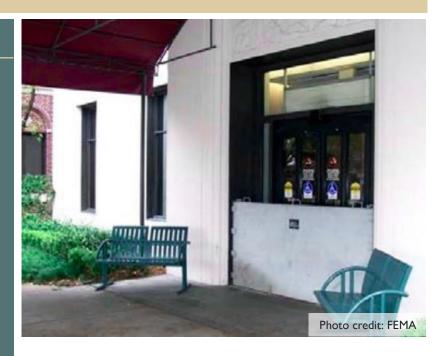
# **Commercial Floodproof Barrier/Shield**

#### **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.



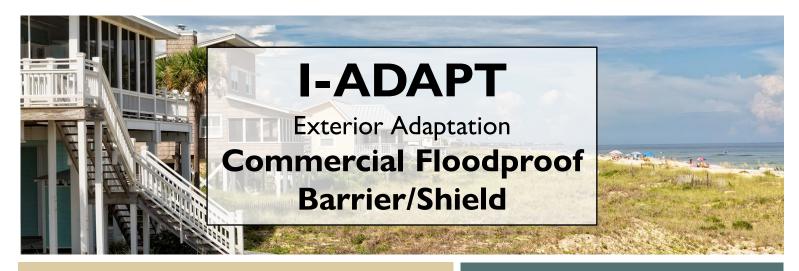
## **Key Takeaways**

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.





#### **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		1 inch	\$10,800-
OR			water	\$53,500+
Hinged shield (a closing door, shut manually before flooding)	\$20,000- \$30,000	Flood damage recovery (professional clean-up, mold removal, replacement/		
Installation	\$40-\$80/sq ft			
OR		repair of flood	↓	\
Self-closing (passive) shield (closes on its own when flooding begins)	\$24,000- \$40,000	damaged items)	3 feet water	\$39,800- \$185,700+
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**

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

#### **Additional Resources**

FEMA Homeowner's Guide to Retrofitting (Chapter 8)

Resources can also be found at <a href="https://de.gov/iadapt">https://de.gov/iadapt</a>

### **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.



