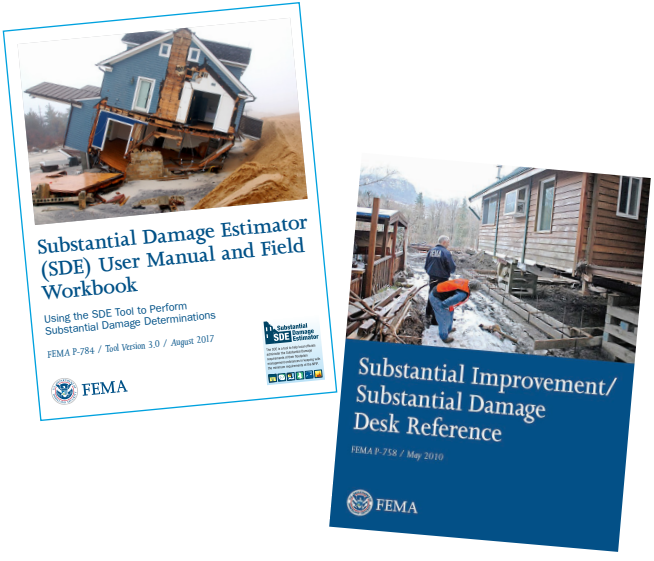
Floodplain buildings can be improved or altered, but special rules may apply!

If the cost of an addition to a Pre-FIRM structure is less than 50% of its market value, only the addition is required to be built 1 foot above the BFE. Check with your local permit office.

The cost to correct previously cited violations of state or local health, sanitary, or safety codes to provide safe living conditions can be excluded.

Alteration of a registered historic structure is allowed, as long as it will continue to meet the criteria for listing as a historic structure.

REPAIRING DAMAGED BUILDINGS



- The Substantial Damage Estimator (SDE) User's Manual and Workbook (FEMA P-784) was developed to assist community officials in estimating building value and repair costs.
- The Substantial Improvement/Substantial Damage Desk Reference (FEMA P-758) provides practical guidance and suggested procedures to assist community officials in implementing substantial improvement and substantial damage requirements.
- These guidance documents can be downloaded from the FEMA Library at ***www.fema.gov/library***

A permit is required to repair substantial damage from any cause – fire, flood, wind, or even a truck running into a building. Check with your community permit office before you begin repairs. You will be asked to provide a detailed cost estimate to repair the building to its pre-damaged condition. If the repair costs are 50% or more of the pre-damage market value of the building, then the repairs are considered Substantial Improvement and you must bring the building into full compliance. See ***page 50*** for more information about elevating an existing building on a crawlspace.

PAYING FOR POST-FLOOD COMPLIANCE

You may be eligible for up to $30,000 to help pay the costs to bring your building into compliance with your community's requirements – if all of the following apply:

- You have a NFIP flood insurance policy – it includes Increased Cost of Compliance (ICC) coverage.
- Your building is in the mapped Special Flood Hazard Area (SFHA).
- Your building's lowest floor is below the elevation required by your community.
- Your community has made an official determination that the building was substantially damaged by flooding.
- You act quickly with your claims adjuster and community official to process all the required paperwork.

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

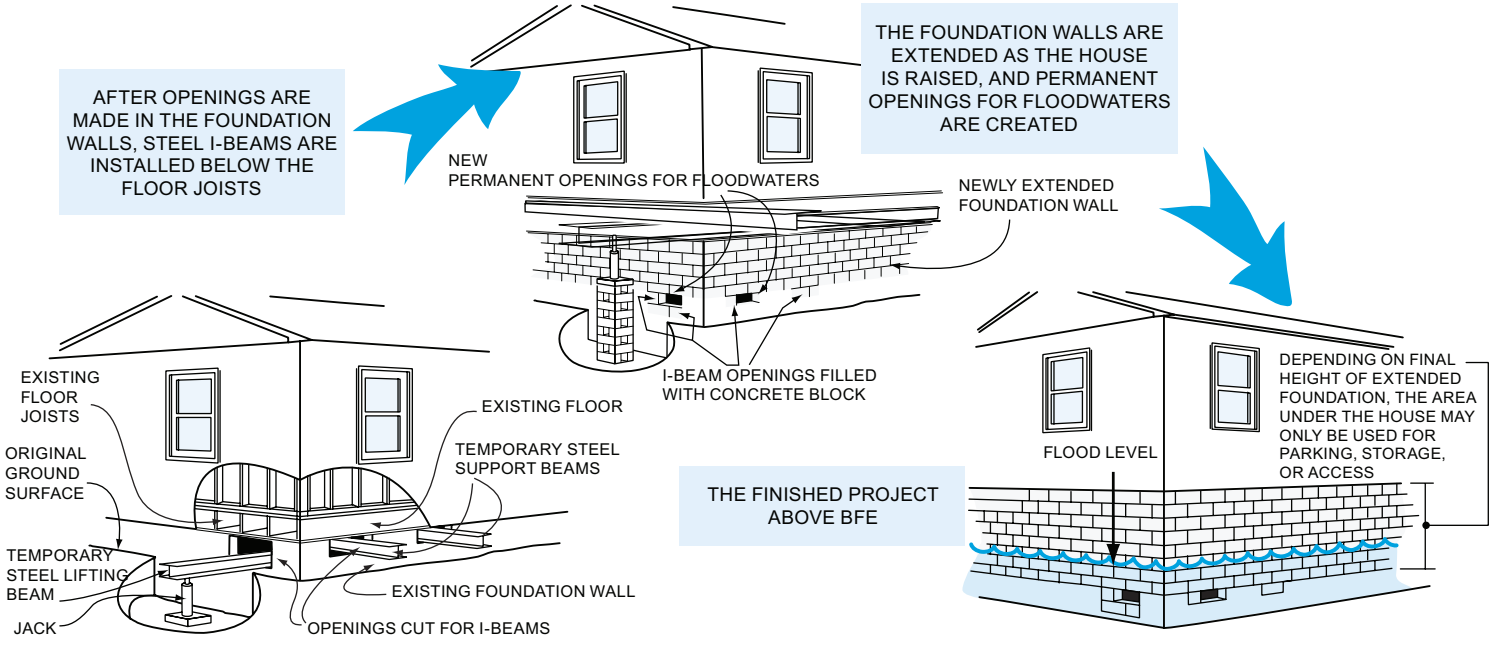
USE THE ICC CLAIM TO:

ELEVATE THE HOUSE ON YOUR LOT

DEMOLISH AND REBUILD THE HOUSE

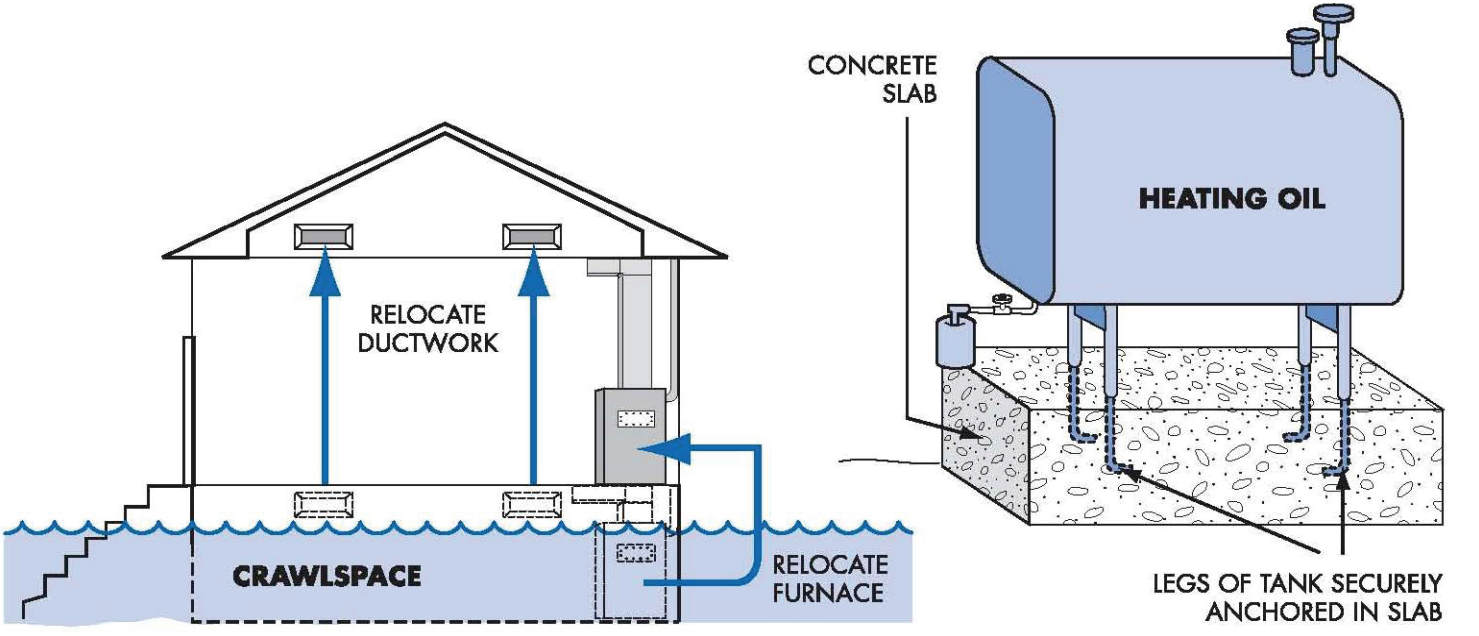
MOVE THE HOUSE TO HIGH GROUND

ELEVATING A PRE-FIRM BUILDING



This is one way to elevate an existing building to comply with floodplain regulations. The state and FEMA can help with more information and options.

SOME FLOOD PROTECTION FOR OLDER HOMES IS EASY AND LOW COST



Move your hot water heater and furnace out of the basement; or build small platforms for them. Anchor heating oil and propane gas tanks to prevent floatation. **Do not** store valuables in a flood-prone basement. Use water-resistant materials when you repair.

LIVING WITH LEVEES

Living with levees is a shared responsibility among the whole community; know your risk, know your role, and take action today!

- Levees and levee systems are designed to provide a specific level of risk reduction.
- The levee owner (typically a local community or Water Resource District) is responsible for proper operation and maintenance.
- When levees fail, or are overtopped, the results can be catastrophic.

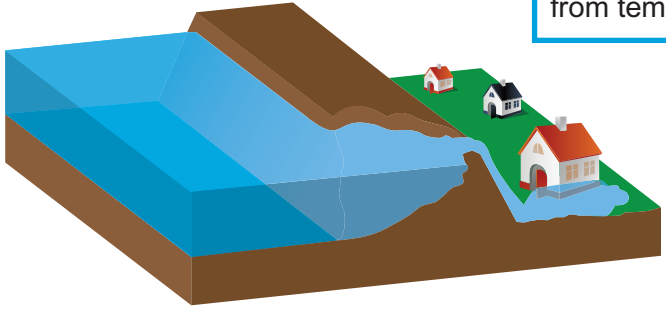
If a levee satisfies the regulatory design, maintenance, and operation criteria, FEMA will "accredit" the levee system as providing adequate risk reduction on the FIRM and the levee-impacted area will be shown as a moderate-risk area, labeled Zone X (shaded). Without this accreditation, the FIRM will show the impacted area as being within the Special Flood Hazard Area.

For additional FEMA accreditation information, please refer to 44 CFR 65.10 for NFIP regulations.

To learn more about levees, contact your local community official. Additional information is also provided on FEMA's Living with Levees website ***https://www.fema.gov/living-levees-its-shared-responsibility***.

Terms and Definitions

A **Levee** is a manufactured structure, usually an earthen embankment, designed and constructed in accordance with sound engineering practices to contain, control, or divert the flow of water so as to provide risk reduction from temporary flooding.



THE NFIP'S COMMUNITY RATING SYSTEM (CRS)

The NFIP's CRS is a voluntary program that provides communities the opportunity to reduce flood insurance premiums for its citizens. Communities must apply to the CRS and commit to implement and certify activities that contribute to reduced flood risk.

The reduction in flood insurance premiums can be anywhere from 5-45%, depending on the CRS level the community achieves with their activities.

Examples of actions your community can take to reduce the cost of your insurance premiums include:

- Preserve open space in the floodplain
- Enforce higher standards for safer development
- Undertake engineering studies and prepare flood maps
- Obtain grants to buy out or elevate houses or to floodproof businesses
- Maintain drainage systems
- Monitor flood conditions and issue warnings
- Inform people about flood hazards, flood insurance, and how to reduce flood damage

Community officials can request assistance from CRS specialists to help with the application process and prerequisites. Check the online CRS Resources Center (see ***page 56***).

BE FLOOD SAFE - DON'T DRIVE THROUGH FLOODED ROADS

- Flooding is the leading cause of severe weather-related deaths in the U.S.
- Flooded roads, bridges, and culverts may be washed out.
- Passenger cars may float in only 12-18 inches of flowing water.
- Floating cars easily get swept downstream, making it difficult to be rescued.
- Flash flooding in slot canyons can be caused by water traveling from many miles away, with travel times of 10 hours or more.
- In 2015, 21 people died in flash floods in Utah. More have died in the years following, including on roads and in slot canyons.

FLASH FLOODS ARE DANGEROUS!

Do not try to walk or drive through moving water on a flooded road. Don't enter slot canyons and rugged terrain during stormy or wet weather.

WANT TO LEARN MORE?

- For advice on flood information and permits, call your community's building permitting office or planning department.
- The Utah Division of Emergency Management coordinates the National Flood Insurance Program; on-line information is available at ***http://dem.utah.gov***.
- Learn more about flood insurance and the risks of flooding at ***http://floodfacts.utah.gov***.
- To order flood maps, call FEMA's Map Service Center at 1(877) FEMAMAP or order on-line at ***http://msc.fema.gov***.
- Learn more about flood maps and check the status of Map Change Requests at ***http://www.fema.gov/national-flood-insurance-program/flood-map-information***.
- You can order printed copies of FEMA publications from the FEMA Distribution Center. To place an order, call **1(800) 480-2520**.
- FEMA's on-line publications can be found in the FEMA Virtual Library. Many are posted in the Portable Document Format (PDF). Go to ***https://www.fema.gov/resource-document-library***.
- To learn about flood insurance, call your insurance agent. Most insurance companies can write an NFIP policy for you. If you need more help, call the National Flood Insurance Program's toll free number to get the name of an agent in your area who does write flood insurance. The number is **1(888) 379-9531**.
- To get the best rates for flood insurance, call a local surveyor to complete an Elevation Certificate.
- For additional information about flood insurance, visit ***www.floodsmart.gov***.

ACRONYMS AND OTHER RESOURCES

Common Acronyms

- BFE = Base Flood Elevation
- BLE = Base Level Engineering
- CRS = Community Rating System
- DFIRM = Digital Flood Insurance Rate Map
- EC = Elevation Certificate
- FEMA = Federal Emergency Management Agency
- FIRM = Flood Insurance Rate Map
- FIS = Flood Insurance Study
- GIS = Geographic Information System
- MSC = Map Service Center
- NFHL = National Flood Hazard Layer
- NFIP = National Flood Insurance Program
- SFHA = Special Flood Hazard Area
- UDEM = Utah Division of Emergency Management

Useful Resources

- Family disaster planning: ***http://www.redcross.org/prepare/location/home-family***
- Information for flood victims: ***https://www.fema.gov/recovery-resources***
- CRS Resource Center: ***http://training.fema.gov/EMIWeb/CRS***
- Protecting Your Property or Business from Disaster: ***http://www.fema.gov/protect-your-property-or-business-disaster***
- Utah Division of Emergency Management: ***http://dem.utah.gov***
- Utah's "Make Your Family Disaster Plan": ***http://www.utah.gov/beready/family***
- Living with Levees: ***http://www.fema.gov/living-levees-its-shared-responsibility***

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