

Quick Guide

DNR Indiana Department
of Natural Resources

Indiana Department of Natural Resources
Division of Water

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About This Guide

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

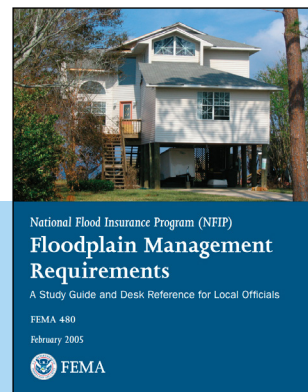
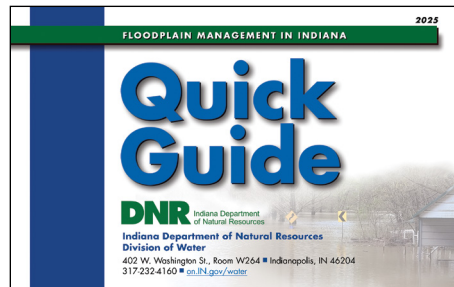
This **Quick Guide** was developed and funded jointly by the Indiana Department of Natural Resources (IDNR) and the Federal Emergency Management Agency (FEMA).

Questions, comments and requests for additional copies should be directed to the IDNR Division of Water at dowfpm@dnr.IN.gov or water_inquiry@dnr.IN.gov.

Prepared by:

RCQUINN
CONSULTING, INC.

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*.



FLOODPLAIN MANAGEMENT & THE NFIP

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- 3 Indiana Disaster and Floodplain Facts
- 4 What is the National Flood Insurance Program?
- 5 Community Responsibilities
- 6 NFIP Recommended Planning Considerations
- 7 The NFIP's Community Rating System (CRS)
- 8 Flood Insurance: Property Owner's Financial Protection



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.

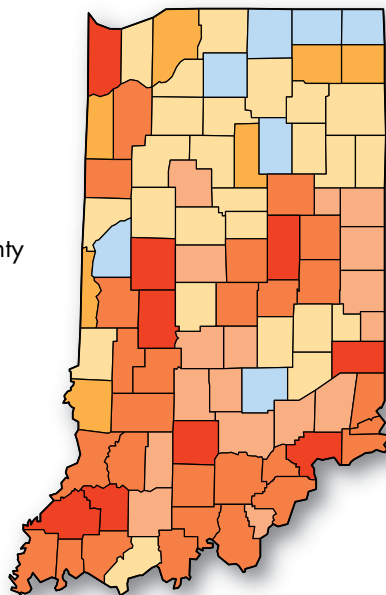
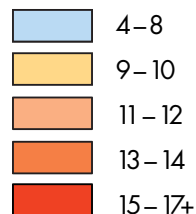
To avoid liability and lawsuits. If we know an area is mapped as a flood hazard area, and if we know people could be in danger and buildings could be damaged, doesn't it make sense to take reasonable protective steps as our communities develop and redevelop?

Since 1978, NFIP flood insurance policy holders in Indiana have received over \$284 million in claim payments. Even though that represents many payments, most of the State's floodprone property owners do not have flood insurance.

Indiana Disaster and Floodplain Facts

Federal Disaster Declarations

Number of
Declarations by County
(1988 to mid-2025)



- More than half of Indiana's declared disasters involved flooding. Winter storms and tornadoes account for the rest.
- Most counties, cities, and towns in Indiana 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.
- Two counties and 65 municipalities are floodprone but elect to not participate in the National Flood Insurance Program and do not enforce floodplain management regulations (as of March 2025).

Many 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.

What is the National Flood Insurance Program?

The National Flood Insurance Program (NFIP) was created by Congress in 1968 to protect lives and property and to reduce the financial burden of providing disaster assistance. The NFIP is administered by the Federal Emergency Management Agency (FEMA). Nationwide, over 22,700 communities participate in the NFIP. In Indiana, more than 450 counties, cities and towns participate.

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

- **Flood hazard maps.** In partnership with river basin commissions, 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.

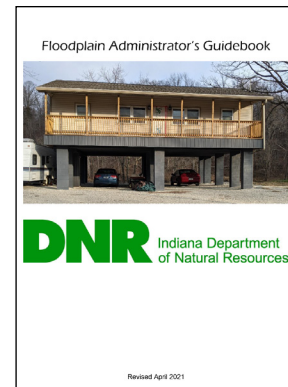


To learn more about the NFIP, including your potential flood risk and the approximate cost of a flood insurance policy, go to FEMA's FloodSmart website www.floodsmart.gov.

Community Responsibilities

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

- **Recognize** flood hazards in community planning ([see page 6](#))
- **Adopt and enforce** flood maps and a flood damage prevention ordinance
- **Require** permits for all types of development in the floodplain ([see page 32](#))
- **Assure** that building sites are reasonably safe from flooding
- **Require** new and substantially improved homes and manufactured homes to be elevated to or above the Flood Protection Grade (FPG), which is the BFE + 2 ft.
- **Require** nonresidential buildings to be elevated or dry floodproofed to or above the FPG (BFE + 2 ft.)
- **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 24, 25, and 26](#))
- **Carefully consider** requests for variances
- **Resolve** non-compliance and violations of floodplain management requirements
- **Advise and work** with FEMA and the IDNR Division of Water when updates to flood maps are needed
- **Maintain** records for review and respond to periodic requests from IDNR and FEMA



NFIP Recommended Planning Considerations

Indiana 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
- **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 (e.g., above the State minimum FPG)
- **Require** elevation methods such as pilings or columns rather than fill to maintain the storage capacity of the floodplain and to minimize environmental impacts
- **Require** evacuation plans for manufactured home parks and subdivisions

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

Community officials can request assistance from CRS specialists to help with the application process and prerequisites. Check the online CRS Resource Center ([see page 79](#)).

Property owners in 33 Indiana communities that participate in the CRS receive premium discounts ranging from 5% to 15% (as of January 2025).

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.

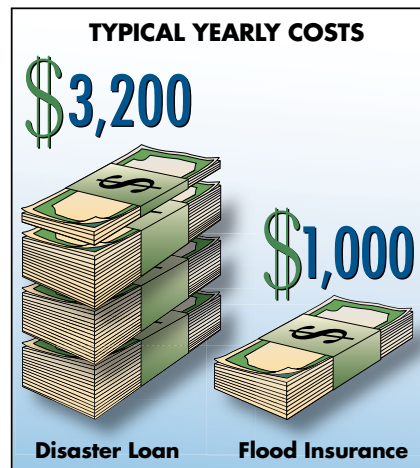
Who can purchase flood insurance? Homeowners, business owners, and renters in communities that participate in the NFIP may purchase NFIP flood insurance on any building and its contents, even buildings outside of mapped flood zones.

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 40% 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.

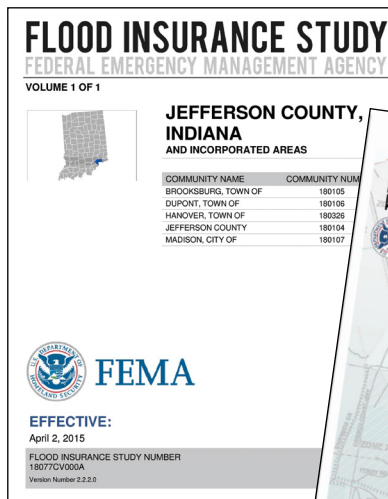
Want to know more? Learn more at www.floodsmart.gov. To purchase a policy, call your insurance agent.



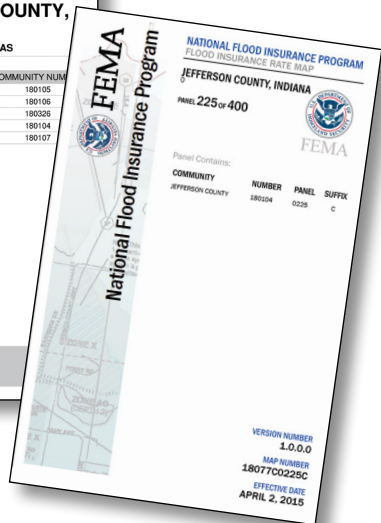
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Looking for FEMA Flood Map Information?



- 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 FISs and 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, engineering, permit offices, and river basin commissions may also have paper flood maps available for viewing by the public.

Localized Flooding Risks

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

- Debris and trash that block 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



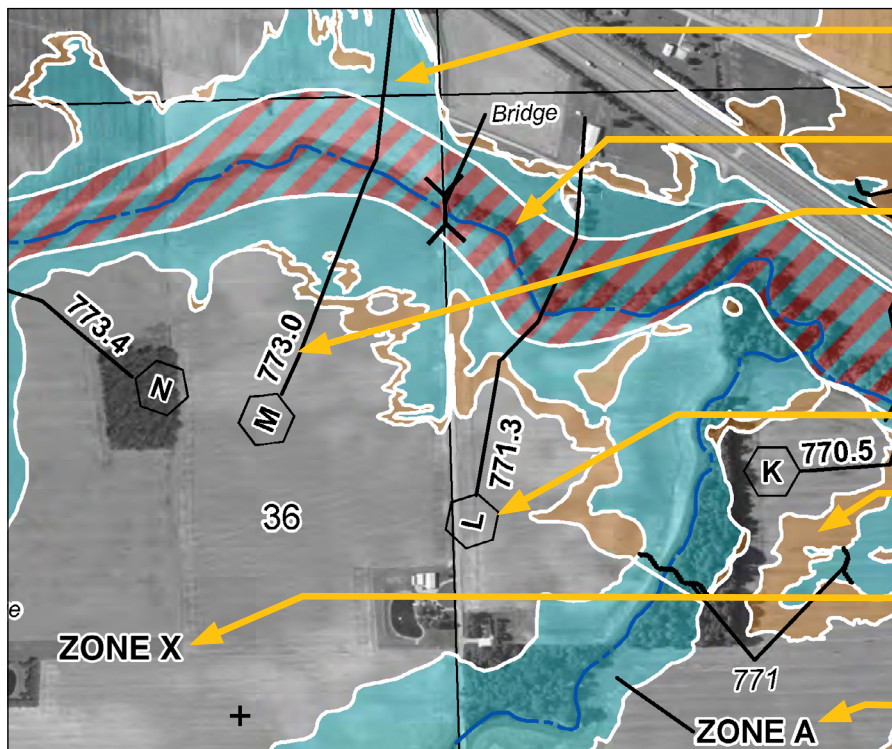
Important

Information

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

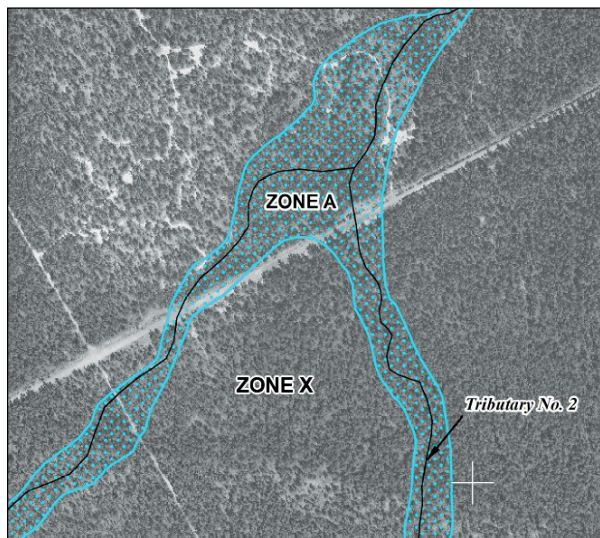
More than 40% of NFIP insurance claims are paid on losses in low and moderate risk zones outside of mapped SFHAs.

Flood Insurance Rate Map (Riverine)



- 1 **Zone AE** is the 1% annual chance (100-year) floodplain with BFEs (formerly Zones A1- A30).
- 2 The **Floodway** is the cross-hatched area ([see page 28](#)).
- 3 **Base Flood Elevation (BFE)** is the water surface elevation of the base flood rounded to the nearest tenth of a foot (consult FIS profiles and tables for more accurate elevations).
- 4 **Cross Section** location ([see page 15](#)).
- 5 **Shaded Zone X** is the 0.2% annual chance (500-year) floodplain (formerly Zone B).
- 6 **Unshaded Zone X** is all other areas considered low risk (formerly Zone C).
- 7 **Zone A** (approximate) is the flood hazard area without BFEs.

Approximate Flood Zones



FEMA uses existing information – not engineering studies – to draw Approximate Zone A boundaries.

For sites where the upstream drainage area is greater than one square mile, base flood elevations and/or floodway limits must be obtained from the IDNR Division of Water ([see page 39](#)).

For sites where the upstream drainage area is less than one square mile, applicants must provide engineering analyses showing the limits of the floodplain and the 1% annual chance flood elevation for the site.

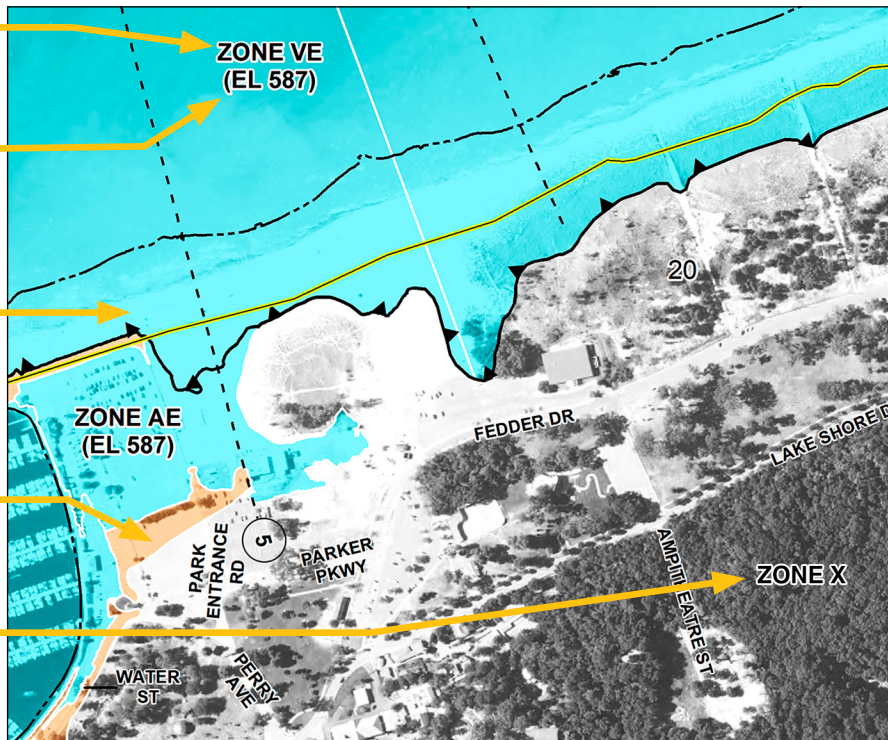
de **Terms and Definitions**

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

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.

Flood Insurance Rate Map (Great Lakes)

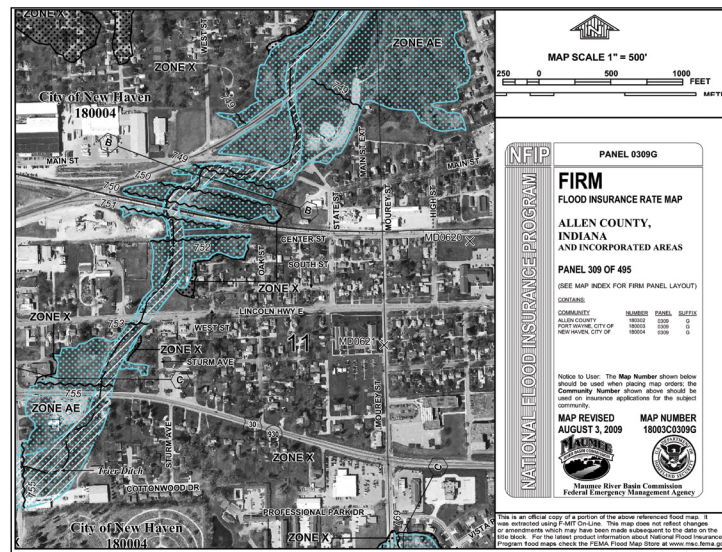
- 1 Zone VE** is where wave heights are expected to be 3 feet or more.
- 2 Base Flood Elevation (BFE)** is the water surface elevation of the base flood (consult FIS tables for more accurate elevations).
- 3 Zone AE** is subject to flooding by the base or 1% annual chance (100-year) flood, and waves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



FIRMette: FEMA Flood Maps Online

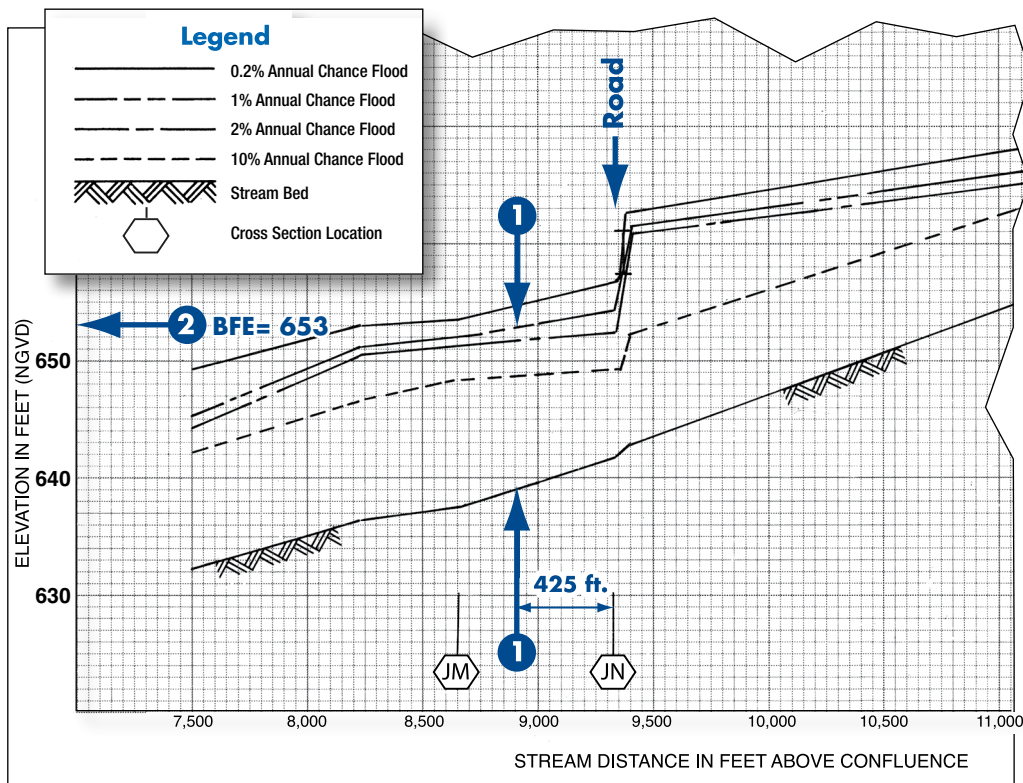
Portions of flood maps can be produced, saved, and printed by making a "FIRMette." FIRMettes are full-scale sections of FIRMs.

- 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 <Search by Address> 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 “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.

Using the Riverine Flood Profile to Determine Riverine BFEs



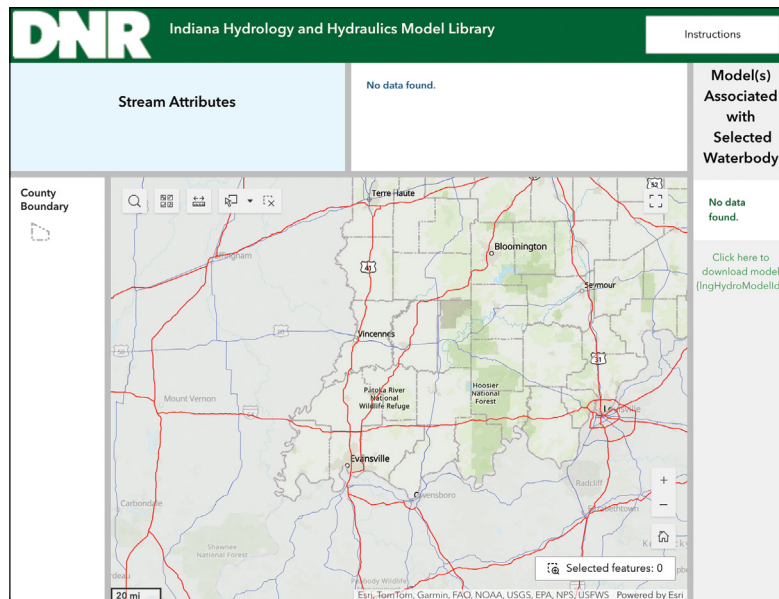
Flood Profiles from Flood Insurance Study reports can be used to determine the BFE at a specific site. Profiles also show estimated water surface elevations for floods other than the 1% annual chance flood (100-year).

- 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.
- 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: 653 feet).

Indiana Hydrology and Hydraulics Model Library

Engineers, local officials and others sometimes need to use hydraulic models to evaluate proposed projects or determine flood elevations in floodplains. Hydraulic models prepared by IDNR and FEMA for many streams are available online.

Use the **Indiana Hydrology and Hydraulics Model Library** to click on the stream segment of interest to view and download hydrology and hydraulic model information. Some stream segments may have multiple models, including the original models used to produce FIRMs, Construction in a Floodway permit models, updated models, and models developed for Letters of Map Revision.



Access the Model Library and instructions at: <https://on.in.gov/hydro-library>.

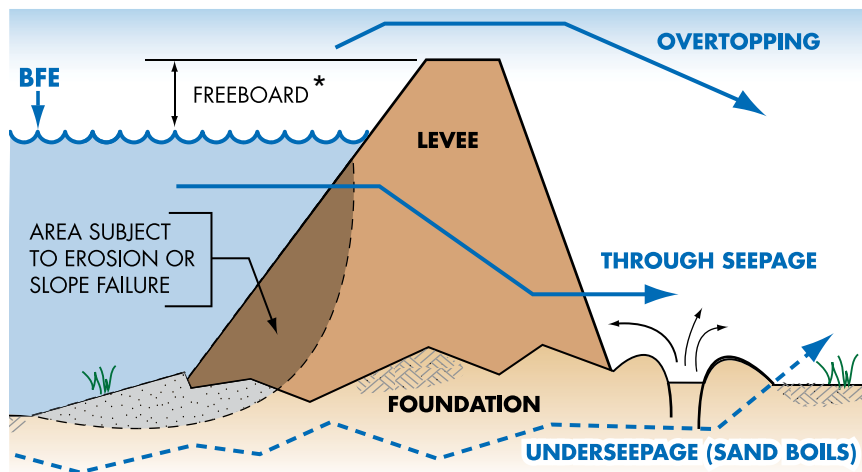
Contact Division of Water at water_inquiry@dnr.in.gov.

Levee Certification for FIRMs

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

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

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



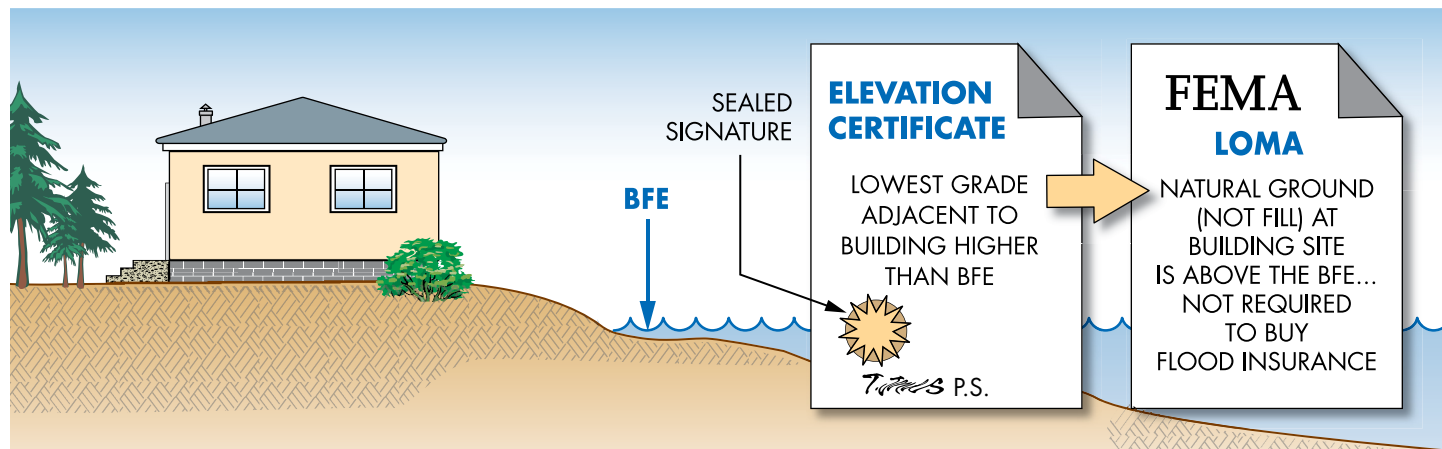
* Freeboard is the distance between the BFE and the top of the levee; for FEMA accreditation freeboard is usually 3 feet

FEMA LETTERS OF MAP CHANGE

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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 19](#)). 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 IDNR 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.

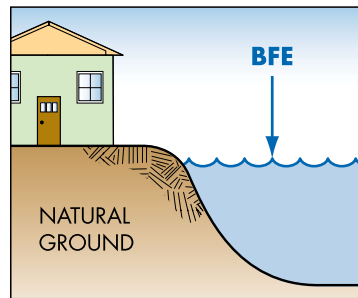
FIRM Revisions: Letters of Map Amendment (LOMA)

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 21](#).



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

Letter of Map Amendment Out-As-Shown (LOMA-OAS)

Although FEMA uses the most accurate flood hazard information available, limitations of scale or topographic definition of source maps may make SFHA determinations difficult. Flood Hazard Determinations prepared for lending institutions sometimes identify buildings as located in the SFHA, even though only a portion of the property is in.

Apply to FEMA for a LOMA-OAS. Property owners may apply to FEMA for a LOMA-OAS. The letter officially shows that a property or structure is not located in the mapped SFHA. FEMA does not charge a processing fee.

- Read FEMA's instructions and download the MT-EZ form here https://www.fema.gov/sites/default/files/documents/fema_letter-map-amendment-out-shown.pdf.
- Download a FIRMette for the property ([see page 14](#)).
- Obtain mapping and survey data for the property, usually available from the community where the property is located.
- Make a copy of a recorded Plat Map for the property or a copy of the recorded deed for the property and a copy of the local tax assessor's map of the neighborhood in question (or other map that shows both property lines and local roads and watercourses).
- Complete the MT-EZ application form.

A LOMA-OAS eliminates the Federal flood insurance purchase requirement as a condition of Federal or federally-backed financing. However, mortgage lenders retain the prerogative to require flood insurance.

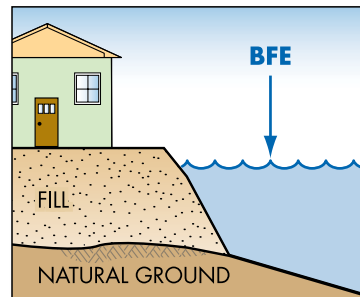
FIRM Revisions: Letters of Map Revision Based on Fill (LOMR-F)

Letter of Map 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.

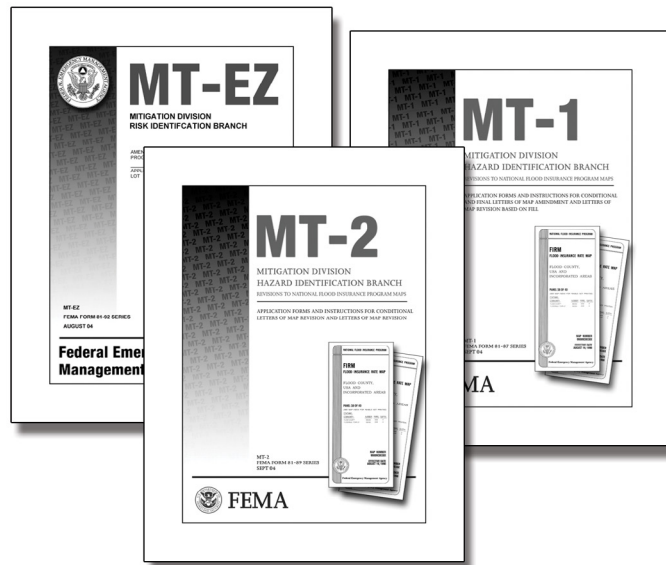
Property owners whose building sites are in the SFHA but on natural ground that is above the BFE can request Letters of Map Amendment (LOMAs) described on [page 19](#).



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 at <https://www.fema.gov/flood-maps/change-your-flood-zone/loma-lomr-f>.

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.
- **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. Certificates of Occupancy/Compliance should be withheld until receipt of the final LOMR based on “as-built” documentation and certification.

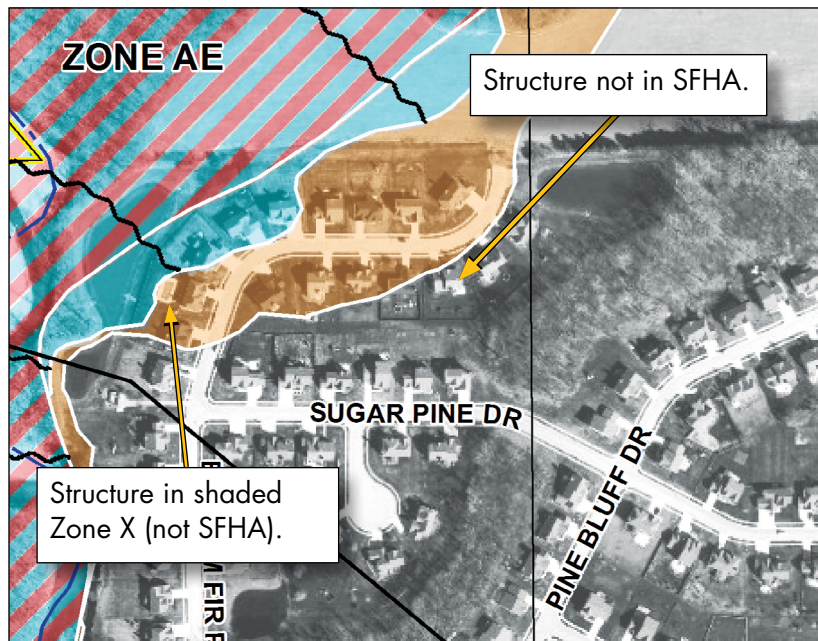


To learn more and download forms, find links by searching key words “MT-EZ,” “MT-1,” and “MT-2.”

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 14](#)) 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 19](#)).



ELEVATION CERTIFICATE

24 What is the Elevation Certificate and How is it Used?

25 Completing the Elevation Certificate

26 Paperwork is Important for Owners



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 professional surveyor licensed in Indiana.
- Community officials may complete the EC for sites in Zone AO.
- It can be used to show that lowest grades adjacent to planned or existing building sites are above the Base Flood Elevation (see page 18).
- 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.

By itself, the EC **cannot** be used to waive the mortgage lender requirement to obtain flood insurance. See page 19 to learn about FEMA's Letter of Map Amendment process.

The image shows two FEMA Elevation Certificate forms. The top form is the 'ELEVATION CERTIFICATE' (FEMA Form FF-2024-7-20-152) and the bottom form is the 'FLOOD INSURANCE RATE MAP (FIRM) INFORMATION' (FEMA Form FF-2024-7-20-152). Both forms include sections for property information, building information, and flood insurance information.

SECTION A - PROPERTY INFORMATION

A1. Building Owner's Name: _____ Policy Number: _____
 A2. Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.: _____ Company Name: _____
 City: _____ State: _____ ZIP Code: _____
 A3. Property Description (e.g., Lot and Block Numbers or Legal Description) and/or Tax Parcel Number: _____

A4. Building Use (e.g., Residential, Non-Residential, Addition, Accessory, etc.): _____
 A5. Left/Right of Way: Left _____ Right _____ Horizontal Datum: ☐ NAD 1927 ☐ NAD 1983 ☐ WGS 84
 A6. Attach at least two and when possible four clear photographs (one for each side) of the building (see Form pages 7 and 8).
 A7. Building Diagram Number: _____
 A8. For a building with a crawlspace or enclosure(s):
 a) Square footage of crawlspace or enclosure(s): _____ sq. ft.
 b) Is there at least one permanent flood opening on two different sides of each enclosed area? ☐ Yes ☐ No ☐ N/A
 c) Enter number of permanent flood openings in the crawlspace or enclosure(s) within 1.0 foot above adjacent grade:
 Non-engineered flood openings: _____ Engineered flood openings: _____
 d) Total net open area of non-engineered flood openings in AB: _____ sq. ft.
 e) Total rated area of engineered flood openings in AB: (attach documentation - see instructions) _____ sq. ft.
 f) Sum of AB and AE rated area (if applicable - see instructions) _____ sq. ft.
 A9. For a building with an attached garage:
 a) Square footage of attached garage: _____ sq. ft.
 b) Is there at least one permanent flood opening on two different sides of the attached garage? ☐ Yes ☐ No ☐ N/A
 c) Enter number of permanent flood openings in the attached garage within 1.0 foot above adjacent grade:
 Non-engineered flood openings: _____ Engineered flood openings: _____
 d) Total net open area of non-engineered flood openings in AB: _____ sq. ft.
 e) Total rated area of engineered flood openings in AB: (attach documentation - see instructions) _____ sq. ft.
 f) Sum of AB and AE rated area (if applicable - see instructions) _____ sq. ft.

SECTION B - FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

B1. NFIP Community Name: _____
 B2. County Name: _____ B3. Building Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.: _____
 B4. FIRM Issue Date: _____ B5. FIRM Base Flood Elevation: _____
 B6. FIRM Zone(s): _____
 B7. Indicate the source of the BFE data or Base Flood Elevation: ☐ FIRM ☐ FIRM ☐ Community Determined ☐ Other
 B8. Indicate elevation datum used for BFE in Item B7: _____
 B9. Is the building located in a Coastal Barrier Resource Designation Area? ☐ CBRP
 B10. Is the building located seaward of the Limit of Wave Action? ☐ LWA
 B11. Indicate elevation datum used for BFE in Item B7: _____
 B12. Is the building located in a Coastal Barrier Resource Designation Area? ☐ CBRP
 B13. Is the building located seaward of the Limit of Wave Action? ☐ LWA

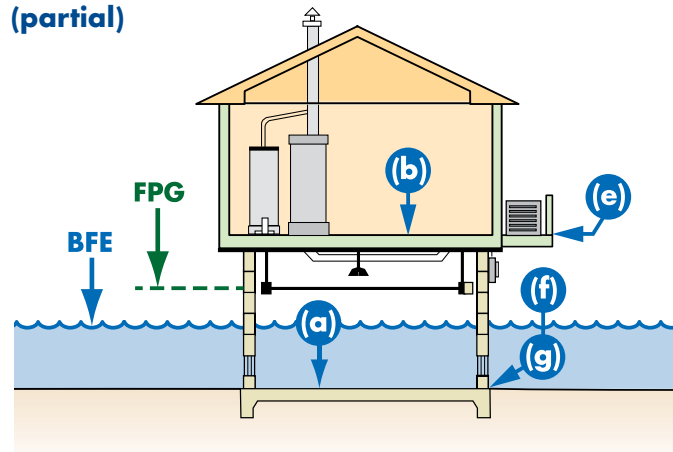
SECTION C - BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

C1. Building elevations are based on: ☐ Construction Drawings ☐ Building Owner's Statement ☐ Field Notes
 C2. Elevations - Zone A, AE, AF, AH, A1, A2, A3, A4, A5, A6, A7, A8, A9, A10, A11, A12, A13, A14, A15, A16, A17, A18, A19, A20, A21, A22, A23, A24, A25, A26, A27, A28, A29, A30, A31, A32, A33, A34, A35, A36, A37, A38, A39, A40, A41, A42, A43, A44, A45, A46, A47, A48, A49, A50, A51, A52, A53, A54, A55, A56, A57, A58, A59, A60, A61, A62, A63, A64, A65, A66, A67, A68, A69, A70, A71, A72, A73, A74, A75, A76, A77, A78, A79, A80, A81, A82, A83, A84, A85, A86, A87, A88, A89, A90, A91, A92, A93, A94, A95, A96, A97, A98, A99, A100, A101, A102, A103, A104, A105, A106, A107, A108, A109, A110, A111, A112, A113, A114, A115, A116, A117, A118, A119, A120, A121, A122, A123, A124, A125, A126, A127, A128, A129, A130, A131, A132, A133, A134, A135, A136, A137, A138, A139, A140, A141, A142, A143, A144, A145, A146, A147, A148, A149, A150, A151, A152, A153, A154, A155, A156, A157, A158, A159, A160, A161, A162, A163, A164, A165, A166, A167, A168, A169, A170, A171, A172, A173, A174, A175, A176, A177, A178, A179, 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Completing the Elevation Certificate

SECTION C – BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)			
C1. Building elevations are based on: <input type="checkbox"/> Construction Drawings* <input type="checkbox"/> Building Under Construction* <input checked="" type="checkbox"/> Finished Construction <small>*A new Elevation Certificate will be required when construction of the building is complete.</small>			
C2. Elevations – Zones A1–A30, AE, AH, AO, A (with BFE), VE, V1–V30, V (with BFE), AR, ARIA, ARI/AE, ARI/A1–A30, ARI/AH, ARI/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. <input type="checkbox"/> NGVD 1929 <input checked="" type="checkbox"/> NAVD 1988 <input type="checkbox"/> Other: _____			
Datum used for building elevations must be the same as that used for the BFE. Conversion factor used? <input type="checkbox"/> Yes <input type="checkbox"/> 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):	625.80	<input checked="" type="checkbox"/> feet	<input type="checkbox"/> meters
b) Top of the next higher floor (see Instructions):	633.00	<input checked="" type="checkbox"/> feet	<input type="checkbox"/> meters
c) Bottom of the lowest horizontal structural member (see Instructions):	N/A	<input type="checkbox"/> feet	<input type="checkbox"/> meters
d) Attached garage (top of slab):	N/A	<input checked="" type="checkbox"/> feet	<input type="checkbox"/> 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):	633.00	<input checked="" type="checkbox"/> feet	<input type="checkbox"/> meters
f) Lowest Adjacent Grade (LAG) next to building: <input type="checkbox"/> Natural <input checked="" type="checkbox"/> Finished	623.40	<input checked="" type="checkbox"/> feet	<input type="checkbox"/> meters
g) Highest Adjacent Grade (HAG) next to building: <input type="checkbox"/> Natural <input checked="" type="checkbox"/> Finished	623.40	<input checked="" type="checkbox"/> feet	<input type="checkbox"/> meters
h) Finished LAG at lowest elevation of attached deck or stairs, including structural support:	623.40	<input checked="" type="checkbox"/> feet	<input type="checkbox"/> meters

ELEVATION CERTIFICATE (partial)

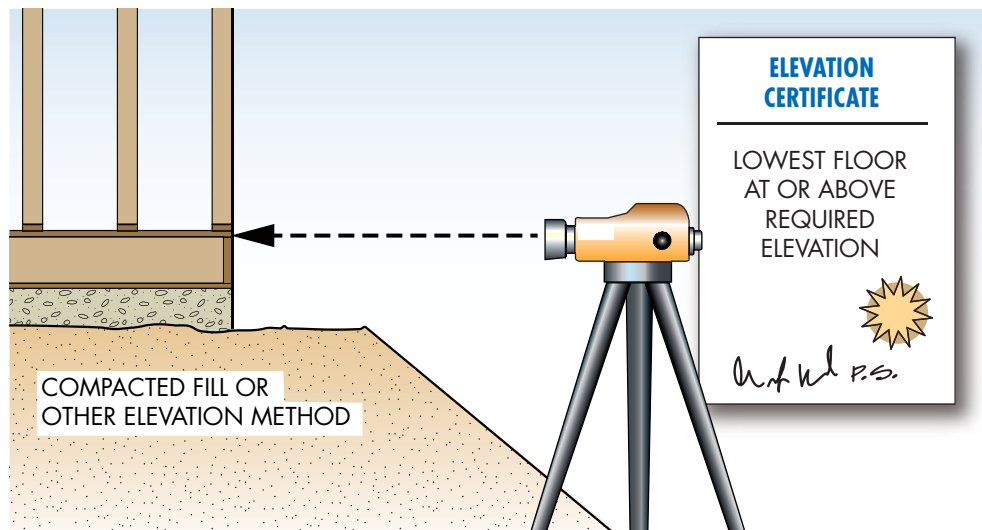


In this example, the BFE is 625.0 and the FPG is 627.0.

The house is elevated on a perimeter wall foundation, with flood openings. The lowest floor is high enough to use the enclosed area for parking and building access.

A professional surveyor must fill out and seal the EC form. The EC includes diagrams for different building types. Several points must be surveyed. Although an EC is required only for finished construction ("as-built"), it's a good practice to complete the EC when the lowest floor is set and prior to further vertical construction.

Paperwork is Important for Owners



Important

Information

Lowest Floor means the lowest floor of the lowest enclosed area (including basement). An unfinished or flood-resistant enclosure (that is not a basement) is not the lowest floor if the enclosure is limited to parking, limited storage, and building access ([see page 45](#)) and it is built as required by local floodplain management ordinances.

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.

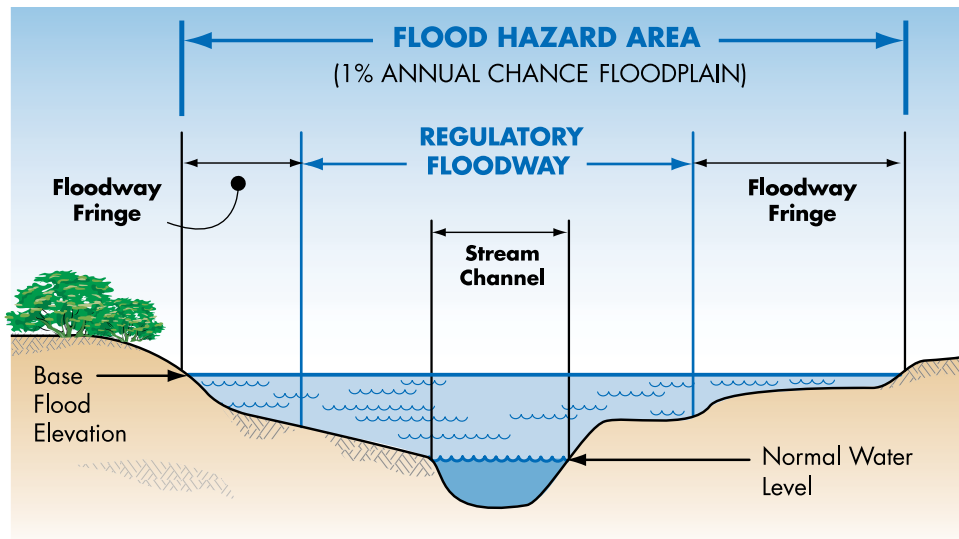
“As-built” Elevation Certificates should be submitted before the final inspection. Surveyors collect information helpful to verify compliance, including flood openings and elevation of equipment.

THE RIVERINE FLOODPLAIN & FLOODWAY

- 27** Understanding the Riverine Floodplain
- 28** Understanding the Regulatory Floodway
- 29** The FEMA Regulatory Floodway & No-Rise Certification



Understanding the Riverine Floodplain



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



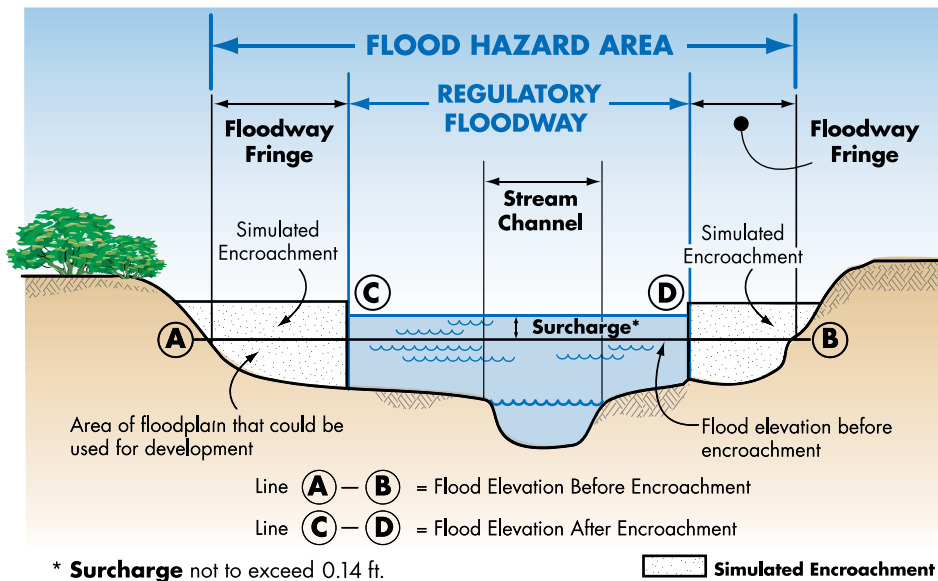
Terms and Definitions

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

[See page 28](#) to learn about the regulatory floodway, which is the area of the SFHA where flood waters usually are deeper and flow faster.

[See page 13](#) to learn about coastal floodplains in Lake, LaPorte, and Porter counties.

Understanding the Regulatory Floodway



Terms and Definitions

The **Regulatory 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 obtain a Construction in Floodway permit from IDNR ([see page 30](#)). Experienced registered professional engineers must make sure proposed projects either won't increase flooding or that any increases do not impact structures on other properties.

The FEMA Regulatory Floodway & No-Rise Certification

- Floodways convey the largest volume of water and may have high velocities.
- Development is more restricted in regulatory floodways.
- Development is not allowed unless IDNR issues a Construction in a Floodway permit, construction authorization, or the project qualifies for an exemption.
- Development is not allowed in floodways mapped on FEMA FIRMs unless certified to cause “no-rise” (no increase) in BFEs or a CLOMR/LOMR is obtained ([see page 22](#)).
- Engineers may be required to prepare floodway encroachment analyses to evaluate the hydraulic impact of proposed development.
- Floodway encroachment analyses must be based on technical data obtained from FEMA.
- “No-rise” certifications must be signed, sealed, and dated by a Professional Engineer licensed in the State of Indiana and qualified to conduct hydraulic analysis.

XYZ Engineering, Inc., IN

Mr. Floodplain Manager
1000 Main Street
IN

Re: 1200 Jackson Street

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

A.J. Smith P.E.



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

PERMITTING DEVELOPMENT

- 30** Indiana Division of Water Regulatory Permit Program
- 31** Indiana Waterways Inquiry Request
- 32** Development in SFHAs Requires Local Permits and Approvals
- 33** Some Key Floodplain Development Permit Review Steps
- 34** Carefully Complete the Permit Application
- 35** Communities Must Retain Flood Records Permanently



Indiana Division of Water Regulatory Permit Program

Flood Control Act (IC 14-28-1)

The State regulates development in the floodway, requiring IDNR approval for all types of construction, excavation and filling (does not replace local permits). Construction of new residential structures (abodes) on new sites or conversion of nonresidential structures to residential use are not permitted except in the Ohio River floodway and one section of the Patoka River floodway. There are limitations on improvements and additions to existing residences.

Floodplain Management Rules (312 IAC 10)

- IDNR authority in floodways is limited to sites with upstream drainage areas that are greater than one square mile.
- The rules establish criteria for project performance standards.
- The rules contain general license criteria for utility line crossings, wetland restoration, logjam removal, outfall projects, prospecting, and more.

IDNR approval, in addition to local permits, is also required for specific development activities under the following statutes and rules:

- Lake Preservation Act (IC 14-26-2 and 312 IAC 11)
- Lowering of the Ten Acre Lake Act (IC 14-26-5)
- Navigable Waters Act (IC 14-26-1 and 312 IAC 6)
- Sand and Gravel Permits Act (IC 14-29-3)
- Construction of Channels Act (IC 24-29-4)

Find links to statutes, rules, permitting information, forms, instructions, resources, and permit fees at
<https://www.in.gov/dnr/water/regulatory-permit-programs/>.

Instructional videos explain completing permit applications, fulfilling public notice requirements, and providing documentation necessary to obtain IDNR approval.

Indiana Waterways Inquiry Request

Indiana waterways are important natural resources for citizens of Indiana. IDNR and the Indiana Department of Environmental Management (IDEM) implement State and Federal laws to protect the natural resources and scenic beauty of our waterways.

IDNR and IDEM partnered to create the Indiana Waterways Inquiry Request tool to help users determine when or if they need permits to complete proposed projects. It relates to:

- Section 404 Water Quality Certifications
- Isolated Wetlands Permits
- Construction in a Floodway Permits
- Other construction along streams, lakes, and dams



Access the Waterways Inquiry Request tool at www.waterways.in.gov. Look for full instructions, an instruction video, helpful tips, quick links to application forms and the Waterways Permitting Handbook.

Development in SFHAs Requires Local Permits and Approvals

- Construction of new buildings
- Improvements and renovations of buildings
- Renovation of building interiors
- Repair of damaged buildings
- Placement of manufactured (mobile) homes
- Subdivision of land
- Construction or placement of temporary buildings and accessory structures
- Construction of agricultural buildings
- Construction of roads, bridges, and culverts
- Construction and reconstruction of boat lifts, docks, piers, and seawalls
- Placement of fill, grading, excavation, mining, and dredging
- Alteration of stream channels
- Wind and solar farms



Important

Information

Development does not include activities such as the maintenance of existing structures and facilities (e.g., painting, re-roofing, resurfacing roads) or gardening, plowing, and similar agricultural practices that do not involve filling, grading, excavation, or the construction of permanent structures.

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.

Some Key Floodplain Development Permit Review Steps

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

- Is the site near a watercourse?
- Is the site in the mapped flood zone or floodway?
- Is an IDNR Floodplain Analysis and Regulatory Assessment (FARA) required?
- Are applicants advised that other State or Federal permits must be obtained before work starts?
- Is the site reasonably safe from flooding?
- Does the site plan show the flood zone, Base Flood Elevation and building location?
- Is substantial improvement or repair of substantial damage proposed?
- Is an addition proposed?
- Will new buildings and utilities be elevated properly?
- Will manufactured homes be 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?

Review Checklist

- ☒ Floodplain
- ☒ Floodway
- ☒ FPG
- ☒ IDNR FARA
- ☒ New Construction
- ☒ Improved Existing Bldg.
- ☒ Elevated
- ☒ Elevation Certificate
- ☒ Issue Permit

Robert Penner, CPM

Carefully Complete the Permit Application

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

Application No.: 2025-12 Date Filed: 3/24/2025

Applicant: David and Sally Jones

Is proposed development: ☐ New construction. ☐ Substantial modifications.

☒ Other (describe): fill and grading

Property located in Zone AE on FIRM dated: 12/19/2014

Location is: ☐ Floodway/Fringe not determined. ☒ Fringe. ☐ Floodway.

Applicant must notify IDNR, with site plans, if in Floodway or undetermined floodplain areas. Attach copy of IDNR permit or floodplain analysis and regulatory assessment (FARA; e-FARA).

Base Flood Elevation (BFE) at site: 759 NAVD

Flood Protection Grade (FPG) at site: 761 NAVD

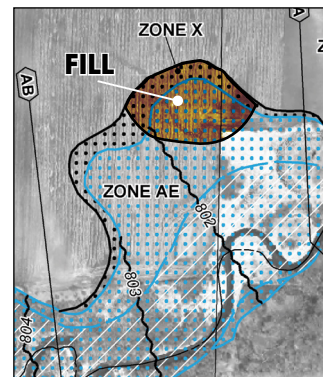
Approved by: Robert Reimer Title: building official



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 or engineering department for application forms and guidance.

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
- Floodplain Analysis and Regulatory Assessments (FARA) issued by IDNR Division of Water
- 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



Important

Information

Maintaining permanent records allows communities to respond to citizen inquiries and to provide documentation to FEMA and IDNR as part of community audits.

REQUIREMENTS FOR NEW DEVELOPMENT

- 36** Avoid SFHAs When Possible
- 37** Fundamentals of Flood Resistant Construction
- 38** Indiana Building Codes Include Flood Requirements
- 39** Floodplain Analysis & Regulatory Assessment (FARA)
- 40** Freeboard: Build Higher, Reduce Damage, Save on NFIP Insurance
- 41** How to Elevate Buildings in Flood Zone A/AE
- 42** Placement and Compaction of Fill in Zone A/AE
- 43** Fill Can Adversely Affect Floodplain Functions
- 44** Basements in Flood Zones Are Unsafe
- 45** Enclosures Below the Lowest Floor in Zone A/AE
- 46** Crawlspace Details with Flood Openings in Zone A/AE
- 47** Utility Service and Equipment Inside Enclosures
- 48** Utility Service, Equipment, and Tanks (Outside)
- 49** Manufactured Homes Require Special Attention
- 50** Recreational Vehicles
- 51** Accessory Structures
- 52** Pools in Flood Hazard Areas
- 53** Solar Power Facilities and Solar Panels in Flood Hazard Areas
- 54** General Requirements: Coastal High Hazard Areas in Zone V
- 55** How to Elevate Buildings in Flood Zone V
- 56** The Zone V Design Certificate
- 57** Enclosures Below the Lowest Floor in Zone V
- 58** Variances From Floodplain Management Requirements

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.

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** high enough to prevent floodwater from entering during the base flood event
- **Equipment and utilities** elevated or designed to remain intact and be restored easily
- **Enclosures below elevated floors** limited to parking, limited storage, and building access and designed to minimize damage
- **Flood damage-resistant materials** used below elevated lowest floors



Important

Information

Many Indiana communities require critical facilities to be located outside of SFHAs. When alternative sites are not available, critical facilities should be elevated higher than the Flood Protection Grade (FPG), [see page 39](#).

In short ... flood resistant buildings!

Indiana Building Codes Include Flood Requirements

Communities may incorporate by reference the building codes developed by the Indiana Fire Prevention and Building Safety Commission. The Indiana Building Codes are based on the International Codes. The codes include flood provisions that meet or exceed the NFIP requirements for buildings and structures.

- **Indiana Building Code:** Applicable to buildings other than one- and two-family dwellings, the flood provisions are primarily in Section 1612 Flood Loads, which refers to the standard *Flood Resistant Design and Construction* (ASCE 24).
- **Indiana Residential Code:** Flood provisions are primarily in Section R322 Flood-Resistant Construction, although there are requirements in several other sections.



Important

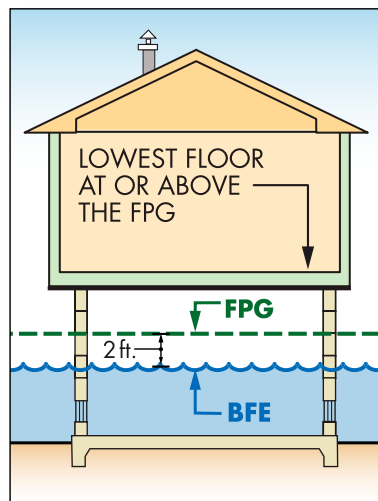
Information

The codes use the term design flood elevation. In Indiana, that is the Flood Protection Grade (FPG) or the Base Flood Elevation plus two feet.

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.

Floodplain Analysis & Regulatory Assessment (FARA)

Many special flood hazard areas are shown on FEMA FIRMs without BFEs and/or without the delineated floodways. For sites with an upstream drainage area greater than one square mile, Floodplain Analysis and Regulatory Assessments (FARAs) can be generated for most streams using the Indiana Floodplain Information Portal. The FARA results provide the elevation of the regulatory flood, also called BFE, and floodway limits used for regulatory purposes.



Communities use the FARA results to identify the State's jurisdiction and establish BFEs for sites. This helps ensure development, including buildings, is permitted in accordance with local ordinances. The FARA results can also be used to support Elevation Certificates, requests for FEMA Letters of Map Change, and flood insurance determinations required by mortgage lenders.

Open the Indiana Floodplain Information Portal at <https://infip.dnr.in.gov>. Follow the detailed instructions to create a FARA. For assistance, call the Division of Water at 317-232-4160, option 1.



Terms and Definitions

Flood Protection Grade is the elevation of the regulatory flood plus two feet at any given location in the Special Flood Hazard Area.

Regulatory flood means the flood having a one percent (1%) chance of being equaled or exceeded in any given year, as calculated by a method and procedure that is acceptable and approved by the IDNR and FEMA. The "Regulatory Flood" is also known as the "Base Flood," the "One-Percent Annual Chance Flood," and the "100-Year Flood."

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.

- Indiana requires at least 2 feet of freeboard ($FPG = BFE + 2 \text{ ft.}$).
- 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

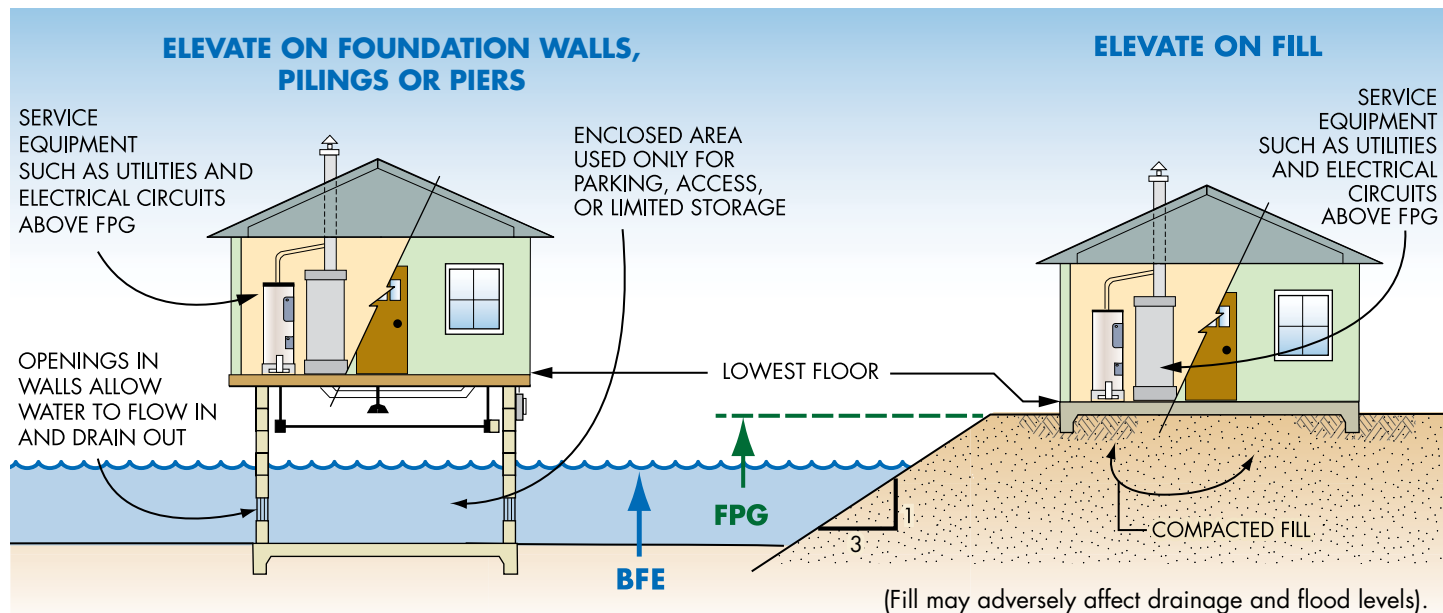
Information

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.

How to Elevate Buildings in Flood Zone A/AE



CAUTION! Enclosures (including crawlspaces) have some specific requirements ([see page 45](#)).

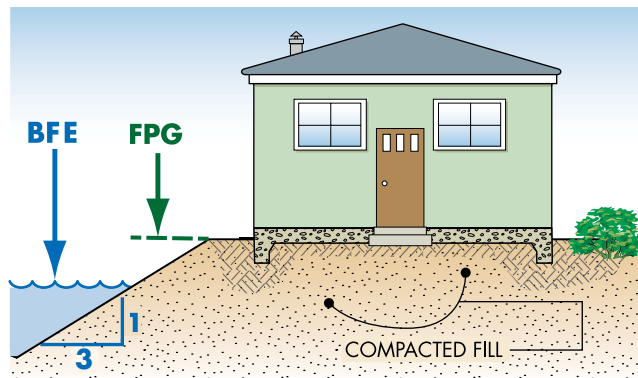
Note: When the walking surface of the lowest floor is at the FPG, under-floor utilities are not allowed.

Fill used to elevate buildings must be placed properly ([see page 42](#)).

Placement and Compaction of Fill in Zone A/AE

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

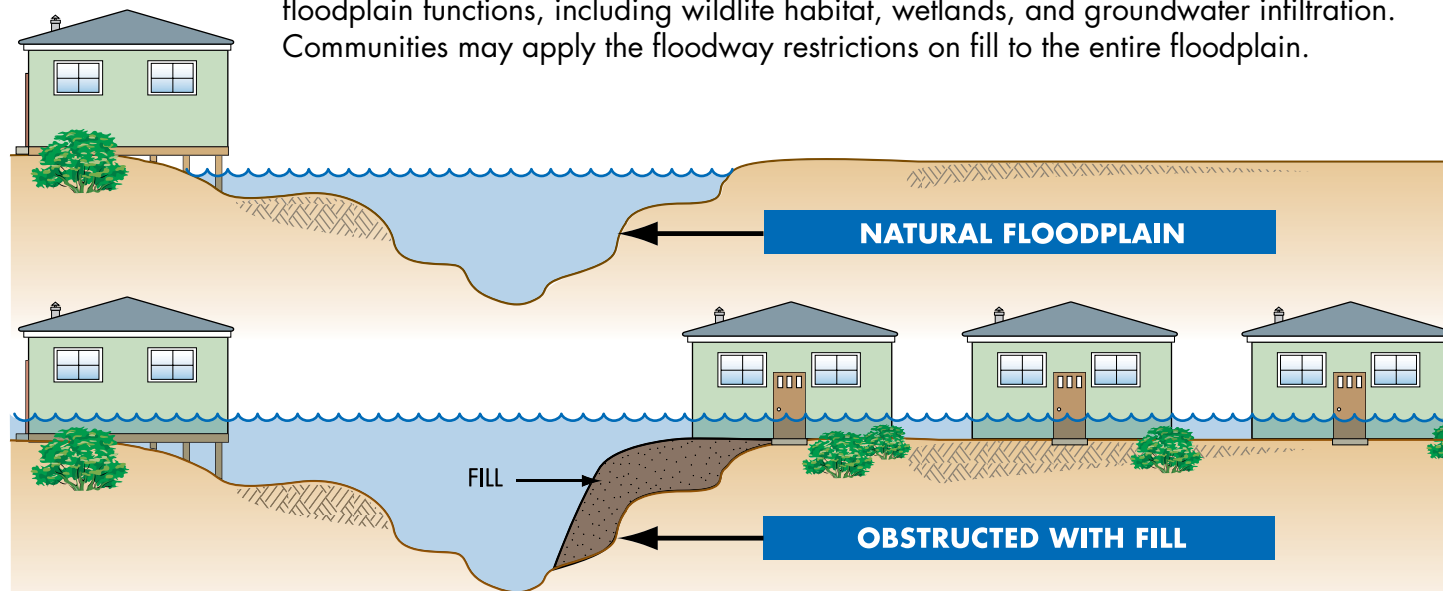
- Not be placed in areas with poor drainage or where the fill may divert water onto adjacent properties. Instead, use perimeter walls, piers, columns, or pilings to minimize drainage problems.
- Be good clean soil, free of large rocks, construction debris, and woody material (stumps, roots)
- Be machine-compacted to 95 percent of the maximum density (determined by a design professional)
- Have graded side slopes that are not steeper than 3:1 (one foot vertical rise for every 3 feet horizontal extent); flatter slopes are recommended
- Have slopes protected against erosion (vegetation for “low” velocities, durable materials for “high” velocities – determined by a design professional)
- Avoid the floodway ([see page 28](#))



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.

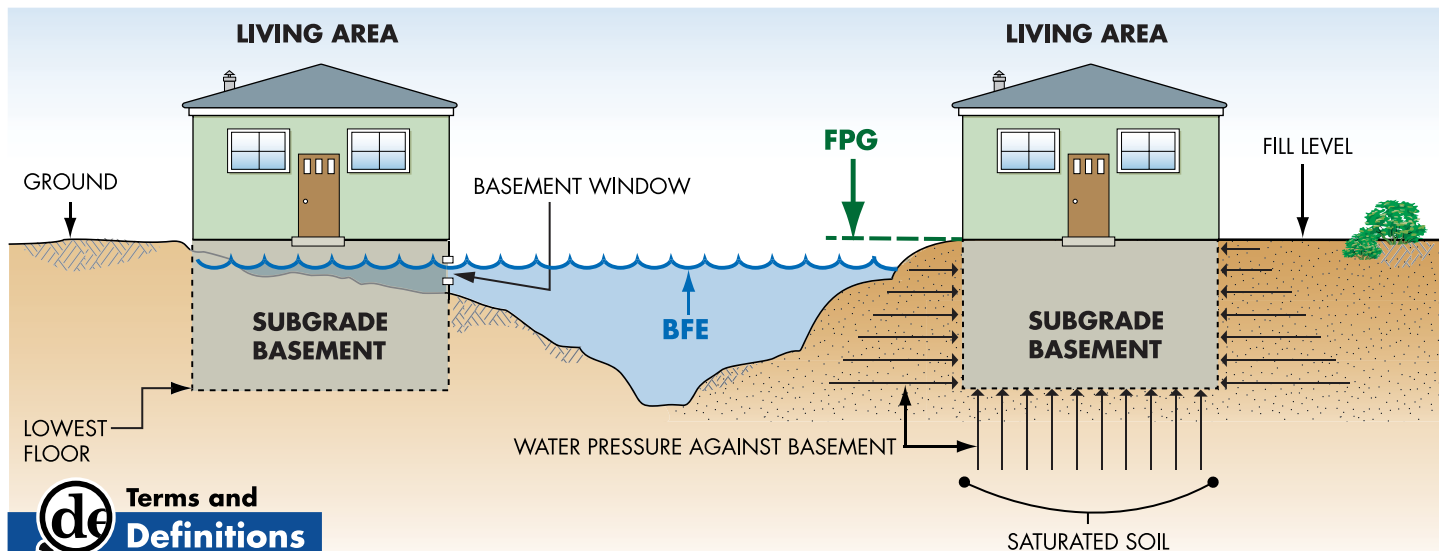
Fill Can Adversely Affect Floodplain Functions

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



A Construction in a Floodway permit from the IDNR Division of Water is required to place fill in a floodway.

Basements in Flood Zones Are Unsafe



Terms and Definitions

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

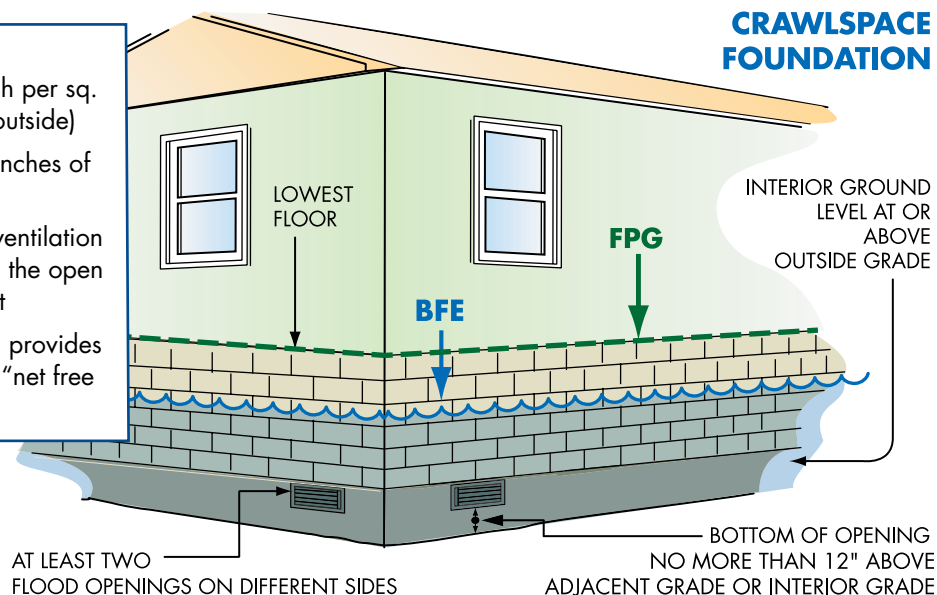
New buildings in floodplains are not allowed to have basement floors below the FPG and NFIP flood insurance coverage is very limited in existing basements. It only takes an inch of water over a door threshold or window sill and the entire basement fills up! Excavating a basement into fill doesn't always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

Enclosures Below the Lowest Floor in Zone A/AE

NOTE:

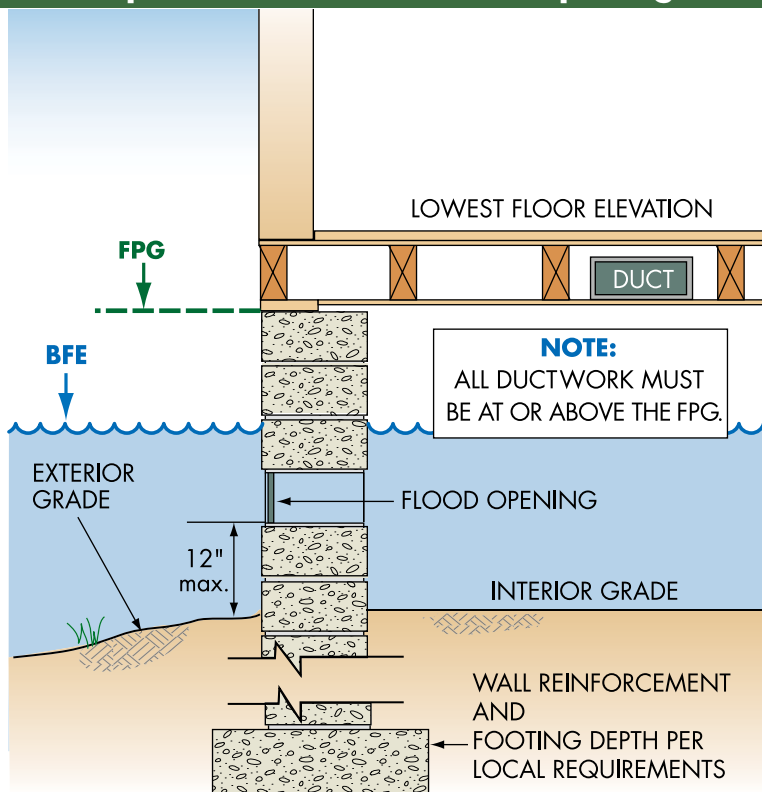
- Total net area of all openings is 1 sq. inch per sq. foot of enclosed area (measured on the outside)
- A 30' x 40' enclosure needs 1,200 sq. inches of net opening
- If inserted in flood openings, typical air ventilation units must be **permanently** disabled in the open position to allow water to flow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

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



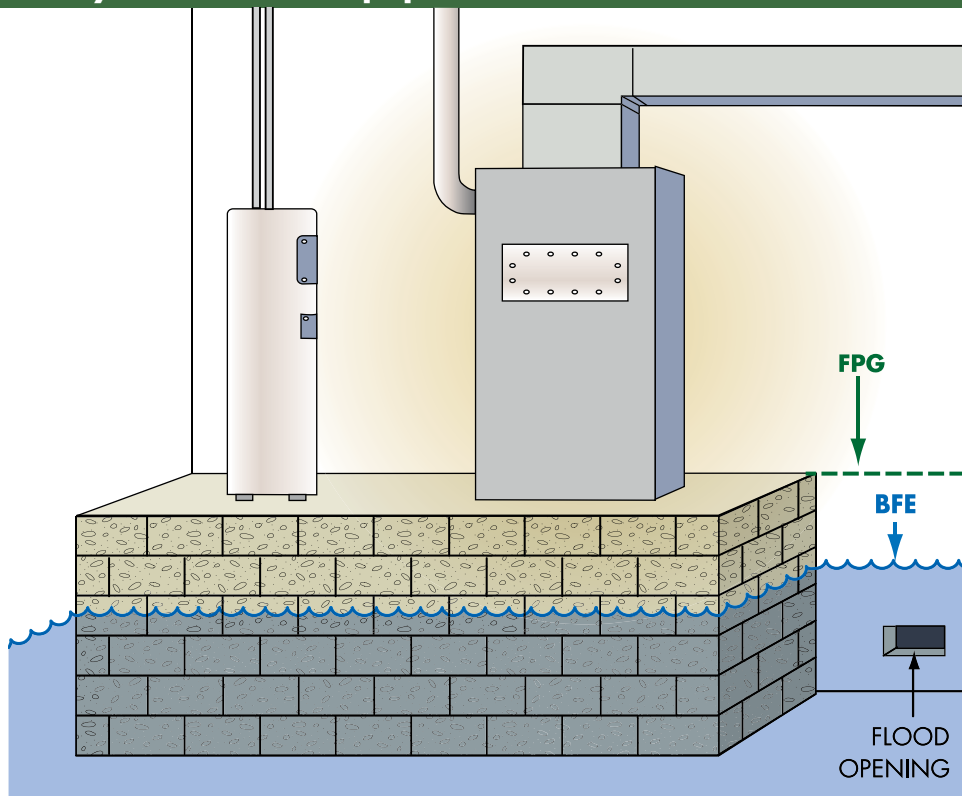
Solid perimeter wall foundations can enclose floodprone space. A crawlspace is a good way to elevate a few feet. The following are required: flood openings, elevated utilities, flood damage-resistant materials, and limitations on use. See NFIP Technical Bulletin #1 *Requirements for Flood Openings in Foundation Walls and Walls of Enclosures* and Technical Bulletin #2 *Flood Damage-Resistant Materials Requirements*.

Crawlspace Details with Flood Openings in Zone A/AE



- The Lowest Floor must be at or above the Flood Protection Grade (BFE + 2 ft).
- All materials below the FPG must be flood resistant.
- Flood openings must provide 1 sq. in. of net open area for every sq. ft. of area enclosed by the perimeter walls – or certified engineered openings may be used.
- A 30' x 40' enclosure needs 1,200 sq. in. of net opening (non-engineered).
- The bottom of flood openings must be no more than 12 inches above the higher of the interior and exterior grades.
- Standard air ventilation units must be permanently disabled in the "open" position to allow water to flow in and out.
- Interior grade must be equal to or higher than exterior grade on at least one side.

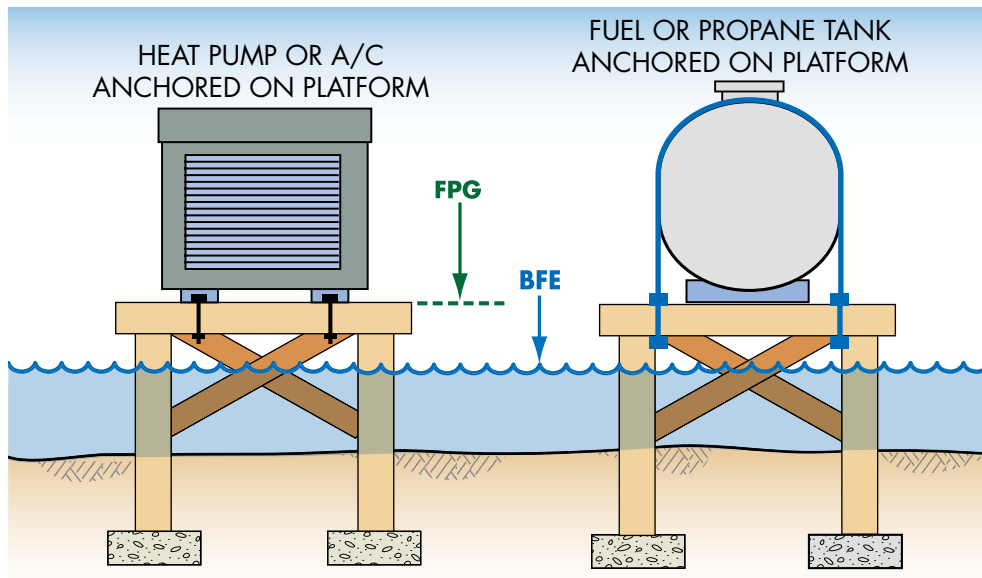
Utility Service and Equipment Inside Enclosures



Equipment installed in enclosures below elevated buildings, including ductwork, must be elevated to or above the FPG. 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.

Minimal electric service (light switch) necessary for safety is acceptable below the FPG but should be on a separate branch circuit with ground-fault circuit interrupter protection.

Utility Service, Equipment, and Tanks (Outside)



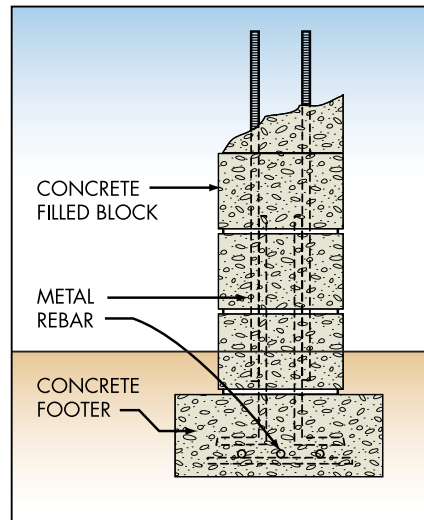
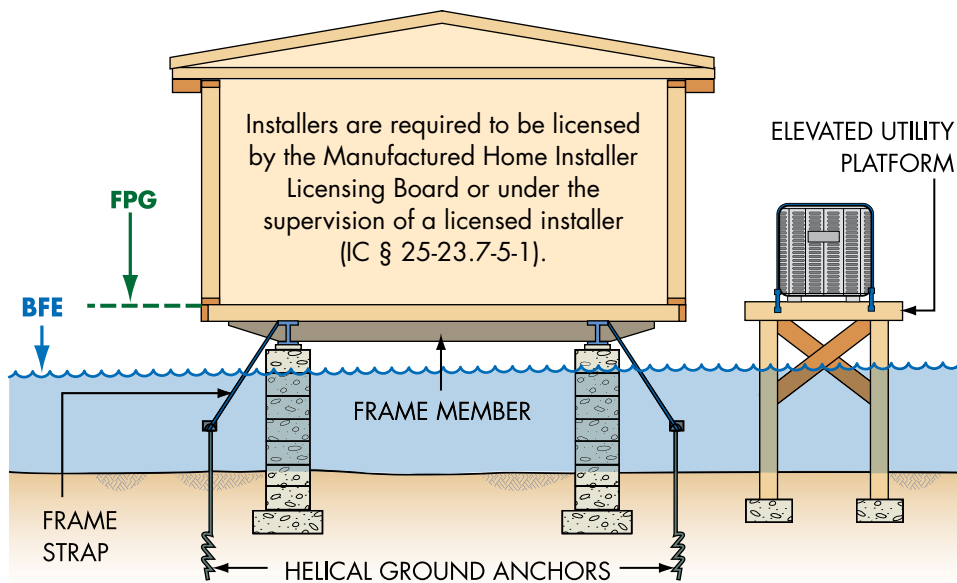
Important

Information

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

Fuel and propane tanks can pose serious threats to people, property and the environment during flood conditions. Search online for videos on anchoring fuel tanks in floodplains.

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*.

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)
- Have inflated tires and be self-propelled or towable by a light-duty truck
- Have no attached deck, porch, shed, or utilities
- Be used for temporary recreational, camping, travel or seasonal use (no more than 180 consecutive days)
- Have quick-disconnect sewage, water and electrical connectors



Important

Information

Camping near the water?

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

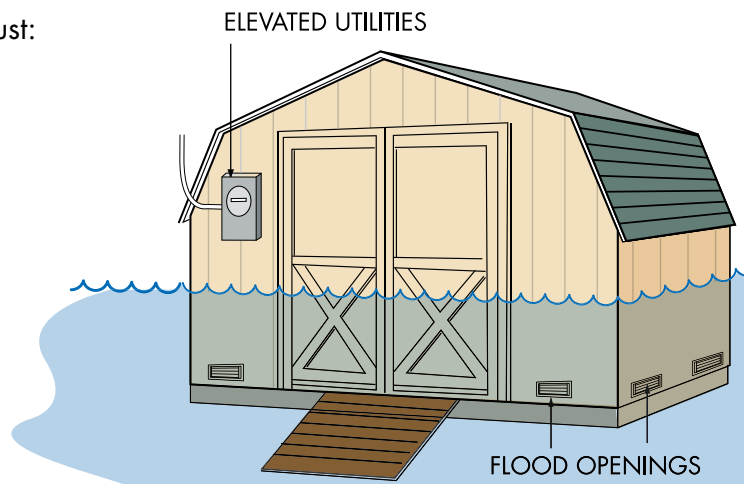
RVs that do not meet these conditions must be installed and elevated like manufactured homes, including permanent foundations and tie-downs ([see page 49](#)).

Accessory Structures

If not elevated, accessory structures in flood zones must:

- Be less than 400 sq. ft. in floor area
- 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

Examples of accessory structures are detached garages, carports, storage sheds, pole barns, and hay sheds.



Even small buildings are “development” and permits or variances with noted conditions are required.
They must be elevated or anchored and built to resist flood damage.

Caution! Remember, everything inside will get wet when flooding occurs.

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** ([see page 28](#)) and **riverine flood hazard area with BFEs but no floodway**, prior written authorization from IDNR is required. When a floodway is not delineated, obtain floodway limits by generating a FARA ([see page 39](#)).
- **Flood Fringe** ([see page 27](#)), no additional requirements.

In addition:

- **Pool houses** used to store hazardous chemicals and/or those with floor area larger than 400 sq. ft. must be elevated at or above the FPG.
- **Pool controls and equipment** must meet the elevation requirements for utility service ([see page 48](#)).

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** ([see page 28](#)): If any portion is in the floodway, prior authorization from IDNR is required. When a floodway is not delineated, obtain floodway limits by generating a FARA ([page 39](#)).
- **Flood Fringe:** The structures are allowed in flood fringe areas if they are:
 - ❑ Designed to have solar panels, when fully tilted, above the FPG
 - ❑ Anchored to prevent flotation, collapse, or lateral movement during base flood conditions
 - ❑ Constructed with flood damage-resistant materials below the FPG

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

For guidance, download IDNR's Guidelines for Solar Panel Projects in the Floodplain from <https://www.in.gov/dnr/water/files/wa-water-FAQ-solar-panel.pdf>.


General Requirements: Coastal High Hazard Areas in Zone V

Revisions to Flood Insurance Rate Maps for the Lake Michigan shorelines of Lake, LaPorte, and Porter counties show coastal high hazard areas (Zone V).

The fundamental requirements for flood resistant construction ([page 37](#)) apply in Zone V and:

- Building foundations must be “open” (columns or piles) to allow waves and water to pass under without imposing significant wave forces ([see page 55](#)).
- The lowest horizontal structural member of the lowest floor must be elevated to or above the FPG (BFE + 2 ft.).
- Foundation designs must be prepared and certified by registered design professionals ([see page 56](#)).
- Walls of enclosures below elevated buildings must be designed to break away ([see page 57](#)).
- Utility service and equipment must be elevated, and tanks must be elevated or underground.

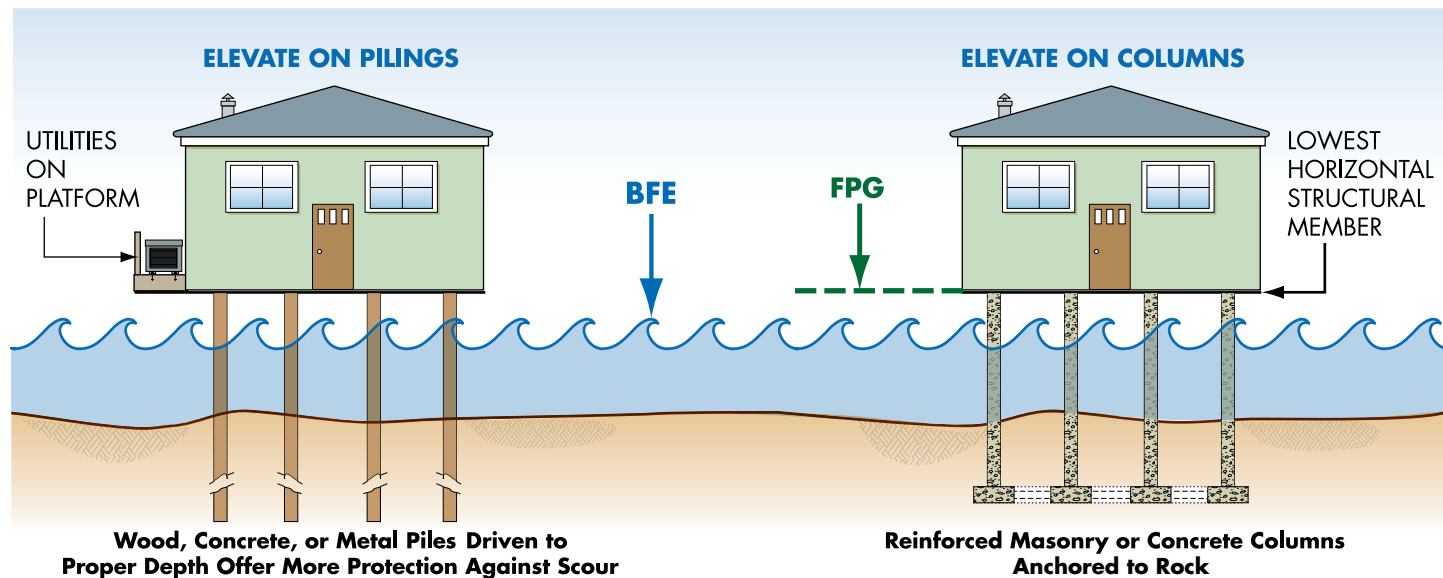
Some Zone A areas inland of Zone V may be subject to damaging waves and erosion. IDNR recommends buildings in these areas be designed and constructed according to the Zone V requirements.



Terms and Definitions

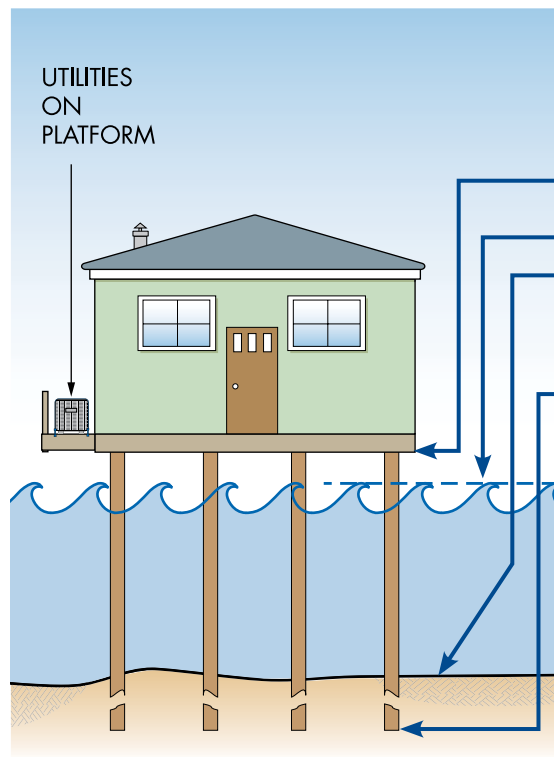
Coastal High Hazard Areas (Zone V) are shown on FIRMs to identify areas subject to high velocity wave action during base flood conditions. In Zone V, waves may be 3 ft. high or higher.

How to Elevate Buildings in Flood Zone V



In Zone V, the design specifics will be determined and certified 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 ([see page 56](#)). For more information, see FEMA P-499, *Homebuilder's Guide to Coastal Construction*.

The Zone V Design Certificate



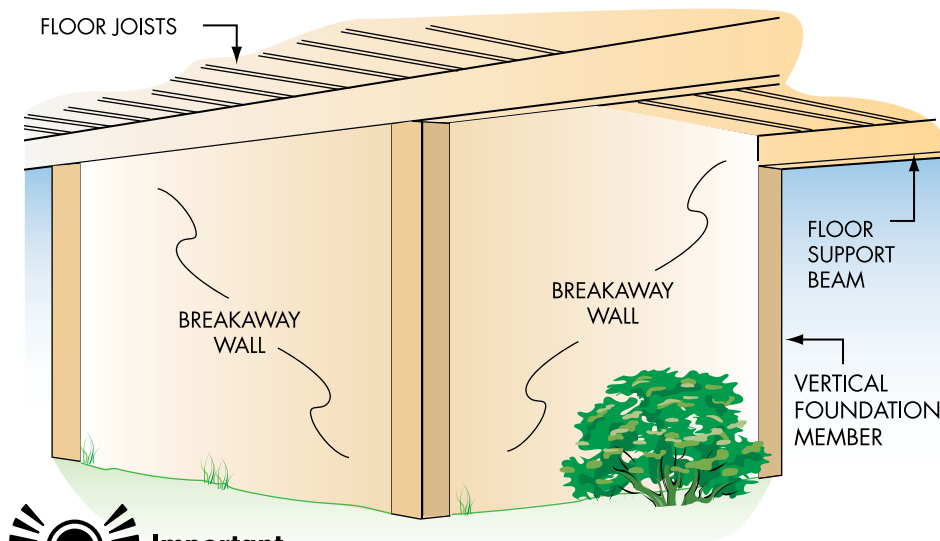
ZONE V DESIGN CERTIFICATE (Partial)

SECTION II: Elevation Information Used for Design

- 1 Datum..... ☐ NGVD ☒ NAVD ☐ Other
- 2 Elevation of the Bottom of Lowest Horizontal Structural Member 597 feet above datum
- 3 Base Flood Elevation (BFE)..... 595 feet above datum
- 4 Elevation of Lowest Adjacent Grade 590 feet above datum
- 5 Approximate Depth of Anticipated Scour/Erosion used for Foundation Design..... 1 feet
- 6 Embedment Depth of Pilings or Foundation Below Lowest Adjacent Grade..... 10 feet

An Indiana licensed engineer or architect must review and/or prepare the building design and complete a *Zone V Design Certificate* for any new construction, substantial improvement, or the repair of a substantially damaged structure.

Enclosures Below the Lowest Floor in Zone V



Important

Information

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

Enclosures under elevated buildings should be avoided. If small areas are enclosed:

- Walls must be designed to collapse or “break away” under flood conditions
- 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) is permitted

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.

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 policy holders even more.



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*.

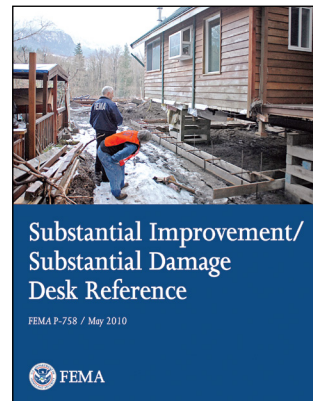
SUBSTANTIAL IMPROVEMENT & SUBSTANTIAL DAMAGE

- 59** Substantial Improvement/Substantial Damage Desk Reference
- 60** Answers to Questions about Substantial Improvement and Substantial Damage
- 61** What is Meant by Pre-FIRM and Post-FIRM?
- 62** Improvements and Repairs of Buildings in Flood Zones
- 63** Estimating Costs of Improvements and Repairs
- 64** Substantial Improvement: Renovation Only
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- 66** Substantial Improvement: Addition Plus Other Work
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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 to repair
- 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

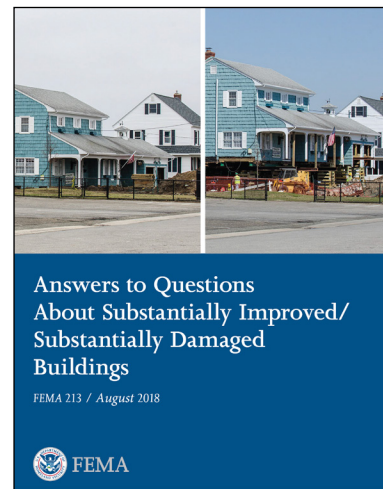
Substantial Improvement means any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds 50% of the market value of the structure before the "start of construction" of the improvement. The term includes structures that have incurred "substantial damage" from any cause, regardless of the actual repair work performed. The term does not include improvements of structures to correct existing violations of state or local health, sanitary, or safety code requirements. **Note:** Some Indiana communities have a threshold lower than 50% and some communities track improvements over a period of time, triggering compliance for repetitive flood damage, when the cumulative improvement value equals or exceeds 50%, or when a structure has been previously altered.

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



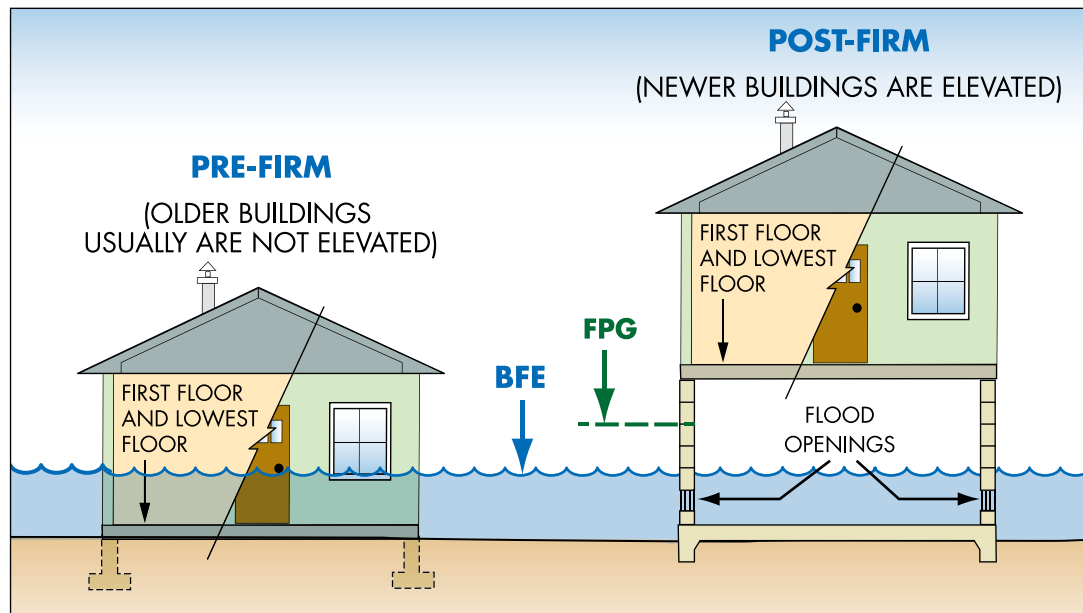
Terms and Definitions

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.

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

Pre-FIRM and **Post-FIRM** are NFIP insurance terms tied to a community's initial 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 new construction built 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.



Improvements and Repairs of Buildings in Flood Zones

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

- Review costs estimated in construction contracts or other cost estimates (including estimate market value of owner labor and donated labor and materials).
- Estimate the market value using property assessment records or use an independent assessment of market value performed by a licensed appraiser, including Actual Cash Value (in-kind replacement, depreciated).
- Compare the cost of improvements and costs to repair 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 repair of Substantial Damage).
- Encourage owners to consider other ways to reduce future damage if the comparison is less than 50% ([see page 71](#)).

Full compliance is required when destroyed buildings and demolished buildings are replaced (SI/SD determinations not required).



Important

Information

Improvements include:

- Renovation/rehabilitation of the interior of the existing building ([see page 64](#))
- Lateral addition, **without** renovation or structural alteration of the existing building ([see page 65](#))
- Lateral addition, **with** renovation or structural alteration of the existing building ([see page 66](#))
- Vertical addition (add new story)

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, and 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, and 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

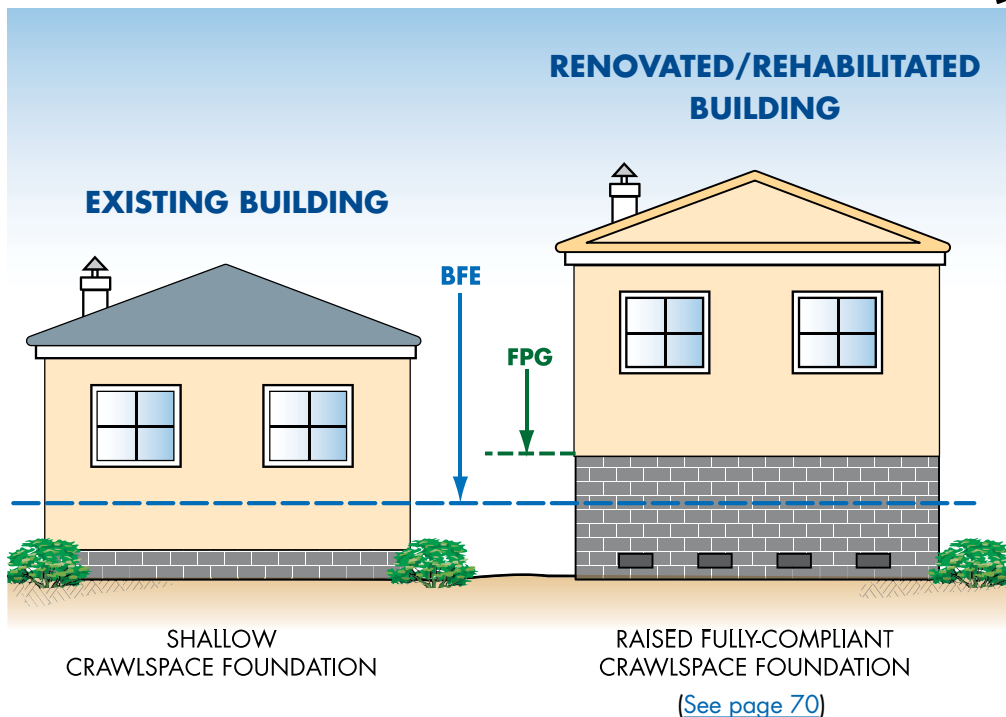
Written estimates prepared by contractors provide the best cost information.

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 59](#)).

Substantial Improvement: Renovation Only



Important

Information

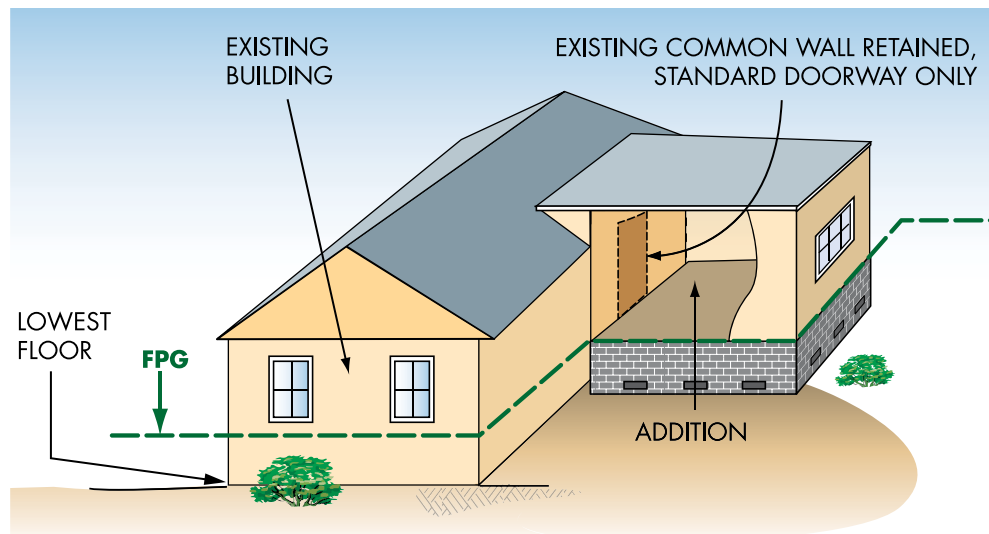
Buildings in SFHAs can be improved, renovated, rehabilitated or altered, but special rules apply.

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

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

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

Substantial Improvement: Lateral Addition Only



Important

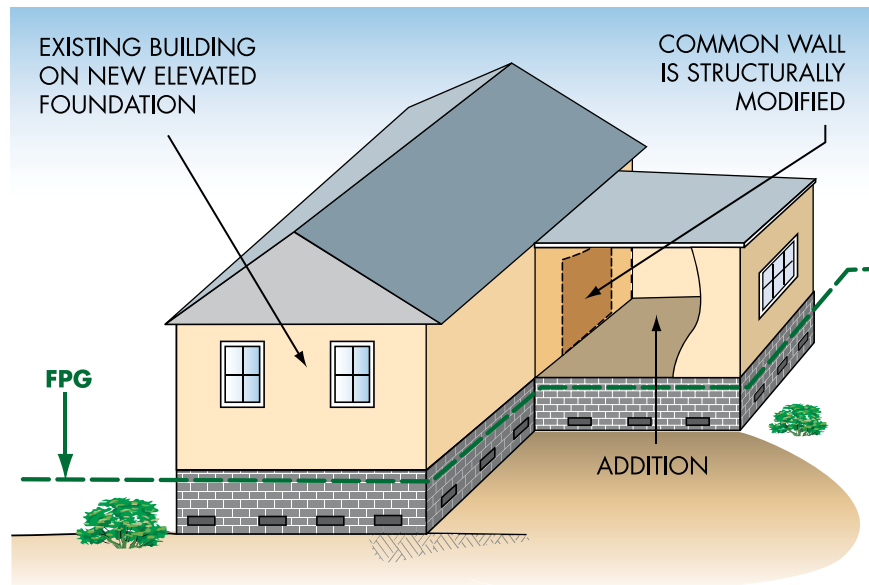
Information

See [page 66](#) for lateral additions that also modify the interior of the existing building or make structural modifications to the existing common wall.

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

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

Substantial Improvement: Addition Plus Other Work



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

- The work involves adding new top floors, modifying interiors of existing buildings, or structural modifications to existing common walls (for lateral additions); and
- The **cost of all proposed work plus the cost of improvements** equals or exceeds 50% of the market value of the existing building.

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

When Your Home or Business in the SFHA is Damaged

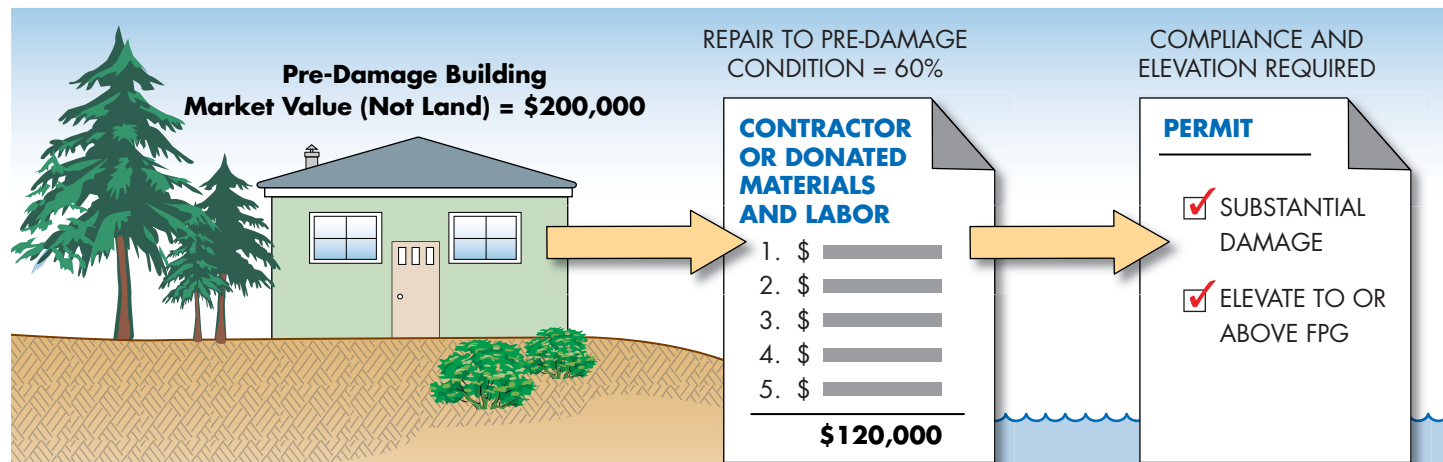
You must get a building permit from your community building department to make most repairs. When your home or business in the SFHA is damaged by any cause, your community will evaluate whether the building has been substantially damaged ([see page 69](#)).

- 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 60](#) for 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, or even vehicle impact. Detailed estimates of the cost to repair a building to pre-damage condition are required. If the costs are 50% or more of the pre-damage market value of the building, then it is **substantially damaged** and must be brought into compliance, which may involve raising the foundation and other measures. Consult with local permit offices before repairs are started.

[See page 70](#) for an example of elevating an existing building above a crawlspace.

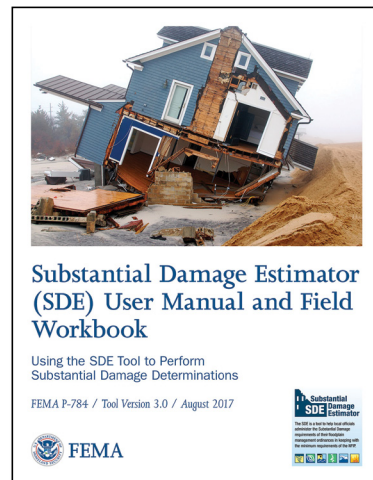
Estimating Substantial Damage

In addition to valuable advice for planning for and administering floodplain management requirements after floods, IDNR's "Post-Flood Guidance" includes a Depth-Damage Field Estimate worksheet based on the U.S. Army Corps of Engineers' depth-damage relationships.

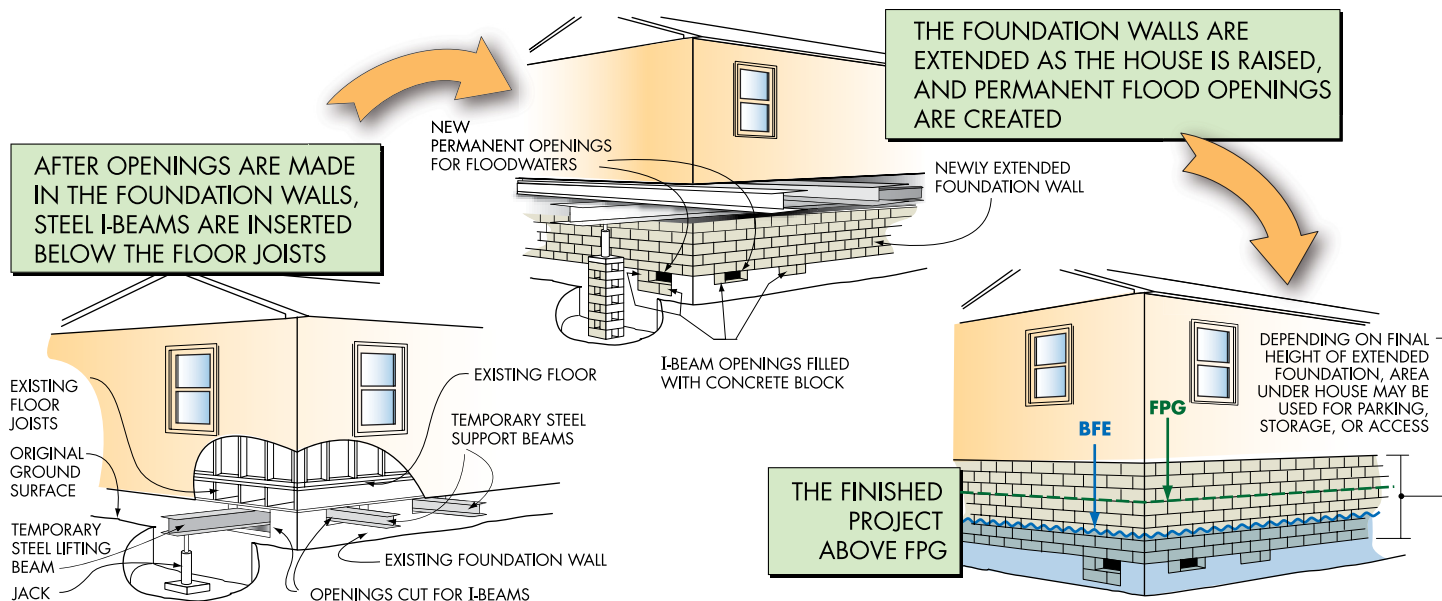
FEMA's Substantial Damage Estimator tool was developed to help state and local officials to collect uniform information needed to make substantial damage determinations for residential and nonresidential structures in accordance with local floodplain management requirements. The SDE tool:

- 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 Field Workbook, forms, worksheets, and other materials. Worksheets can be used to manually collect information, even when the software is not used.

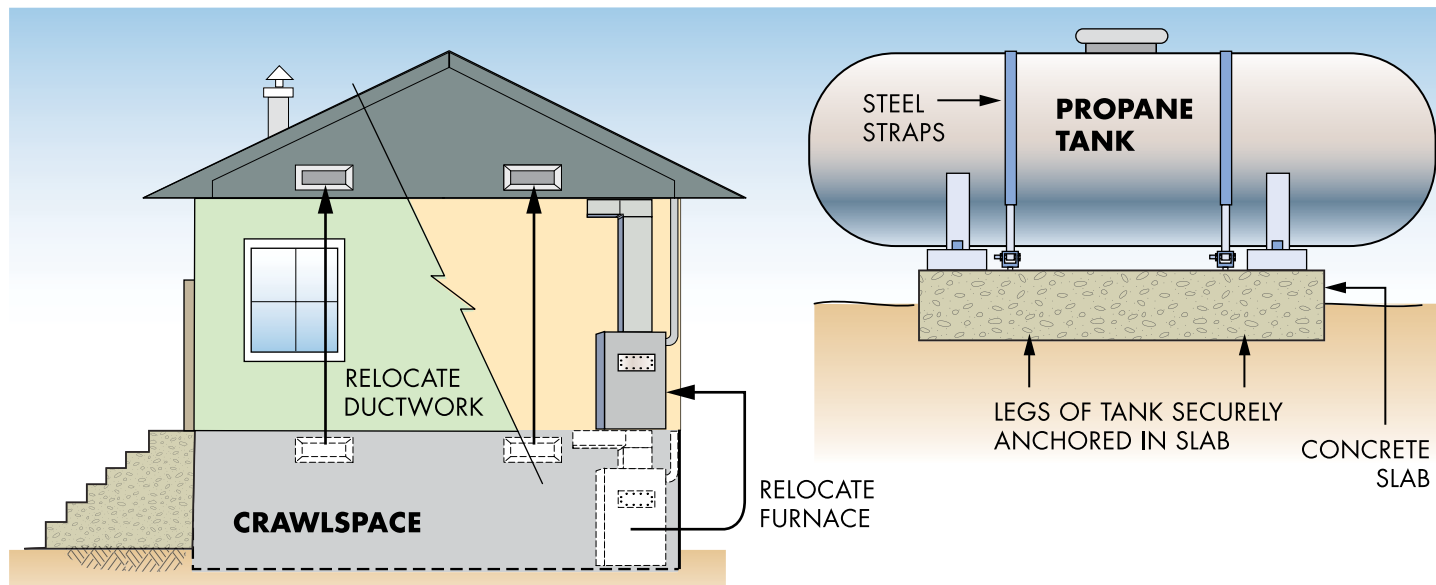


Elevating an Existing Building



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 74](#)).

Some Flood Protection for Older Homes is Easy and Low Cost



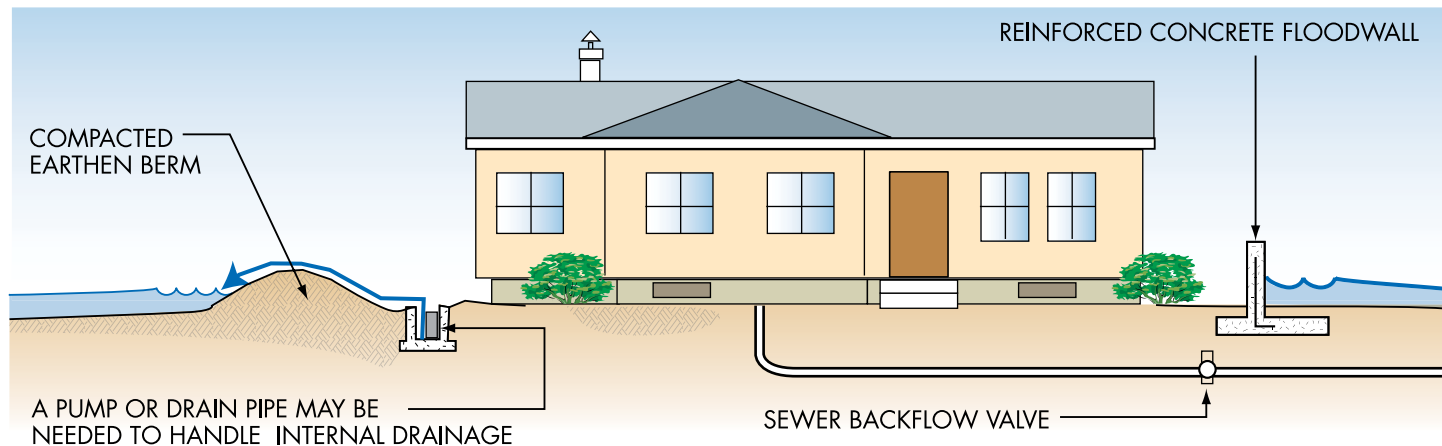
Move fuse boxes, water heaters, furnaces, and ductwork out of crawlspaces and basements.

Anchor heating oil and propane gas tanks to prevent flotation and lateral movement.

Do not store valuables or hazardous materials in a floodprone 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 individual buildings can be protected by earthen berms or concrete floodwalls. Permits are required for these protection measures and extra care must be taken if sites are in floodways ([see page 28](#)). Small berms or floodwalls cannot be used to achieve compliance for new construction, substantially improved buildings, or substantially damaged buildings.

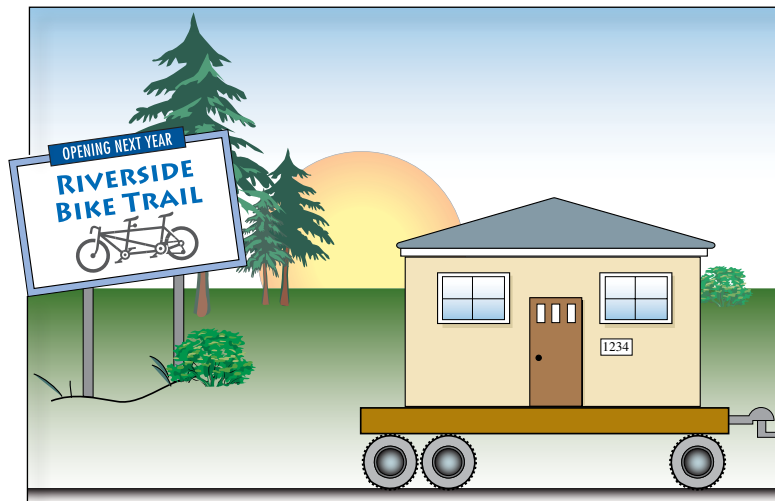
Important! These protective measures will not reduce your NFIP flood insurance premium!

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 Indiana Department of Homeland Security (IDHS) administers FEMA mitigation grant programs. Learn more at <https://www.in.gov/dhs/2402.htm>.

Paying for Post-Flood Compliance

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

- Buildings are located in a mapped flood zone
- Buildings are covered by NFIP flood insurance, which includes Increased Cost of Compliance (ICC) coverage
- Buildings have lowest floors below the BFE
- Buildings were substantially damaged **by flooding**
- Substantial damage may be one-time 50% or by repetitive flood damage in communities that enforce repetitive loss provisions
- Owners act quickly with their claims adjusters and community officials to process all required paperwork

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

Owners whose buildings are substantially damaged are required to bring the buildings into compliance with flood damage prevention ordinance requirements.

USE THE ICC CLAIM TO:



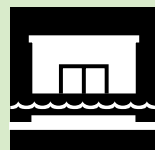
ELEVATE-IN-PLACE



RELOCATE TO HIGH GROUND



DEMOLISH



FLOODPROOF
(NON-RESIDENTIAL ONLY)

REMINDERS & RESOURCES

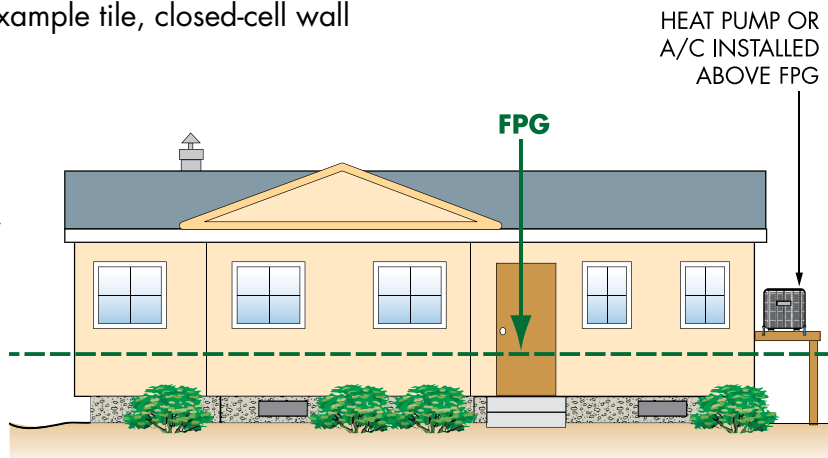
- 75** Non-Substantial Improvements
- 76** Floods Don't Always Stop at the BFE
- 77** Be Prepared for Flood Emergencies
- 78** StormAware: Turn Around Don't Drown®
- 79** Useful Resources and Common Acronyms
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Non-Substantial Improvements

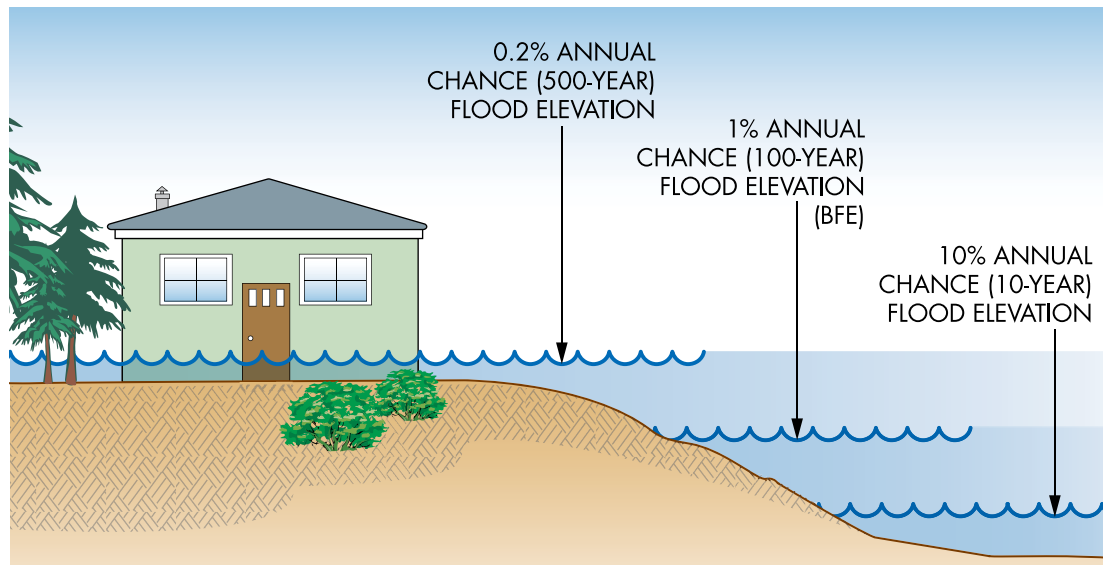
Proposed improvements are “non-substantial” if the costs are less than 50% of the market value of the building. In these cases, buildings are not required to be brought into compliance. However, there are many things owners can do to reduce exposure to future flooding. Owners should consider the following:

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



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

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 40](#) to see how this will minimize damage and may save on flood insurance premiums.

Be Prepared for Flood Emergencies

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

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

1

Create a
Plan

2

Prepare a
Kit

3

Listen for
Information

Learn more online at the American Red Cross www.redcross.org and the Indiana Department of Homeland Security www.in.gov/dhs.
Also check with local emergency management agencies.

StormAware: 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>.



Useful Resources and Common Acronyms

- Information for community officials and homeowners and related links: <https://www.in.gov/dnr/water/surface-water/indiana-floodplain-mapping/floodplain-management-and-homeowner-information/>
- The Indiana Floodplain Information Portal (INFIP) provides floodplain information for public use: infip.dnr.in.gov
- IDNR Permit Applications and Resources: in.gov/dnr/water/regulatory-permit-programs/
- IDNR Permit Exemptions: in.gov/dnr/water/regulatory-permit-programs/exemptions/
- IDNR and IDEM Permitting Determinations: in.gov/waterways
- NFIP Regulations, Title 44 CFR (look for Sec. 59.1 for definitions and Part 60 for criteria for land management and use): ecfr.gov/current/title-44/chapter-I/subchapter-B
- NFIP Technical Bulletins: <https://www.fema.gov/emergency-managers/risk-management/building-science/national-flood-insurance-technical-bulletins>
- CRS Resources: <https://www.fema.gov/floodplain-management/community-rating-system>

Common Acronyms

- BFE = Base Flood Elevation
- EC = Elevation Certificate
- FIRM = Flood Insurance Rate Map
- FPG = Flood Protection Grade
- 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 your local building or planning department.
- To learn more about flood maps, go to fema.gov/national-flood-insurance-program-flood-hazard-mapping.
- FEMA's online publications can be found in the FEMA Library (fema.gov/library) or by using an Internet search engine to search the publication number or title.
- To learn the importance of taking steps to financially protect homes and businesses from flood damage go to in.gov/floodinsurance or floodsmart.gov.
- To join the Indiana Association for Floodplain and Stormwater Management and see workshop, course, and conference opportunities, go to inafsm.org.
- Subscribe to the IDNR Division of Water newsletters at in.gov/dnr/water/publications/waterlines-newsletter/.
- Visit the Division of Water Events & Training website to register for upcoming trainings and view pre-recorded workshops at www.in.gov/dnr/water/events-and-training/.

Contact the IDNR, Division of Water, Floodplain Management Section at dowfpm@dnr.IN.gov.

Submit inquiries about IDNR waterways permits to water_inquiry@dnr.IN.gov.



This **Quick Guide** may be downloaded from



Indiana Department of Natural Resources

<https://www.in.gov/dnr/water/publications/> (see <Floodplain Management>)



Indiana Association for Floodplain and Stormwater Management

www.inafsm.org (see <Training & Resources>)