



### Description

This publication provides guidance on flood risk evaluation and mitigation of large multi-family buildings, particularly in urban areas. The focus is mid-rise and high-rise buildings, although many of the approaches could be applied to low-rise buildings. This publication is not intended to address rowhouses or townhouses.

To help readers develop a comprehensive mitigation approach, this publication describes the floodplain management regulatory framework, the process for determining flood risk, potential mitigation measures to address that risk, and information on flood insurance considerations. Primarily, the publication focuses on the retrofit of existing construction<sup>1</sup> to help readers develop a comprehensive mitigation approach. New construction is also addressed.

<sup>1</sup> Buildings existing before a community's first Flood Insurance Rate Map

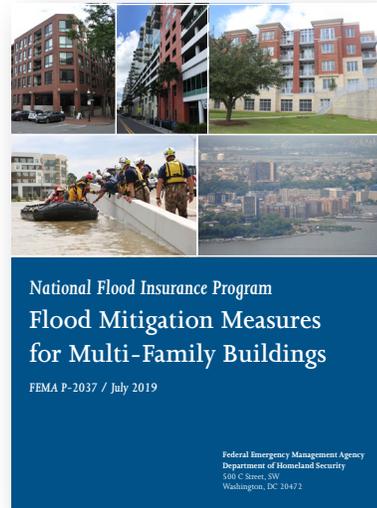
### Key Topics:

- Determining Building Designation Levels:
  - New Construction/SI/SD
  - Legal Non-Conforming Construction
  - Existing Construction
- Applying NFIP Requirements, Substantial Improvement and Substantial Damage to Multi-Family Buildings
- Flood Risks and Hazards for Multi-Family Buildings
  - Determining Flood Protection Level
- Guidance on Lowest Floor Determination on Multi-Family Buildings
- Mitigation Measures for Multi-Family Buildings:
  - Elevation
  - Wet Floodproofing
  - Dry Floodproofing
  - Elevating or Relocating Equipment
  - Dry Floodproofing Building Utility Systems and Creating Vaults
  - Repurposed Lowest Floor
  - Perimeter Floodwall
- Developing a Mitigation Strategy for Existing Multi-Family Buildings

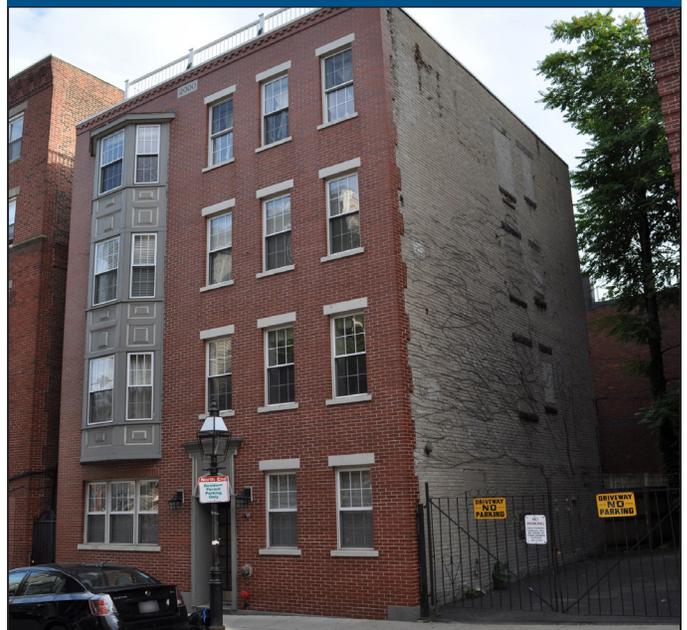
The guidance describes the steps in developing and applying a mitigation strategy and concludes with some representative mitigation scenarios.

### Target Audience

Building owners, designers, investors, builders/contractors, institutional partners, housing agencies and residents, property and facility managers responsible for operating, designing, constructing, or maintaining multi-family buildings, and local officials responsible for enforcing floodplain management regulations or building codes.



### Example of a Multi-Family Building



## Process for Developing a Mitigation Strategy for existing Multi-family Buildings

### Determination of Building Designation

- New Construction/SI/SD
- Legal Non-Conforming Construction
- Existing Construction

Determining which building designation applies to the building(s) is important to any flood protection measure being considered to not result in a building becoming in violation of NFIP and local floodplain management requirements.

### Determine Flood Protection Level

An evaluation of the flood risk should be made including a determination of what Flood Protection Level is appropriate for the building.

### Conduct Site and Building Vulnerability Assessment

Once the Flood Protection Level is selected, a vulnerability assessment of the site and building can be conducted to identify where the building may need to be strengthened and where floodwater could potentially enter the building.

### Evaluate Mitigation Measures and Selection of Measure(s)

Flood mitigation measures, or combination of measures can then be evaluated and selected.

### Finalize Mitigation Strategy

The steps outlined above can help one develop a comprehensive mitigation strategy to reduce the building's vulnerability and improve its resilience to flood damage.

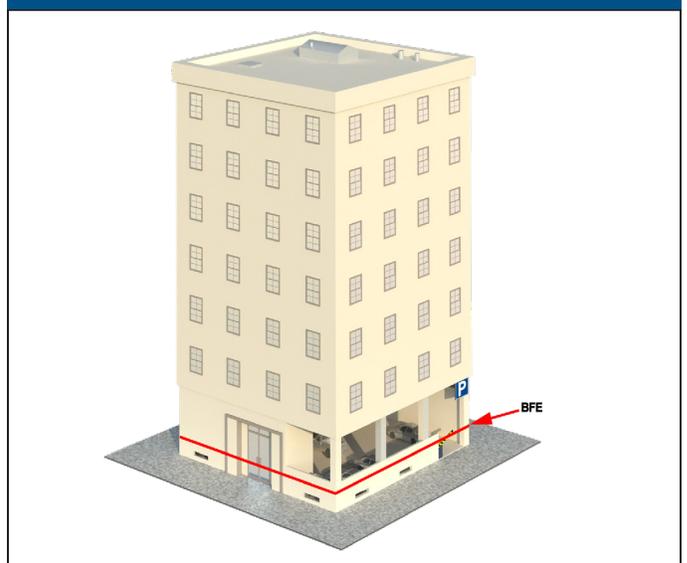
## Benefits of Mitigation:

- Lessen flood damages
- Lessen economic loss
- Allowing occupation of the building in a shorter time frame
- Allowing quicker restoration of utility services
- Lower flood insurance premiums
- Modifications may also include energy efficient improvements

### Mixed-Use Multi-Family Building with Commercial Space



### Example of Mitigation Measure: Wet Floodproofing



### Example of Mitigation Measure: Dry Floodproofing

