Floodproof Barrier/Shield

Overview

- Shields can be used in combination with sealants to provide protection from a maximum of three feet of flooding on non-reinforced concrete block walls.
- Plate shield types:
  - Long-duration flooding: steel or aluminum
  - Short-duration flooding: marine grade plywood
- Shield stiffeners may be necessary for structures with larger opening sizes.
- As this measure is typically a temporary flood-damage prevention measure, installation of the shield should be designed to be quick and easy.
- Prior to flood events, shields will need to be placed after vacating the structure.
- Some shields can be permanent if they are designed as a hinged plate or a mini-floodwall at sub-grade openings.

Design Considerations:

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

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

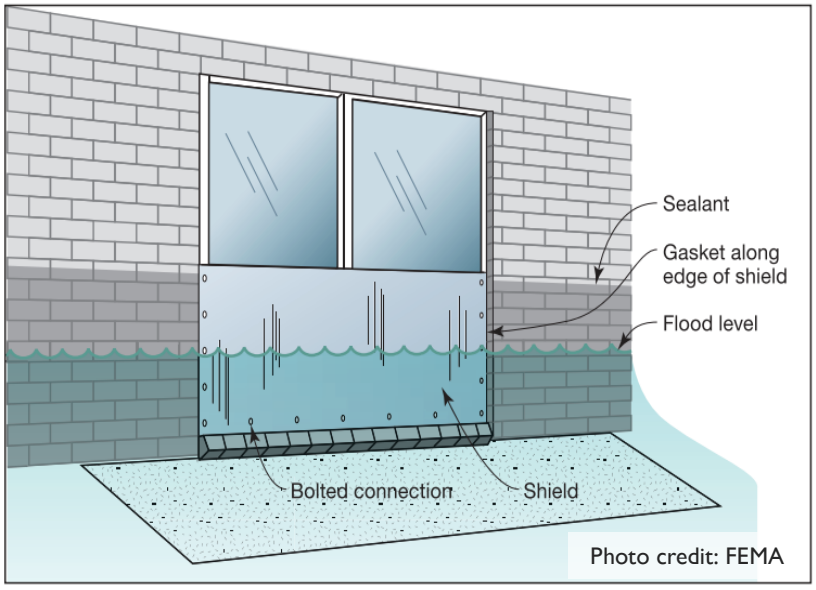
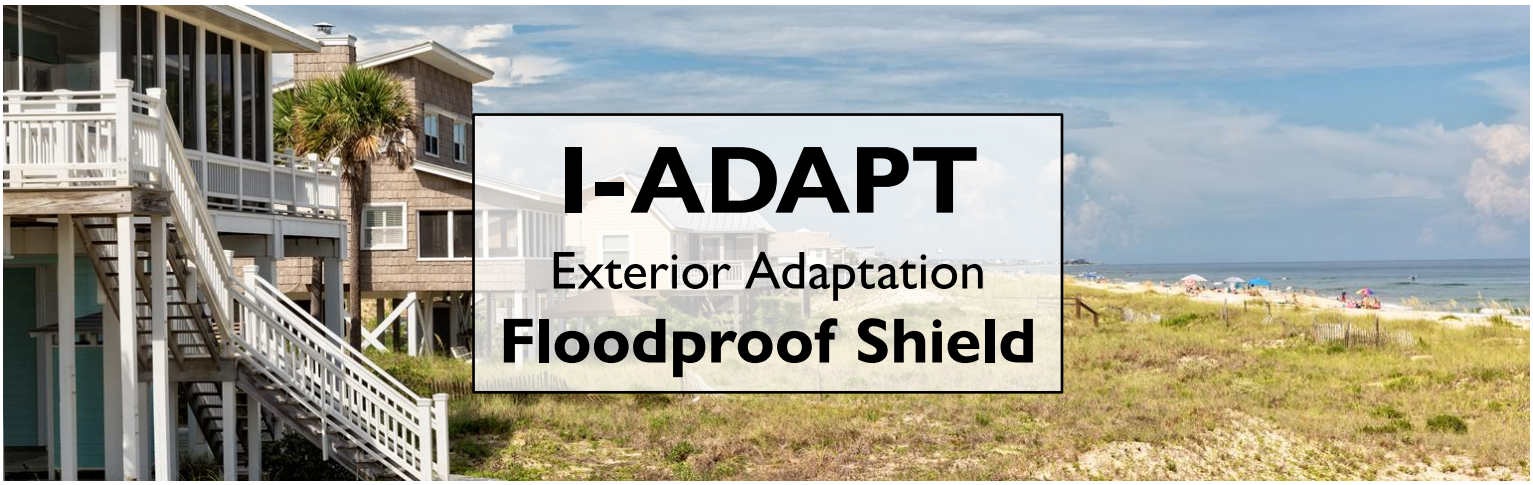


Photo credit: FEMA



I-ADAPT

Exterior Adaptation

Floodproof Shield

Estimated Costs/Benefits

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

Potential Costs		Potential Benefits		
Item	*Estimate*	*Post-Flood Recovery Actions*	*Estimate*	
Aluminum shield	$75-$900	Flood damage recovery (professional clean-up, mold removal, replacement/ repair of flood damaged items)	1 inch water	$10,800-$53,500+
OR				
Steel shield	$300-$1,000			
OR				
Marine grade plywood (sealed with wood sealer, waterproofing sealant, and stain)	$155-$200		3 feet water	$39,800-$185,700+
Quick Dam water barrier	$30-$160			
AND				
Shield stiffeners/support posts	$80			
ESTIMATED TOTAL COST PER DOORWAY	**$75-$1,080**	**ESTIMATED TOTAL SAVINGS**	**$10,800-$185,700+**	

Additional Resources

- FEMA Engineer Principles and Practices for Retro-fitting Flood-Prone Residential Structures (FEMA P-259)
- FEMA Flood Mitigation Assistance Individual Flood Mitigation
- FEMA Homeowner's Guide to Retrofitting (Chapter 8)

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

Potential Funding

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

Expected Maintenance

- Periodically check shields and fixtures to ensure they have not corroded or have been damaged.

Additional Actions

- Apply waterproof sealants on exterior walls of structure.
- If installed as a temporary measure, shields will have to manually be 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
- Floodproofing 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