

Rebuilding Your Flood-Damaged House



FEMA

HURRICANES IRMA AND MARIA IN THE U.S. VIRGIN ISLANDS

Recovery Advisory 1, January 2018

Purpose and Intended Audience

The purpose of this Recovery Advisory is to provide information to assist with rebuilding decisions in the aftermath of Hurricanes Irma and Maria in 2017 as well as future flooding events. The 2017 hurricanes caused flooding in low-lying areas of the U.S. Virgin Islands, resulting in damage to houses, critical facilities, schools, and other buildings.

Homeowners impacted by the floods and rainfall are now faced with fundamental rebuilding decisions. The intended audience for this advisory is primarily homeowners, residential contractors, and designers.

Background

The U.S. Virgin Islands participates in the National Flood Insurance Program (NFIP). The current effective date of the FIRM is 2007.

The NFIP is a federal program that enables residents in participating communities to purchase flood insurance and requires communities to adopt and enforce minimum floodplain management standards.

For more information about NFIP regulations, FIRMs, flood insurance policies, and preparation and recovery during flood events, please see the official site of the NFIP and the FEMA U.S. Virgin Islands Facebook page in the Useful Links section at the end of this Recovery Advisory.

How to Determine Your Flood Risk

The FEMA Map Service Center, located at <https://msc.fema.gov/>, is FEMA's official public source for flood hazard information produced in support of the NFIP. You can use it to find your Flood Insurance Rate Map (FIRM). To view the effective FIRM for the U.S. Virgin Islands, use the Address Search feature, which allows you to search by a specific address or location.

When a new map is issued, or an effective map is revised, your mapped flood hazard, as well as your building or insurance requirements, may change. An effective FIRM is one that has been through a public review and appeal process and been adopted as a regulatory document. Therefore, it is important for users to check the Map Service Center or the local community map repository for current, effective information. Additional work is ongoing that may provide advisory data and maps for the disasters. Contact your local floodplain manager for more information.

Using the FIRM, you can determine your house's location relative to the SFHA. If your house is within the SFHA, you can utilize the FIRM to determine the base flood elevation (BFE) at or near your location rounded to the nearest foot, if these values are determined for your area. Many locations do not have a calculated BFE, and alternative methods can be applied to determine the elevation of the 1-percent-annual chance flood. Alternative methods may include obtaining flood elevation information from other federal agencies such as the US Department of Transportation and US Army Corps of Engineers for areas near federal projects, if available, consulting with a licensed surveyor or engineer, or contacting your local floodplain management officials for assistance. You can then compare your lowest floor elevations with the BFE and determine your risk of damage from flooding. If an Elevation Certificate was completed when your house was built, it may be on file at the U.S. Virgin Islands Department of Planning and Natural Resources (DPNR) office, and it will contain both the BFE and the lowest floor elevations for your house.

FEMA Flood Terminology

Base Flood: A flood having a 1 percent chance of being equaled or exceeded in any given year.

Base Flood Elevation (BFE): The elevation to which flood waters are anticipated to rise during the base flood.

Flood Insurance Rate Map (FIRM): The official map of a community on which FEMA has delineated the Special Flood Hazard Areas (SFHAs), the BFEs, and the risk premium zones applicable to the community.

Special Flood Hazard Area (SFHA): The land area covered by the floodwaters of the base flood. A structure located within the SFHA has a 26-percent chance of suffering flood damage during the term of a 30-year mortgage. Flood insurance is mandatory for properties located within the SFHA that receive federal financial assistance.

On a FIRM, Zones beginning with A or V are inside the SFHA, while Zones beginning with B, C, and X are outside the SFHA. It is important to note that even if your house is not located within the SFHA, there is still a possibility that your house will be subjected to flood damage, including catastrophic flooding. Figure 1 shows an example of a FIRM with arrows indicating pertinent information.

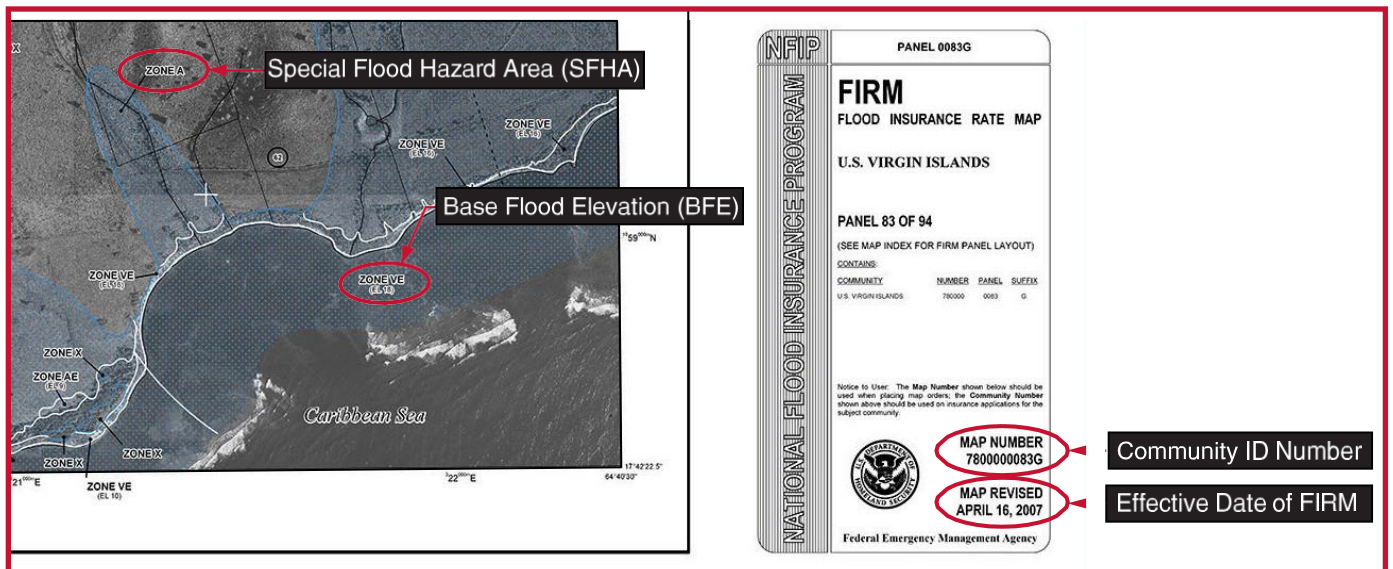
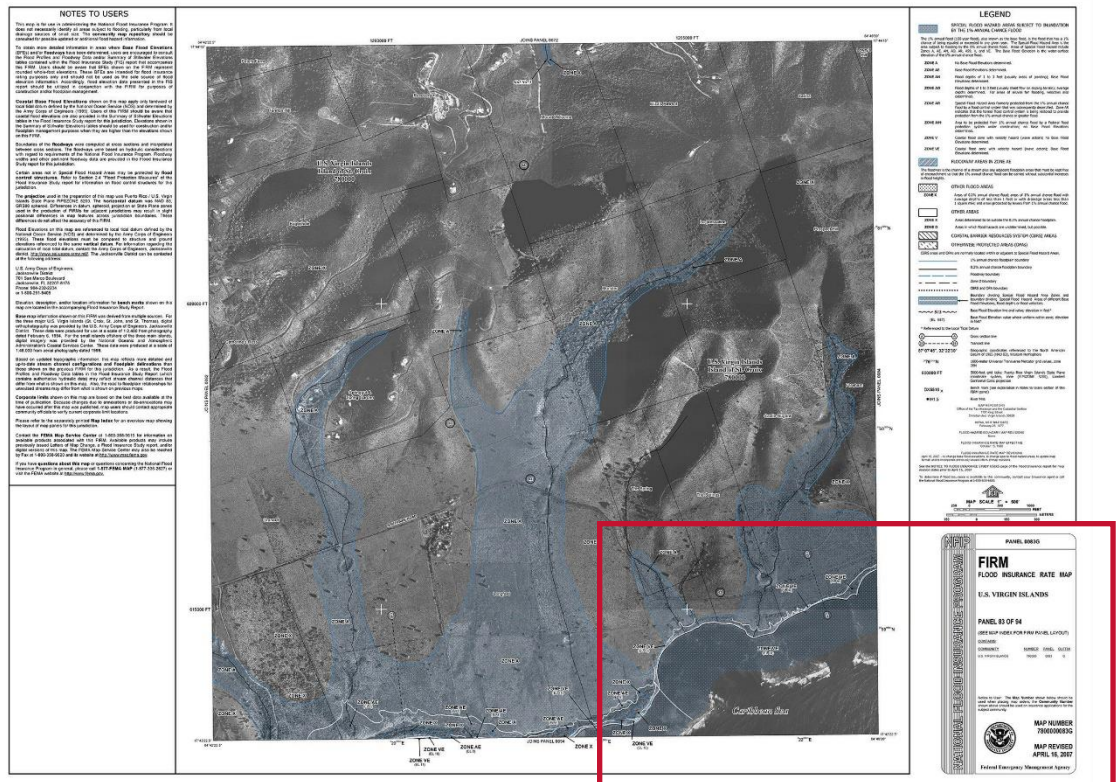


Figure 1. A FIRM panel illustrating information pertinent to the homeowner

NFIP Regulations That May Impact Your Decision to Rebuild

If your house was damaged during a flood and is located within the SFHA, you need to be aware of NFIP regulations related to the concepts of substantial improvement and substantial damage as you decide to rebuild.

Substantial Improvement: Substantial improvement means any reconstruction, rehabilitation, addition, or other improvement of a structure when the cost of the improvement equals or exceeds 50 percent of the market value of the building before the start of construction of the improvement. The term includes structures that have incurred substantial damage.

Floodplain management requirements for new construction apply to substantial improvements, and the structure must be brought into compliance with the local floodplain management standards. This can be done by elevating the structure, relocating the structure to an area outside of the SFHA, or demolishing the structure and rebuilding in compliance.

Substantial Damage: Substantial damage means damage of any origin sustained by a structure when the cost of restoring the structure to its pre-damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred. Substantial damage is determined regardless of the actual repair work performed. Local amendments, as provided in the U.S. Virgin Islands Building Code, may impact the methodology for calculating substantial damage; for example, they may lower the 50-percent threshold for substantial damage. (See the sidebar on the U.S. Virgin Islands Building Code and substantial damage determinations.)

The substantial damage determination will be made by your local floodplain manager, building official or the DPNR Commissioner, any of whom can help you decide the best options for rebuilding and provide specific details regarding local ordinance or code requirements.

Increased Cost of Compliance (ICC): ICC is a standard provision in flood insurance policies that pays the policyholder to comply with a state or local floodplain management law or ordinance affecting repair or reconstruction of a flood-damaged structure. The structure must meet certain eligibility criteria, including a substantial damage or repetitive loss determination by a local official. Mitigation activities eligible for payment include elevation, relocation, and demolition. Construction funded by ICC payments must be completed within 6 years of the substantial damage determination. ICC funds are available in addition to federal assistance provided to make your house more flood damage resistant.

Repetitive Loss Structure: A repetitive loss structure is an NFIP-insured structure that has had at least 2 paid flood losses of more than \$1,000 each in any 10-year period since 1978.

All projects that utilize FEMA funding must be compliant with the most recent national model building codes, in accordance with FEMA's Policy Memo *Disaster Risk Reduction Minimum Codes and Standards* (FEMA FP 204-078-2).

Options to Minimize Risk of Future Flooding When Rebuilding

Several options are available for protecting your house from future flood damage. Your local officials, DPNR staff, builders, and design professionals can help you choose the right option for your house. Some examples include the following:

Relocate to a Site Outside of the SFHA

If your house is structurally sound, it may be possible to move it to a higher elevation on the same lot or to another location outside of the floodplain.

Participate in a Buyout or Acquisition Program

Property acquisition is the most permanent form of flood hazard mitigation. It removes people and property from harm's way. In a property acquisition grant, the community buys private property, acquires title to it, and then clears it. By law, that property, which is now public property, must forever remain open space. The community can use it to

United States Virgin Islands Building Code

The U.S. Virgin Islands Building Code has unique, more restrictive language that may impact the substantial damage determination of structures.

If the cost of such changes or alterations or the amount of such damage indicated in the preceding sections is more than 25 percent but not more than 50 percent of the then value of the building as determined by the Commissioner, then only the portions to be changed or altered shall be made to conform to the requirements of this chapter for new construction (Title 29 of the U.S. Virgin Islands Code Chapter 5 Subchapter IX No. 3).

The U.S. Virgin Islands Code requires that existing buildings sustaining more than 25 percent but not more than 50 percent damage must repair that damage such that repaired portions meet the requirements of those mandated for new buildings.

Check with the DPNR for the latest in building code changes that may impact your project.

create public parks, wildlife refuges, etc., but cannot sell it to private developers or individuals or develop it.

Property acquisitions work the same way as any other real estate transaction. Property owners who want to sell their properties will be given a fair price. It is an opportunity for people who live in or near flood hazard areas to relocate to a safer location.

If you are interested in a buyout, you can contact the DPNR floodplain manager to see if a buyout program is available in your community.

Elevate the House

Elevating a house is one of the most common mitigation methods. When a house is properly elevated, the living area will be raised above the BFE and provide more resilience or safety. For example, you may choose to elevate to the BFE plus an additional factor of safety (see text box, “Increasing the Resilience of Your House”). Most houses can be elevated; however, the cost of elevation varies based upon multiple factors. Grants may be available to assist in the cost of elevation.

Although elevating a substantially damaged house can be expensive, it can also provide many benefits, such as reducing future flood damage, lowering your insurance premiums, adding value to the house, increasing usable space for parking or storage, improving the appearance of the house, helping protect contents, and reducing anxiety about future floods.

Prior to undertaking an elevation project, a registered design professional should evaluate the building to make sure that it is structurally sound for elevation. The floor system should be evaluated for any necessary retrofits, and the new foundation plans should be signed and sealed by the design professional. For more information regarding elevating your house, please refer to *Above the Flood: Elevating your Floodprone House* (FEMA P-347, 2000).

Protect the Utilities

Utilities in existing houses can often be effectively protected from flood damage. The easiest and most practical time to undertake this effort is during a renovation or repair project. If your house has been substantially damaged and/or is being substantially improved, the NFIP and current building codes require that utility systems be protected from future flood damage to the same criteria required for new construction. However, if your house has suffered less than substantial damage, you have the following two basic options for protecting utilities. Contact your local building official at the DPNR to determine if more stringent requirements for utilities are required at the time of replacement.

Elevate utilities: This option can protect you from the inconvenience and cost of repeated future flood damages and highly recommended by floodplain managers. For more information on protecting the utilities in your house, please refer to *Protecting Building Utilities from Flood Damage* (FEMA P-348, 2017).

Implement low-cost retrofits to utility systems: For a minimal additional cost, large benefits may be realized, especially when protecting from smaller future flooding events. For example, two short electrical panel boards can be elevated side-by-side versus one long panel that stretches from the floor to the ceiling.

Wet Floodproofing

For non-residential structures, accessory structures such as sheds, or structures that are not substantially damaged or improved but for which homeowners wish to reduce the likelihood of future damages, wet floodproofing may be an option. Wet floodproofing provides resistance to flood damage by allowing floodwater to enter the house. Allowing floodwater to enter portions of the house (such as a crawl space or unfinished basement) equalizes the interior and exterior pressures on the walls during a flood. Equalized pressures reduce the likelihood of structural damage during a flood event. For information on wet floodproofing your house, please refer to *Wet Floodproofing Requirements for Structures Located in Special Flood Hazard Areas in accordance with the National Flood Insurance Program* (TB 7-93, 1993). And, see Puerto Rico Recovery Advisory 4, *Best Practices for Minimizing Flood Damage to Existing Structures* (PR-RA4, 2018).

Increasing the Resilience of Your House

The FIRM establishes the BFE, which is the expected elevation of floodwater during the 1-percent-annual-chance flood event. To meet the criteria in the latest consensus building codes, you must elevate the lowest floor to the BFE plus one foot or the design flood elevation (DFE), whichever is higher. To achieve even more resilience, you should elevate the lowest floor to the BFE plus two feet, or higher. It is important that you contact your local floodplain management official at the DPNR, because he/she can tell you the locally mandated flood elevation, which may be higher. The higher you elevate above the BFE, the more likely you are to prevent future flood damages, which will lead to lower flood insurance premiums.

Floodproofing: Any combination of structural and non-structural additions, changes, or adjustments to structures that reduce or eliminate flood damage to structures and their contents.

References and Resources

References

29 U.S. Virgin Islands Code, Chapter 5. <https://www.lexisnexis.com/hottopics/vicode/>.

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FEMA. "FEMA Flood Map Service Center." <https://msc.fema.gov/>.

International Code Council (ICC). 2018b. *International Existing Building Code*. <https://codes.iccsafe.org/public/document/IEBC2018>.

U.S. Virgin Islands Department of Planning and Natural Resources (DPNR). "U.S. Virgin Islands Department of Planning and Natural Resources." VI.gov. <http://dpr.vi.gov>. Note, website was offline at time of publication. Contact by telephone, 340-774-3320.

Useful Links

Association of State Floodplain Managers (ASFPM). "Hurricanes Harvey, Irma & Maria News, Updates & Resources." <https://floods.org/?menuid=841>.

Federal Alliance for Safe Homes (FLASH). "Publications, Resources, and Programs." <http://flash.org/resources.php>

FEMA. "FEMA U.S. Virgin Islands." <https://www.facebook.com/FEMAUSVirginIslands>. Note, this Facebook page was created for the Hurricanes Irma and Maria recovery process and is regularly updated with useful information.

FEMA. "The National Flood Insurance Program." <https://www.fema.gov/national-flood-insurance-program>.

Insurance Institute for Business and Home Safety (IIBHS). "Flood Archives." <https://disastersafety.org/flood/>.

U.S. Virgin Islands Office of the Lieutenant Governor. "United States Virgin Islands Office of the Lieutenant Governor Osbert E. Potter." <http://ltg.gov.vi/>.

For more information, see the FEMA Building Science Frequently Asked Questions Web site at <https://www.fema.gov/frequently-asked-questions-building-science>.

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