



Actions for Flood Resilient Homes: Wet Floodproofing

What is wet floodproofing?

Wet floodproofing refers to a range of strategies used to prevent or provide resistance to flood damage—while allowing water into the uninhabited portion of a building (e.g., unfinished basement, crawlspace, garage). Allowing floodwater to enter the enclosed areas of a home equalizes pressure, which can prevent structural damage. Successful wetproofing involves (1) ensuring that floodwaters inside the home rise and fall at the same rate as floodwaters outside the home, (2) reducing damage through the use of flood-resistant materials, (3) protecting service equipment inside and outside of the home, and (4) relocating any high-value items stored below the designed flood elevation (DFE).

Who should use wet floodproofing?

If you are at risk of flooding and cannot elevate your home or build reliable flood barriers, wet floodproofing of non-living spaces is an option. It is most suitable for shallow flooding that inundates uninhabited space. It is not practical for most slab-on-grade structures that have the living space at or near ground level. Also, it is not a reasonable approach if the duration of a flood is expected to be more than one day.



<https://www.restoration1greaterminneapolis.com/how-to-deal-with-a-flooded-basement>

✓ Before flood action

✗ During flood action

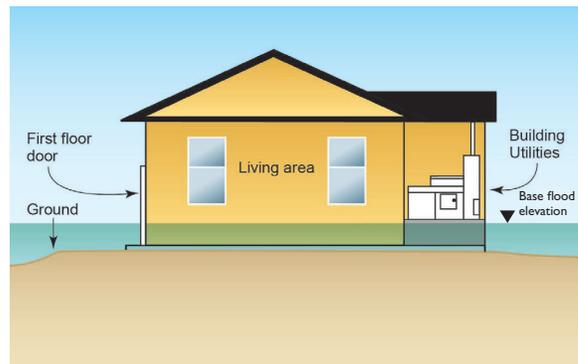
✗ After flood action

What are wet floodproofing methods?

An advantage of wet floodproofing is that it is flexible; it can be done in stages—many of them relatively inexpensively. A good time to employ wet floodproofing strategies is when you remodel your home. The following are some wet floodproofing methods:

- **Elevate appliances and utilities or install barriers:** Items that should be elevated or protected with a barrier include your furnace and air-conditioning unit, outside air-conditioner compressor, washer and dryer, water heater, freezer, and electrical outlets and switches. You can also relocate these to a place in your home that is higher than the DFE (e.g., an attic), or build a small addition that would serve as a utility room and as storage for valuable furnishings during a flood.
- **Use flood-resistant materials:** The Federal Emergency Management Agency (FEMA) publishes flood-resistant classifications for flooring, wall, and ceiling materials, as well as the adhesives used to install them (Technical Bulletin 2-08). Carpeting, paneling, and gypsum wallboard can all be replaced with materials that would require cleaning rather than replacement. *A table on the following page* lists materials that are acceptable in wet floodproofing home projects.

(continued on next page)



Wet floodproofing techniques for a house. Image from FEMA P-259 (Figure -10)

COST: VARIES¹

✗ Reduces exposure

✓ Reduces vulnerability

For more information on flood resilience, contact the Engineering Department at 952-826-0371.

¹Costs of wet floodproofing vary with the methods adopted. Major costs are associated with rearrangement of utility systems, installation of flood vents, and replacement of materials that are not resistant to floods. **Note that wet floodproofing will not reduce flood insurance premium rates on residential structures.**



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Other considerations

- Ongoing maintenance is required to minimize flood risks.
- Pumping water from a basement too soon after a flood may lead to structural damage.
- Work on electrical systems, gas systems, or air-conditioning compressors requires a licensed contractor, and permits may be required.
- Sewage backflow prevention is important; a backflow valve should be installed.
- Because wet floodproofing allows your home to flood, extensive cleanup may be necessary to remove potential chemical and biological contamination and prevent mold growth and decay.

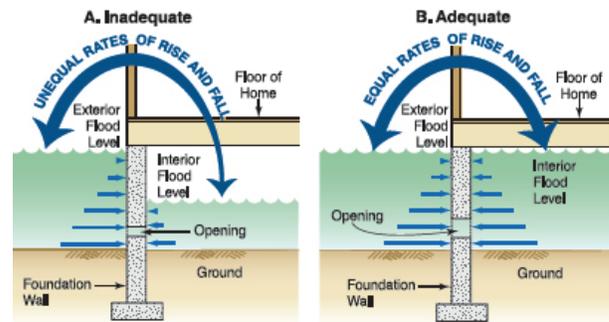
What are wet floodproofing methods? (continued)

Materials that are acceptable in wet floodproofing home projects:

Material Type	Acceptable	Unacceptable
Structural Flooring Materials	<ul style="list-style-type: none"> • Concrete • Naturally decay-resistant lumber • Pressure-treated plywood 	<ul style="list-style-type: none"> • Oriented strand board (OSB)
Finish Flooring Materials	<ul style="list-style-type: none"> • Clay tile • Ceramic or porcelain tile • Terrazzo tile • Vinyl tile or sheets 	<ul style="list-style-type: none"> • Engineered wood or laminate flooring • Carpeting • Wood flooring
Structural Wall and Ceiling Materials	<ul style="list-style-type: none"> • Brick face, concrete, or concrete block • Cement board/fiber-cement board • Pressure-treated plywood • Solid, standard structural lumber (2x4) • Non-paper-faced gypsum board 	<ul style="list-style-type: none"> • Fiberglass insulation • Paper-faced gypsum board • OSB
Finish Wall and Ceiling Materials	<ul style="list-style-type: none"> • Glass blocks • Metal cabinets or doors • Latex paint 	<ul style="list-style-type: none"> • Wood cabinets and doors • Non-latex paint • Particleboard cabinets and doors • Wallpaper

FEMA P-312, Homeowner's Guide to Retrofitting 3rd Edition (2014)

- **Install flood vents:** Flood vents (permanent openings) allow water into the structure, equalizing interior and exterior pressures to avoid structural damage.



(Above) "Wall openings must allow floodwaters not only to enter the home, but also to rise and fall at the same rate as floodwaters outside the home." Images provided by FEMA P-312, Homeowner's Guide to Retrofitting 3rd Edition (2014).

(Left) Base flood elevation and location of flood vents. Images provided by FEMA Technical Bulletin 2, 2008, Openings in Foundation Walls and Walls of Enclosures.