

## What is Floodproofing?

### Managing Flood Risk is Your Responsibility

Many existing buildings located near rivers, streams, and lakes (and some located a surprising distance away) have a risk of flooding. As the owner and/or occupant of such a structure, you can put your head in the sand and hope for the best. Or you can take an active role in understanding the risks and taking measures to reduce the chances and severity of future flood damage to the structure and its contents.

***Floodproofing** can be defined as any combination of structural or non-structural additions, changes, or adjustments to a building that reduces or prevents flood damage to the structure and/or its contents. Simply stated, floodproofing includes any effort a property owner may take to reduce flood damage.*

### Options for Protecting Flood-Prone Property

There are a number of ways to protect your property from flood damage (and yourself from the associated heartache). The options include:

- Demolition: Removing flood-prone development and relocating to a safer location is a permanent solution to a flooding problem. This is most often done after a major flood as an alternative to costly repairs. Grant funding for a “buyout” may be available to cover some of the costs.
  - Relocation: Relocating an existing structure is also a dependable way to remove both the structure and the people using that structure from harm’s way. The building is raised, placed on wheels, transported to a new location (away from the flood hazard), and placed on a new foundation.
  - Elevation: Almost any structurally-sound building can be elevated so that the finished living space is located above the anticipated height of flood waters. The building is separated from its foundation, lifted with hydraulic jacks, and placed on a new or extended foundation. The building can be elevated on solid perimeter foundation walls, fill, or an open foundation system (piers, posts, columns, or piles).
  - Levees and floodwalls: A structure can be surrounded by a barrier to prevent the encroachment of floodwaters. This can be a levee constructed of compacted fill or a floodwall of concrete or other material. If openings are left for the driveway and/or sidewalk, closures must be installed to close these access points prior to a flood.
- 
- Dry floodproofing: Dry floodproofing involves sealing building walls with waterproof compounds, so that the structure is watertight. This technique can only be used when the walls are strong enough to withstand the hydrostatic force of the water. Shields may be installed to seal off doors, windows, and other openings.
  - Wet floodproofing: There are a variety of techniques that can reduce the damage to a building and its contents, while allowing the structure to flood. The building must be anchored to prevent flotation and must have flood vents, or permanent openings, that allow water to flow in and out of the structure without damaging the foundation. Vulnerable items, such as utilities, appliances, and contents are relocated (permanently or temporarily) to higher parts of the building (above the anticipated flood height) or protected in place. Flood-damage resistant building materials are used for those parts of the building that will be flooded. Automatic shut-off valves are installed on sewer and fuel lines.

- **Flood insurance:** Insurance will do nothing to prevent flood damage, but can protect your financial investment. Although the annual premiums for flood insurance may be high (depending on the location, age, and elevation of the structure), the investment may significantly lower the financial burden when flood damage occurs. Flood insurance coverage is available from the National Flood Insurance Program (NFIP) for any building and/or its contents if the municipality participates in the NFIP (by regulating floodplain development).

### **Developing a Floodproofing Strategy**

Developing an appropriate strategy for protecting your property (and yourself) from flood hazards requires evaluation of the risks, technical considerations, costs, and personal preferences:

- **Regulations:** Consult with the municipal building official about regulations that relate to floodproofing options. If an existing building in the regulated floodplain has been substantially damaged or is substantially improved, regulations require that the entire structure be brought into compliance with current floodplain development standards, which precludes the use of some floodproofing techniques. Other building code requirements will also apply to the project.
- **Assess the hazards:** The desired depth of flood protection is a central consideration, since both the technical challenges and the costs for floodproofing measures may increase with water depth. The potential for high water velocities, scouring, ice, and debris flows should also be taken into account. The amount of warning time must also be considered – protective measures that require time to implement aren't appropriate if the area is prone to flash flooding.
- **Identify feasible floodproofing options:** The applicability of any floodproofing technique depends on the nature of the flood hazard (depth, velocity, debris potential, warning time), site characteristics (size, location, slope, soil type), and building characteristics (structural condition, type of foundation, type of building construction).
- **Assess the costs and benefits:** Some floodproofing options may be too costly and others may not provide the desired amount of risk reduction.
- **Develop a strategy for managing flood risks:** The decision regarding a floodproofing project must also be based on the personal preferences and concerns of the people who will be living with the results on a day-to-day basis. Are there aesthetic preferences? Concerns about the accessibility of the building? Special considerations related to historic structures? Would someone be available and able to implement protective measures prior to a flood? How much risk are you willing to live with? These considerations must be integrated with technical and financial considerations to develop the most appropriate strategy for managing the flood risks in a particular situation.

***Floodproofing does not eliminate all flood risks – but it can “buy down” the risk to an acceptable level.***

**Additional information about floodproofing techniques is provided in other information sheets** (available at <http://www.stcplanning.org/index.asp?pageId=107>):

- ☛ *Floodproofing Info #2: Elevating a Structure*
- ☛ *Floodproofing Info #3: Relocating a Structure*
- ☛ *Floodproofing Info #4: Dry Floodproofing*
- ☛ *Floodproofing Info #5: Wet Floodproofing*
- ☛ *Floodproofing Info #6: Levees and Floodwalls*
- ☛ *Floodproofing Info #7: Selecting Floodproofing Techniques – Regulatory Considerations*
- ☛ *Floodproofing Info #8: Selecting Floodproofing Techniques – Assessing Flood Risk*
- ☛ *Floodproofing Info #9: Selecting Floodproofing Techniques – Technical Considerations*
- ☛ *Floodproofing Info #10: Selecting Floodproofing Techniques – Financial Considerations*
- ☛ *Floodproofing Resources*