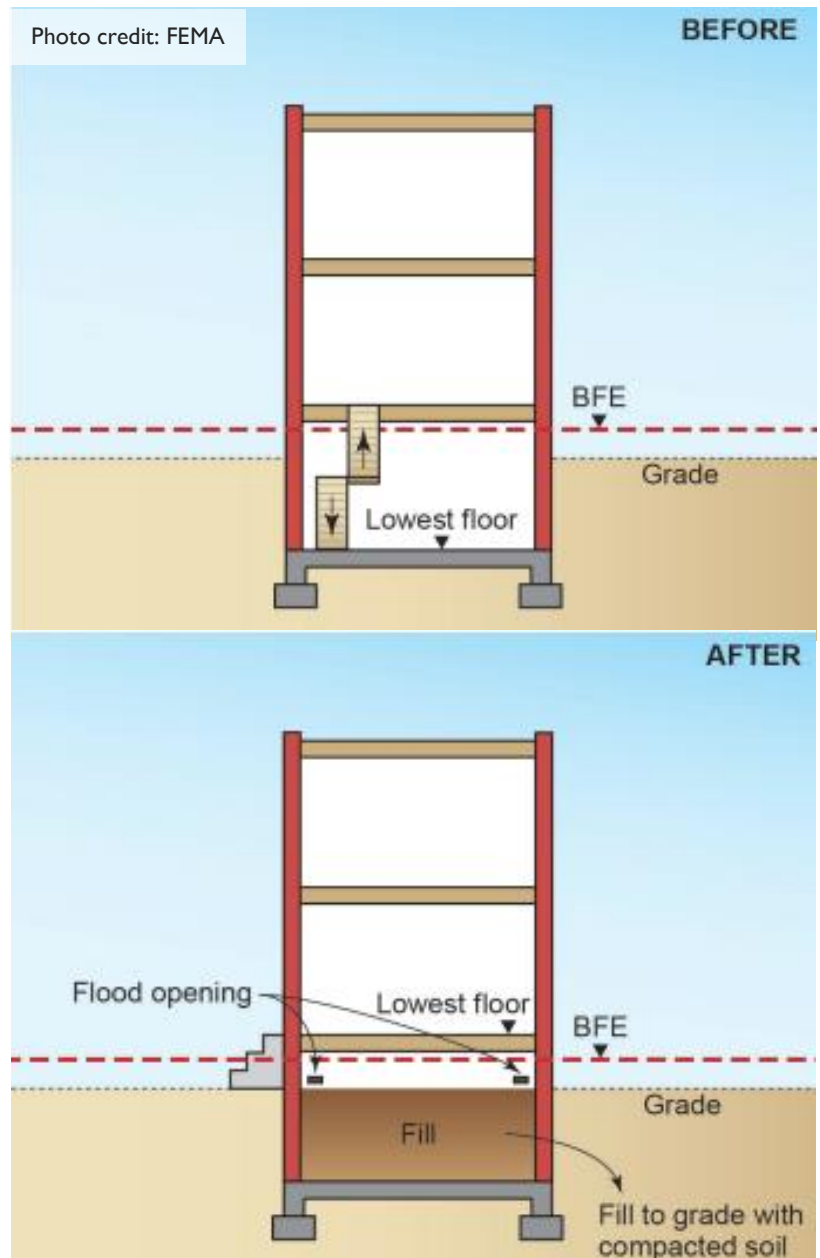


Fill in Basement

Overview

- Basements can be filled in with dirt if the first floor above grade level is above the Base Flood Elevation line (BFE) and the structure experiences basement flooding.
- This measure raises the structure's new lowest floor to or above the BFE.
- By filling the basement with sand or dirt fill, the lateral pressure from surrounding soils on the exterior walls is countered. This stops foundation wall movement during flooding.
- Basements are generally filled by inserting a chute through a window or wall opening in order to pour the fill into the basement. A plate compactor must be used to compact the fill every few inches.
- Any basement walls which remain above ground level must be retrofitted to allow automatic floodwater entry/exit through flood openings.
- All utility systems and associated equipment located in the basement will need to be moved to a higher floor.
- This measure may decrease the livable space of the structure.
- To fill the basement, the structure cannot have been categorized as substantially improved or substantially damaged.
- New NFIP flood insurance premiums will be rated on the new lowest floor level, which may decrease the structure's NFIP premium.



Key Takeaways

During flood events, flood water entering a building's basement can cause significant damage to living space as well as the building's foundation.

Furniture and utility equipment may float, which can cause more damage to the structure's interior.

To avoid continuous replacement or repair costs related to flood damaged or destroyed furniture, utilities and living space, the basement can be filled in with sand or soil.



I-ADAPT

Interior Adaptation Fill in Basement

Estimated Costs/Benefits

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

Potential Costs		Potential Benefits		
Item	Estimate	Post-Flooding Recovery Action	Estimate	
Move utilities to the new first floor	\$3,450-\$12,850	Flood damage recovery (professional clean-up, mold removal, replacement/repair of flood damaged items)	1 inch water	\$10,800-\$53,500+
Install flood vents (8-10)	\$265-\$605/vent		↓	↓
Insulate the new ground floor	\$600-\$4,500		↓	↓
Permanently close off basement door	\$250-\$600		↓	↓
Reinforce remaining walls	\$2,300-\$12,000		4 feet water	\$43,400-\$203,300+
Fill basement	\$4,000-\$10,000			
ESTIMATED TOTAL COST (1,000 sq ft basement)	\$12,720-\$46,000	ESTIMATED TOTAL SAVINGS	\$10,800-203,300+	

Expected Maintenance

- Periodically ensure that flood openings are functioning.

Additional Resources

- [FEMA Reducing Flood Risk to Residential Buildings That Cannot Be Elevated](#)
- [FEMA Principles and Practices for the Design and Construction of Flood Resistant Building Utility Systems](#)

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

Additional Actions

- Potentially add on a lateral addition or an additional floor if more living space is desired.

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
- [DNREC Coastal Construction Permit](#)

Who to Contact

- General contractor
- Utility companies



Photo credit: StockImages

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

