

NFIP

New Hampshire's Floodplain Management Program

Fact Sheet #3

Preventing Common Building Violations

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According to a report that evaluated the National Flood Insurance Program (NFIP), it concluded that the most common types of violation were mechanical and utility equipment located below the base flood elevation (BFE) and flood openings that do not meet the NFIP requirements. These two types of violations accounted for 50.6 percent of the violations found within the report's sample assessment.

The report concluded that more education and outreach was needed to address these two common violations. Therefore, the purpose of the following information is to help explain the requirements and include references where more information can be found to help prevent these violations from continuing.

Flood Openings in Residential Structures

One of the main NFIP requirements in a community's floodplain regulations (and in NH's state building code) is that the lowest floor of residential structures must be located at or above the BFE. In many instances, in order to get the lowest floor up to or above the BFE, foundation walls are used which create an enclosure (i.e. crawlspace).

Enclosures are allowed below the BFE but they must meet certain criteria. The purpose of the following criteria is to allow the automatic entry and exit of floodwaters so that interior and exterior pressures of the floodwaters will equalize during a flood and therefore will reduce damage to the enclosure and the structure during a flood event.

Enclosures located below the BFE must meet the following NFIP minimum criteria.

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1. Unfinished Area/Limited Uses

The enclosed area must be unfinished or flood resistant and used only for the parking of vehicles, building access, or storage. This area will be subject to water entering and exiting so it should be designed and used to handle wetness.

2. No Basements or Areas Below Ground on All Sides

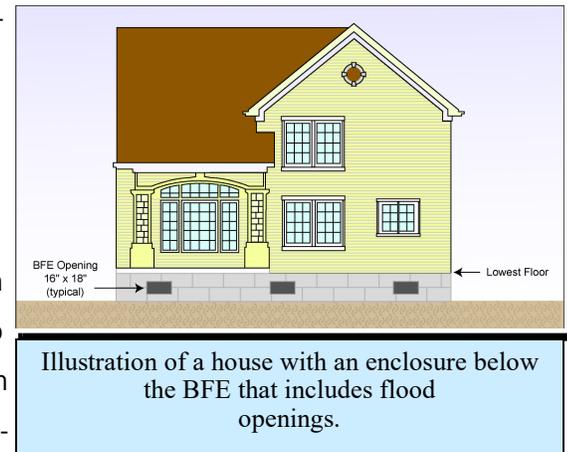
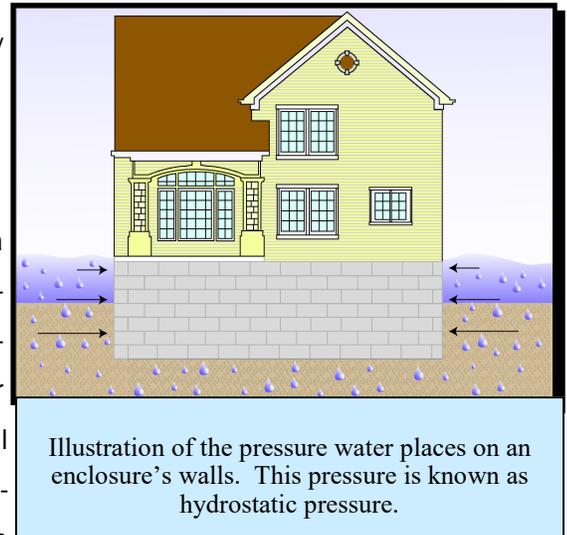
The area cannot be a basement or any other area in which its floor is below the ground on all sides. An area with a floor below the ground on all sides would act as a bathtub as water entered the enclosure and would not allow floodwaters to easily and quickly move out of the enclosure.

3. Flood Openings

The enclosed area must have flood openings. Flood openings are a series of small openings installed in the enclosure's walls. The purpose of the flood openings is to relieve the pressure of the floodwater on the exterior enclosure walls by allowing floodwaters to enter the enclosure and put pressure on the interior walls, which will equalize the pressure on the enclosure walls. Structures with enclosures that do not have openings are at risk of damage or collapse due to the uneven pressure the floodwaters will have on the enclosure walls.

Designs for flood openings must either meet or exceed the following minimum criteria:

1. A minimum of two openings with a total net area of not less than 1 square inch for every 1 square foot of enclosed area subject to flooding must be provided. The openings should be installed on at least two sides of each enclosed area to decrease the chances that all opening could be blocked with floating debris.
2. The bottom of each opening must be no higher than 1 foot above the higher of the final interior or exterior grades under the opening.
3. The openings may be equipped with screens, louvers, valves, or other coverings or devices—provided that they permit the automatic entry and exit of floodwaters. The openings must remain open at all times.



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An alternative to meeting criteria #1 above for those who want unique or individually designed openings is having the openings designed and certified by a registered engineer or architect. The openings must still be designed to automatically allow the entry and exit of floodwaters.

How Openings Affect Flood Insurance Rates

It is not only important for community officials to ensure enclosures below the BFE meet the NFIP requirements to prevent flood damage to the structure but also to prevent the homeowner from paying a high cost for flood insurance. Flood insurance rates are directly tied to how a structure is built and its compliance with the NFIP requirements. If an enclosure below the BFE does not meet the NFIP requirements then the floor of that enclosure becomes the “lowest floor” of the structure. Since the lowest floor is below the BFE, flood insurance rates will be much higher than if it was at or above the BFE as required.

Mechanical and Utility Equipment

The NFIP requires that electrical, heating, ventilation, plumbing, and air conditioning equipment, and other service facilities are designed and/or located so as to prevent water from entering or accumulating within the components during conditions of flooding. Therefore, these mechanical and utility components are prohibited below the BFE (except for the minimum electric service required to address life safety and electric code requirements).

Elevation Certificate

One of the best things a community official can do to ensure that enclosures below the BFE are built in compliance is to require the submittal of FEMA’s Elevation Certificate. The purpose of the Elevation Certificate is to gather elevation information necessary to ensure compliance with community floodplain regulations.

A sample Elevation Certificate that is marked up to show where community officials should verify that enclosures below the BFE, flood openings, and mechanical and equipment of new or substantially improved structures are compliant with the previously mentioned NFIP requirements can be viewed in [Factsheet #2 Elevation Certificates](#).

Information Resources

- **FEMA How To Guides:** Raise or Floodproof HVAC Equipment and Raise Electrical System Components
- **FEMA’s Protecting Building Utilities from Flood Damage**
- **FEMA Technical Bulletins:** Openings in Foundation Walls and Walls of Enclosure (TBI, Aug 2008) and Flood Damage Resistant Materials Requirements (TB2, Aug. 2008)