Permanent Closure of Openings

Overview

- Commercial property owners can permanently close non-safety egress openings that are below the Base Flood Elevation line (BFE) such as windows, doors, or coal chutes in order to decrease flood risk for the building.
- Openings can be closed permanently 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 building cannot be blocked off by flood barriers due to commercial use.
- The building must be constructed with concrete or masonry materials to be a candidate for the closure of openings.
- The structure's walls must also be floodproof or resistant in order to keep water from entering the structure.
- The structural soundness of the building, walls, and floor slabs including their ability to withstand flood loads must be determined. A licensed design professional is required.
- If the amount of flooding exceeds the capacity of the structure's walls, closing openings could cause more damage to the structure.

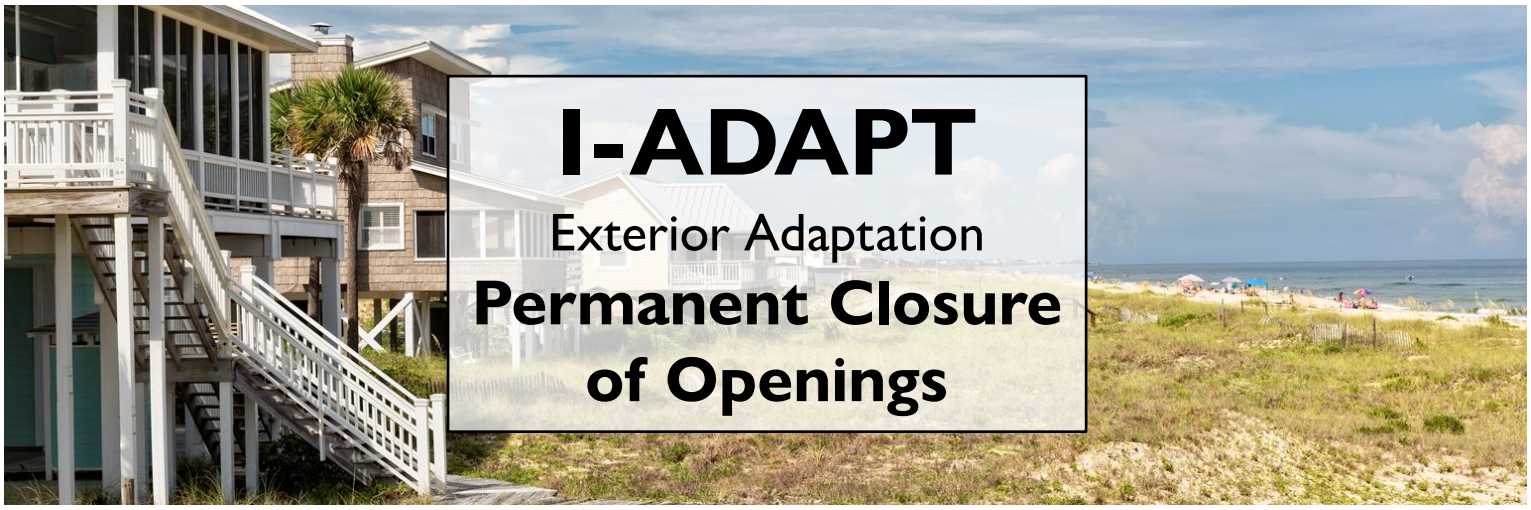
Photo credit: FEMA

Key Takeaways

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

To avoid flood damage inside of a commercial structure, non-essential openings can be permanently closed.

When vulnerable openings of the building are permanently closed, flood damage associated costs will likely decrease. However, this measure should only be used for durable, strong structures.



I-ADAPT

Exterior Adaptation

Permanent Closure of Openings

Estimated Costs/Benefits

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

Potential Costs		Potential Benefits		
Item	*Estimate*	*Post-Flood Recovery Actions*	*Estimate*	
Sealing a door-sized opening	$300-$1,000	Flood damage recovery (professional clean-up, mold removal, replacement/ repair of flood damaged items)	1 inch water ↓ 3 feet water	$10,800-$53,500+ ↓ $39,800-$185,700+
Sealing a window-sized opening	$180-$1,000			
ESTIMATED TOTAL COST PER OPENING	**$180-$1,000**	**ESTIMATED TOTAL SAVINGS**	**$10,800-$185,700+**	

Potential Funding Sources

- Flood Mitigation Assistance Grant (FMA)
- Building Resilient Infrastructure and Communities Grant (BRIC)

Additional Resources

- FEMA Engineer Principles and Practices for Retro-fitting Flood-Prone Residential Structures (FEMA P-259)
- FEMA Other Methods

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

Expected Maintenance

- Periodically check closures to ensure they have not cracked or been damaged in any way.
- Perform regular wall maintenance.

Additional Actions

- Apply waterproof sealants on exterior walls of structure, including on the permanently closed opening.

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
- General contractor

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

For more information, contact DNREC's Division of Climate, Coastal and Energy at DNREC_IADAPT@Delaware.gov