

Homeowner Options

FEMA provided on-site guidance to homeowners concerning repair options compliant with the local floodplain management ordinance.

National Flood Insurance Program

The repair of damaged houses in floodprone areas of Miami-Dade County is governed by floodplain management regulations enacted by the county as a participant in the National Flood Insurance Program (NFIP). The

NFIP is a Federal program that helps communities reduce flood risks and enables property owners and renters to buy flood insurance. The program is administered by FEMA.



DEFINITION

The **Special Flood Hazard Area (SFHA)** is the area inundated by the flood that has a 1-percent probability of being equaled or exceeded during any given year. The NFIP regulations refer to this flood as the “base flood.”

Communities participate in the NFIP by enacting and enforcing floodplain management regulations to reduce future flood risks. At a minimum, these regulations govern construction in the **Special Flood Hazard Areas (SFHAs)** shown on Flood Insurance Rate Maps (FIRMs) issued by FEMA (Figure 5).

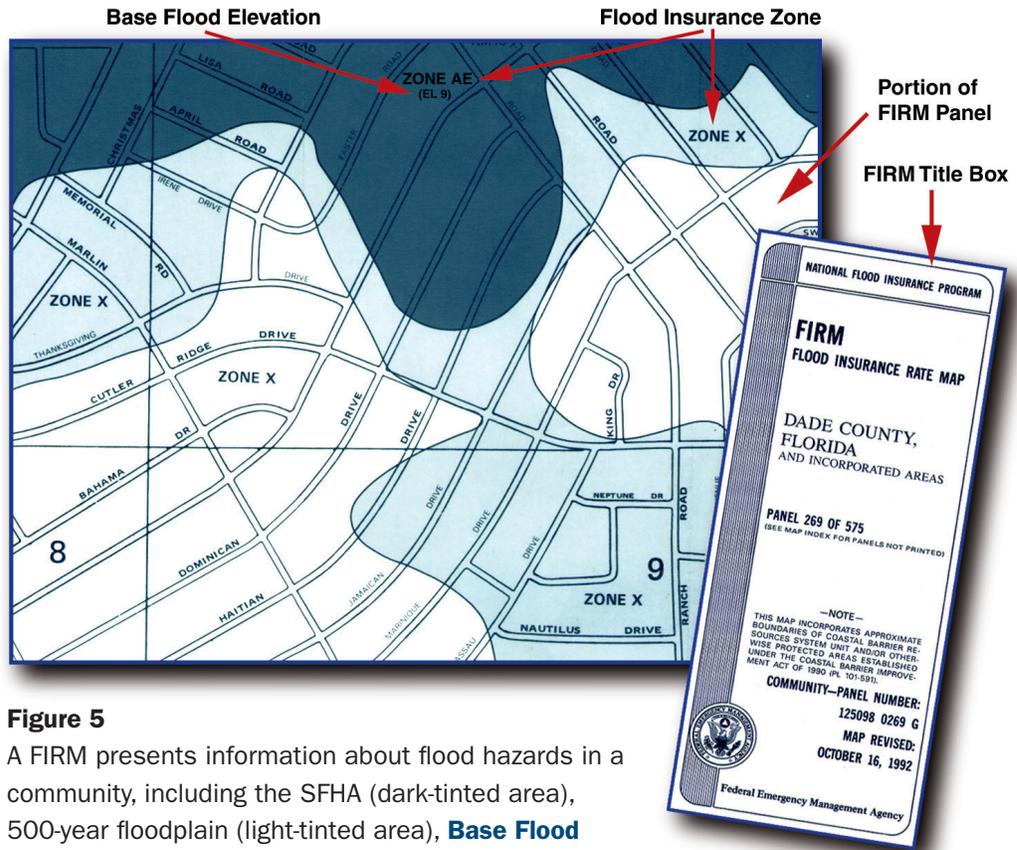


Figure 5 A FIRM presents information about flood hazards in a community, including the SFHA (dark-tinted area), 500-year floodplain (light-tinted area), **Base Flood Elevations**, (BFEs) (number in parentheses), and flood insurance zones (AE and X in this example).



DEFINITION

The **Base Flood Elevation (BFE)** is the elevation of the flood that has a 1-percent probability of being equaled or exceeded in any given year. The NFIP regulations refer to this flood as the “base flood.”

Note that the SFHA in the example in Figure 5 is designated Zone AE. This zone is only one of several applied to SFHAs under the NFIP, including V, VE, V1-V30, A, AE, A1-A30, AO, and AH. These zones indicate differences in the types and severity of flood hazards in SFHAs. For the purposes of this publication, it is sufficient to focus on the basic differences between the two main types of SFHA zones—V zones and A zones. The distinction is important because regulatory requirements associated with V zones and A zones differ significantly. As explained later in this chapter, these requirements affect the types of building elevation techniques that may be used under the NFIP.

V zones (VE, V1-V30, and V) identify Coastal High Hazard Areas, which are SFHAs subject to high-velocity wave action from storms or seismic sources. The hazards in V zones include not only inundation by flood waters, but also the impact of waves and waterborne debris and the effects of severe scour and erosion. In contrast, A zones identify SFHAs not within the Coastal High Hazard Area. Although A zones and V zones both identify areas at risk from the base flood, the severity of the flood hazard is less in A zones, primarily because high-velocity wave action either is not present or is less significant than in V zones. Consequently, wave and debris impact, erosion, and scour hazards are less severe in A zones.

A participating community must regulate three types of building construction in the SFHA (in both V zones and A zones):

- new construction
- substantial improvements to existing buildings
- repairs of substantially damaged buildings

For floodplain management purposes, the NFIP regulations, at Section 59.1 of the U.S. Code of Federal Regulations (CFR), define new construction, substantial improvement, and substantial damage as follows:

- **New construction** – structures for which the start of construction commenced on or after the effective date of a floodplain management regulation adopted by a community and includes any subsequent improvements to such structures.
- **Substantial improvement** – any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure before the start of construction of the improvement.
- **Substantial damage** – damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred.

If a building is significantly damaged by **any** cause, not just by flooding, the community's floodplain administrator—who may or may not be the local building official—must determine whether the building is *substantially damaged*, as defined above. FEMA does not play a direct role in this determination. Rather, FEMA's role and that of the NFIP State Coordinator is to provide technical assistance to local officials who administer community ordinances that meet the NFIP minimum floodplain management requirements.

Each participating community must require that new residential buildings, substantially improved residential buildings, and substantially damaged residential buildings be elevated above the BFE so that the potential for future flood damage is reduced. The elevation techniques that may be used under the NFIP depend on whether the building to be elevated is in a V zone or an A zone.

In a V zone, the NFIP regulations require that the building be elevated on an open foundation (e.g., pilings, posts, piers) and that the bottom of the **lowest horizontal structural member** (e.g., floor support beam) be at or above the BFE. In other words, a building in a V zone may not be supported by continuous walls below the BFE. The basis for this requirement is that continuous walls, and therefore the building they support, are more susceptible to damage from the additional hazards present in V zones—wave impact, waterborne debris impact, scour, and erosion, as discussed previously.



DEFINITION

Under the NFIP regulations, the **lowest floor** of a house or other building is the lowest floor of the lowest enclosed area, including a basement.

In A zones, where flood hazards are less severe, buildings may be elevated either on an open foundation or on continuous foundation walls below the BFE (Figure 6). Regardless of the type of foundation used, A-zone buildings must be elevated so that the **lowest floor** is at or above the BFE, as shown in Figure 6. If continuous walls are used below the BFE, they must be equipped with openings that allow flood waters to flow into and out of the area enclosed by the walls (Figure 6). Allowing the entry and exit of flood waters ensures that water pressures will be the same on both sides of the walls and reduces the likelihood that water pressure will cause the walls to fail.

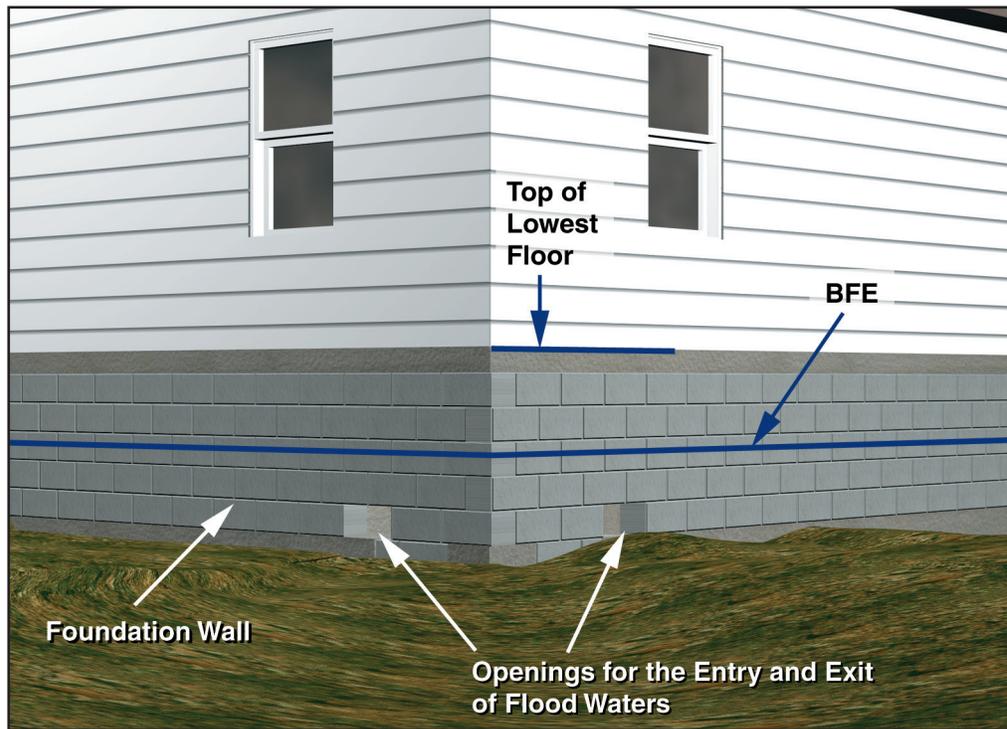


Figure 6

In a new, substantially improved, or substantially damaged building in an A zone, the elevation of the lowest floor must be at or above the BFE.

It is important to note that each of the elevation techniques described and illustrated in this publication depends on the use of continuous walls below the BFE. Therefore, under the NFIP regulations, these techniques may be used only for buildings in A zones, such as the eight case study buildings presented in Chapter 4.

Technical and Regulatory Guidance from FEMA

In the aftermath of Hurricane Andrew, homeowners wanted to begin repairing their damaged houses as soon as possible. They needed immediate guidance concerning repair methods and the floodplain management requirements enforced by Miami-Dade County as a participant in the NFIP. To respond to these needs under the catastrophic conditions resulting from Hurricane Andrew, FEMA, in partnership with other Federal agencies, the State of Florida, and Miami-Dade County, established a Reconstruction Information Center (RIC) in the area where the greatest damage had occurred.



NOTE

In major disasters, FEMA and the affected state will often open one or more Disaster Recovery Centers (DRCs). At a DRC, homeowners and other interested parties can obtain information about how to reduce future flood losses through hazard mitigation.

The RIC provided homeowners with engineering and architectural advice, guidance regarding floodplain management regulations, and information about financial assistance programs operated by FEMA and other agencies. These services were available to all homeowners but were especially valuable to owners of substantially damaged houses.

At the RIC, owners of substantially damaged houses in SFHAs learned that they had two options for complying with the requirement to elevate the lowest floor to or above the flood level:

1. Demolish the remnants of the house and build a new house on the same site with an elevated lowest floor, or
2. Repair the house and elevate the lowest floor as part of the repair process.

Owners of substantially damaged houses in SFHAs that remained structurally sound usually chose the second option—repairing the house and elevating the lowest floor. Depending on how the houses were constructed, their owners had a choice of up to three techniques for elevating the lowest floor (as illustrated on the following pages):

1. Extend the walls of the house upward and raise the lowest floor (Figure 7).
2. Convert the existing lower area of the house to non-habitable space and build a new second story for living space (Figure 8).
3. Lift the entire house, with the floor slab attached, and build a new foundation to elevate the house (Figure 9).

Chapter 3 presents an overview of the three techniques. Chapter 4 covers the techniques in detail and shows how they were used in the repair of eight substantially damaged houses in south Florida.

Figure 7
Technique 1 –
Extend the walls of
the house upward and
raise the lowest floor.

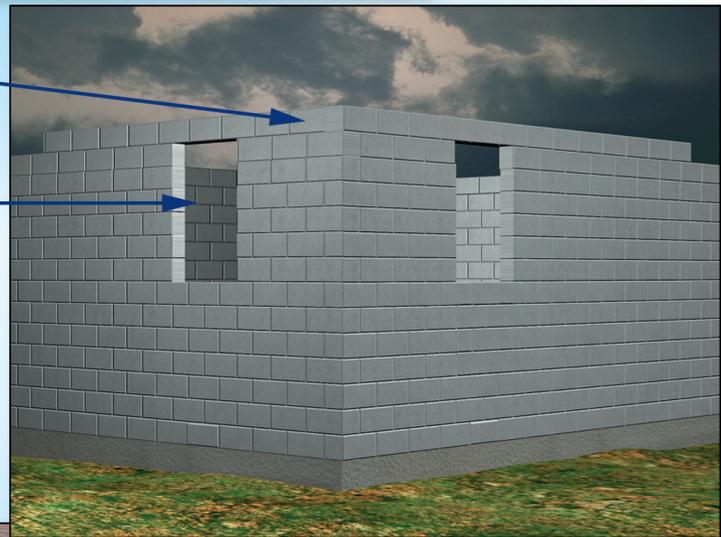


House at the time
Hurricane Andrew
struck

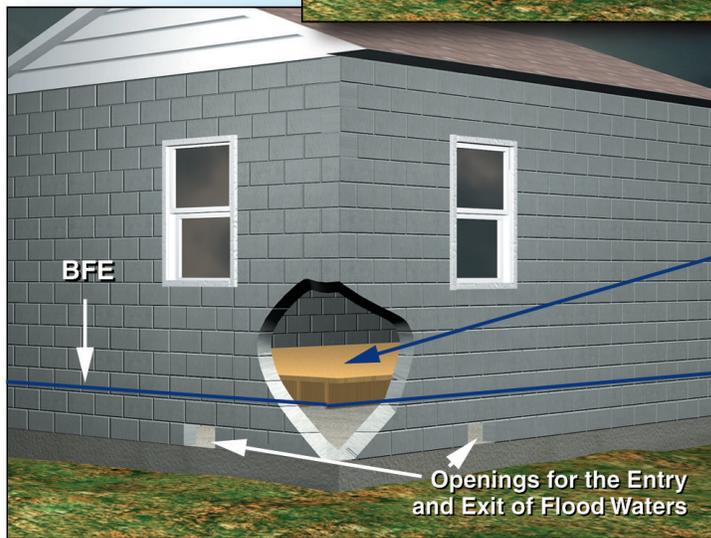
Original Level
of the Lowest
Floor

Extended Walls

Raised Window
Opening



Substantially damaged house undergoing
repairs that will bring it into compliance
with Miami-Dade County floodplain
management requirements



New,
Raised Floor

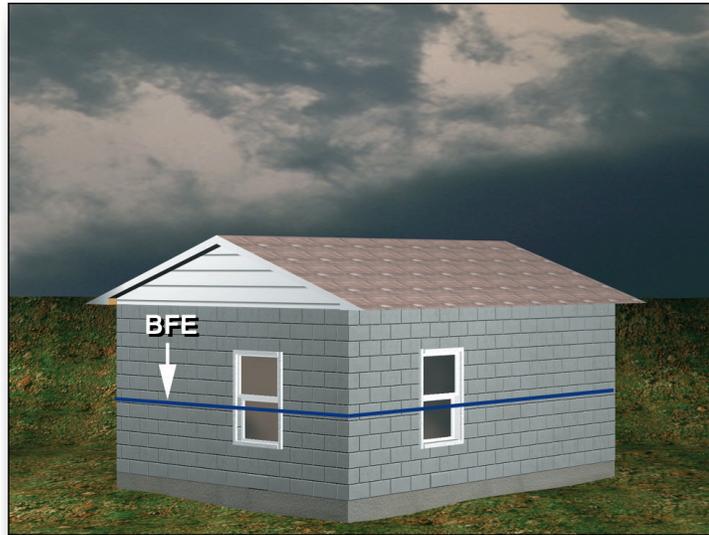
House after
completion of repairs

Openings for the Entry
and Exit of Flood Waters

Figure 8

Technique 2 – Convert the existing lower area of the house to non-habitable space and build a new second story for living space.

House at the time Hurricane Andrew struck



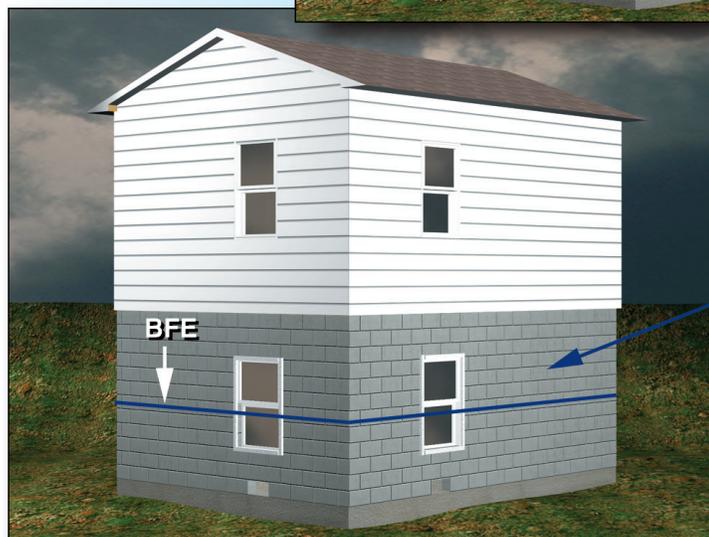
New Second Story Above BFE

Substantially damaged house undergoing repairs that will bring it into compliance with Miami-Dade County floodplain management requirements



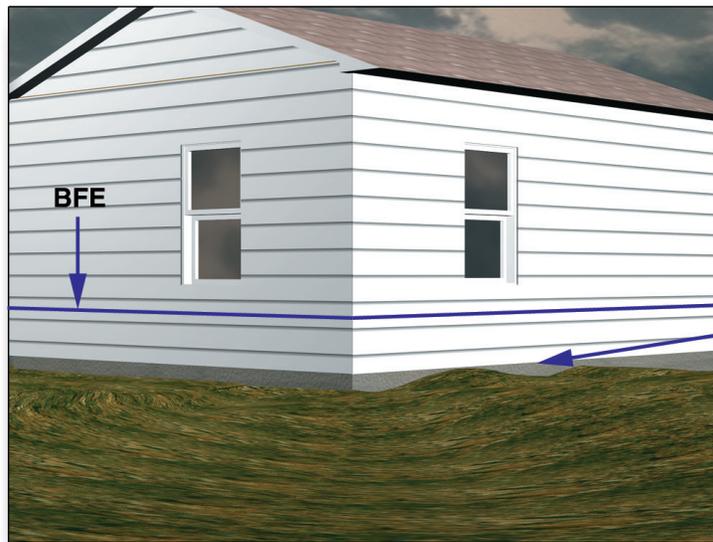
Openings for the Entry and Exit of Flood Waters

House after completion of repairs



Lower Area Converted to Non-Habitable Space for Storage, Parking, or Building Access

Figure 9
Technique 3 –
Lift the entire house,
with the floor slab
attached, and build
a new foundation to
elevate the house.



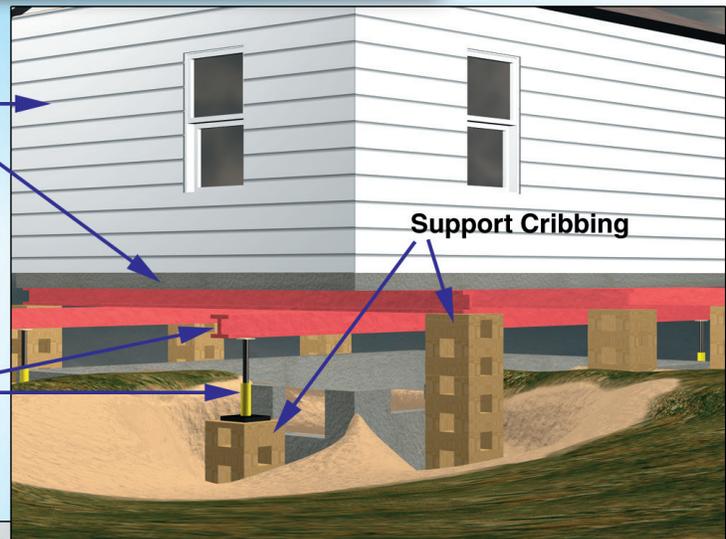
House at the time
Hurricane Andrew
struck

Original Level
of the Lowest
Floor

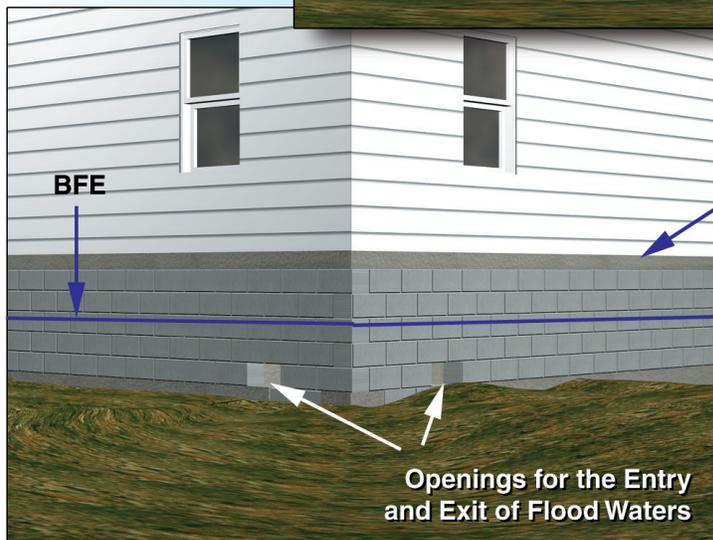
Substantially
damaged house
undergoing repairs
that will bring it
into compliance
with Miami-Dade
County floodplain
management
requirements

House and
Floor Slab
Lifted
Together

House Lifted
on Jacks and
I-Beams



Support Cribbing



New Level
of the Raised
Lowest Floor

House after
completion of
repairs

Openings for the Entry
and Exit of Flood Waters