



# Floodproofing Regulations for Municipalities

There are a number of ways cities and towns can reduce damages and losses and help its citizens reduce their risks, save money and bounce back more quickly from flooding. Most Vermont communities have regulations and standards in place to floodproof buildings and infrastructure.

## Why it Matters

Flooding causes the largest annual disaster costs in Vermont. From tropic storm Irene alone, local and state costs were \$153 million with an additional \$603 million in federal outlays. In a number of communities, roads, bridges and critical facilities are located in or near areas vulnerable to flooding. Municipal regulations that require vulnerable buildings to be flood proofed when they are improved can help reduce the costs of flood damage to individuals, organizations and governments.

## Floodproofing Options to Protect Buildings

Municipalities participating in the National Flood Insurance Program (NFIP) must adopt and enforce floodplain management and floodproofing regulations that meet or exceed the minimum NFIP standards and requirements. The NFIP establishes design criteria and performance requirements for buildings located within the Special Flood Hazard Area (SFHA). The criteria specify how a building will be constructed in order to minimize or reduce future flood damage. A primary requirement is to elevate buildings above the Base Flood Elevation (BFE). Depending on the location, non-residential buildings may also be protected with wet or dry floodproofing measures (see floodproofing techniques for business)

### NFIP General Requirements for Dry Floodproofing

- ➔ Permitted only in non-residential buildings in special flood hazard areas.
- ➔ Must be designed so the building is watertight below the BFE with walls substantially impermeable to floodwater.

## DEFINITION

**Special Flood Hazard Area (SFHA)** is a high-risk area defined as any land that would be inundated by a flood having a 1% chance of occurring in any given year (also referred to as the base flood). SFHAs are useful tools for identifying the risk associated with the inundation of floodwater. However, the potential for flood damage due to bank erosion, inadequate drainage, runoff, and storms larger than the base flood are not taken into account on these maps. To fill this gap in flood risks, the state has developed [River Corridor maps](#) that show the community's risk of flood damage due to erosion. Municipalities have the option of enacting local regulations that are more restrictive than the minimum NFIP requirements. For example, a municipality may prohibit new development within the state-designated River Corridor.

- Must completely floodproof utilities and sewer lines below the BFE.
- A registered design professional must develop and/or review structural designs, specifications, and plans and certify that the design and methods of construction are in accordance with accepted standards of practice.
- Dry floodproofed properties are eligible for favorable insurance rates only if floodproofing extends to at least 1 foot above the BFE.

**NFIP General Requirements for Wet Floodproofing**

- Permitted only for attached garages or parking, access, and storage areas below the BFE.
- Some historic buildings, outbuildings, and agricultural buildings may be wet floodproofed.
- All portions of the structure below the BFE must be constructed of flood-resistant materials.
- Must be designed to allow for automatic entry and exit of floodwaters.

**Bylaws**

Most Vermont municipalities meet the NFIP requirements with a special purpose floodplain ordinance. These are often part of the zoning bylaw but can also be stand-alone regulations for towns without zoning. The state has created several variations of [model flood hazard regulations](#) that municipalities can adapt to their particular circumstances. All include the minimum floodproofing requirements but range in the degree of administrative complexity and the level of regulation imposed on new development.

The [Vermont Rivers Program](#) or your [Regional Planning Commission](#) (RPC) can help develop and review your ordinance for NFIP compliance.

**Building Codes**

Adopting building code requirements for structures built or reconstructed in or near flood plains can help protect structures and people. In Vermont, the state administers building codes for commercial buildings and multi-family housing, but not for single family homes. The state also allows municipalities to have stricter building codes than what the state requires and allows municipalities to adopt codes for single family homes.

Municipalities that have adopted building codes and have the resources to administer such codes effectively should consider upgrading their standards to provide an extra margin of safety from flood damage. The International Building Code and International Residential Code, which most state building codes adopt or use as a foundation, requires higher design and construction standards for flood-prone areas.

**TOOLS FOR WEATHERING THE STORM**

**DEFINITION**

**Base Flood Elevation (BFE)** is the calculated elevation to which floodwater is anticipated to rise during the base flood. BFEs are shown on Flood Insurance Rate Maps (FIRMs) and on the flood profiles. The BFE is the regulatory requirement for the elevation or floodproofing of building. The relationship between the BFE and a building’s elevation determines the flood insurance premium.

