

Commercial Floodproof Barrier/Shield

Overview

- Shields can be used in combination with sealants to provide protection from a maximum of three feet of flooding for buildings with non-reinforced concrete block walls.
- Some barriers/shields can be permanent if they are designed as a hinged plate or as a self-closing barrier at sub-grade openings.
- Commercial barrier types:
 - Lift-out flood barrier shield (must be installed prior to flooding)
 - Hinged flood barrier shield (must be closed prior to flooding)
 - Self-closing barrier shield (closes automatically when it senses flooding)
- Prior to flood events, temporary shields will need to be placed after vacating the structure.

Design Considerations:

- If using a temporary flood-damage prevention shield, installation of the shield should be designed to be quick and easy.
- Even with shield installation, there will still be some water infiltration. Therefore, some type of dewatering system like a sump pump may be necessary.
- If the amount of flooding exceeds the capacity of the structure's walls, the shield can cause more damage to the structure.
- The structural soundness of the building, walls, and floor slabs including their ability to withstand flood loads must be determined. Therefore, a competent design professional is essential in shield installation.
- Shields are not recommended for structures that may experience flooding lasting longer than 12-24 hours.



Photo credit: FEMA

Key Takeaways

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

To reduce flood damage inside of a structure, shields can be installed on the un-sealed openings.

Shields/barriers cover the un-sealed openings on the exterior walls of the structure to reduce the amount of water infiltration. They transfer flood-induced forces to the surrounding exterior walls and help prevent water from entering the building.



Photo credit: PS Flood Barriers



I-ADAPT

Exterior Adaptation

Commercial Floodproof Barrier/Shield

Estimated Costs/Benefits

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

Potential Costs		Potential Benefits		
Item	Estimate	Post-Flood Recovery Actions	Estimate	
Lift-out shield/panel (install manually before flooding)	\$3,000- \$5,000	Flood damage recovery (professional clean-up, mold removal, replacement/repair of flood damaged items)	1 inch water	\$10,800- \$53,500+
OR			↓	↓
Hinged shield (a closing door, shut manually before flooding)	\$20,000- \$30,000			
Installation	\$40-\$80/sq ft		3 feet water	\$39,800- \$185,700+
OR				
Self-closing (passive) shield (closes on its own when flooding begins)	\$24,000- \$40,000			
Installation	\$40-\$80/sq ft			
ESTIMATED TOTAL COST PER 72-inch doorway	\$3,000- \$41,920	ESTIMATED TOTAL SAVINGS	\$10,800- \$185,700+	

Potential Funding Opportunities

- [FEMA Flood Mitigation Assistance Grant](#)
- [Building Resilient Infrastructure and Communities \(BRIC\)](#)

Additional Resources

- [FEMA Homeowner's Guide to Retrofitting \(Chapter 8\)](#)

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

Expected Maintenance

- Periodically check the shields and wall fixtures to ensure they have not corroded or been damaged in any way.
- Inspect the shield systems monthly to ensure they are functioning properly.

Additional Actions

- Apply waterproof sealants on exterior walls of structure.
- Potentially purchase/rent a sump pump to remove water that has infiltrated.
- Shields may have to be manually installed immediately before each flooding event.

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

- Design professional or engineer
- General 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

