

# Floodproof Window

## Overview

- Floodproof windows can be installed to provide protection from flooding.
- Floodproof windows have a seal and are reinforced to prevent floodwaters from entering the structure.
- Floodproof windows can be installed instead of more extensive floodproofing measures if the building cannot be elevated, if it is likely that temporary flood protection measures (e.g. barriers or shields) will not be set up on time, and/or if the windows cannot be blocked off by floodproof shields.
- Floodproof windows are also recommended if there are large, low to the ground windows that could be completely covered by floodwaters and would otherwise require temporary floodproof barriers to cover the entire window in order to prevent flooding.
- Floodproof windows can also be used if the storefront glass is floor to ceiling, making it a structural wall.
- Only buildings constructed with concrete or masonry materials are candidates for floodproof windows.
- The structure's walls must also be floodproof or resistant in order to keep water from entering the structure.
- Before flooding events, the windows must be closed and locked (if applicable).
- Prior to installation, the structural soundness of the building, walls, and floor slabs (including their ability to withstand flood loads) must be determined. Therefore, a licensed structural engineer is required in floodproof window installation.
- If the amount of flooding exceeds the capacity of the structure's walls, floodproof windows could cause more damage to the structure.



## Key Takeaways

During flood events, water can enter a structure through un-sealed openings like doors and windows.

To avoid flood damage inside of a structure, floodproof windows can be installed.

Floodproof windows are water-tight windows. They are designed to prevent any seepage during flood events and can reduce flood damage associated costs.



# I-ADAPT

## Exterior Adaptation Floodproof Window

### Estimated Costs/Benefits

\*U.S. dollars (2022), estimates are subject to change

Potential Costs		Potential Benefits		
Item	Estimate	Post-Flood Recovery Actions	Estimate	
Residential window (standard size range)	\$6,000-\$10,000	Flood damage recovery (professional clean-up, mold removal, replacement/ repair of flood damaged items)	1 inch water	\$10,800-\$53,500+
Structural engineer	\$400-\$600		↓	↓
Installation	\$100-\$300			
<b>OR</b>			3 feet water	\$39,800-\$185,700+
Commercial floor to ceiling window (8'x10')	\$35,000-\$50,000			
Structural engineer	\$400-\$600			
Installation	\$300-\$1,000			
<b>ESTIMATED TOTAL COST PER WINDOW</b>	<b>\$6,500-\$51,600</b>	<b>ESTIMATED TOTAL SAVINGS</b>	<b>\$10,800-\$185,700+</b>	

### Additional Resources

- [FEMA Engineer Principles and Practices for Retro-fitting Flood-Prone Residential Structures \(FEMA P-259\)](#)
- [FEMA Homeowner's Guide to Retrofitting \(Chapter 8\)](#)

Resources can also be found at <https://de.gov/iadapt>

### Expected Maintenance

- Periodically check windows to ensure they have not been damaged in any way.
- Clean the windows after flooding events.

### Additional Actions

- Apply waterproof sealants on exterior walls of structure.
- Ensure that the windows are closed and locked (if applicable) before flooding events.

### Permitting Agencies

Contacts for permitting requirements include but are not limited to the following:

- Your city and/or county government for local flood ordinances or regulations
- Your city and/or county government for building permits

### Who to Contact

- Structural engineer
- Window installation contractor

Technical definitions and more information are located on the I-ADAPT website: <https://de.gov/iadapt>.

This information is intended to be used for planning purposes. It is not intended to substitute or take precedence over the guidance of design engineers, contractors, utility companies or regulatory agencies.

For more information, contact DNREC's Division of Climate, Coastal and Energy at [DNREC\\_IADAPT@Delaware.gov](mailto:DNREC_IADAPT@Delaware.gov)

