Waterproof Veneer on Exterior Walls

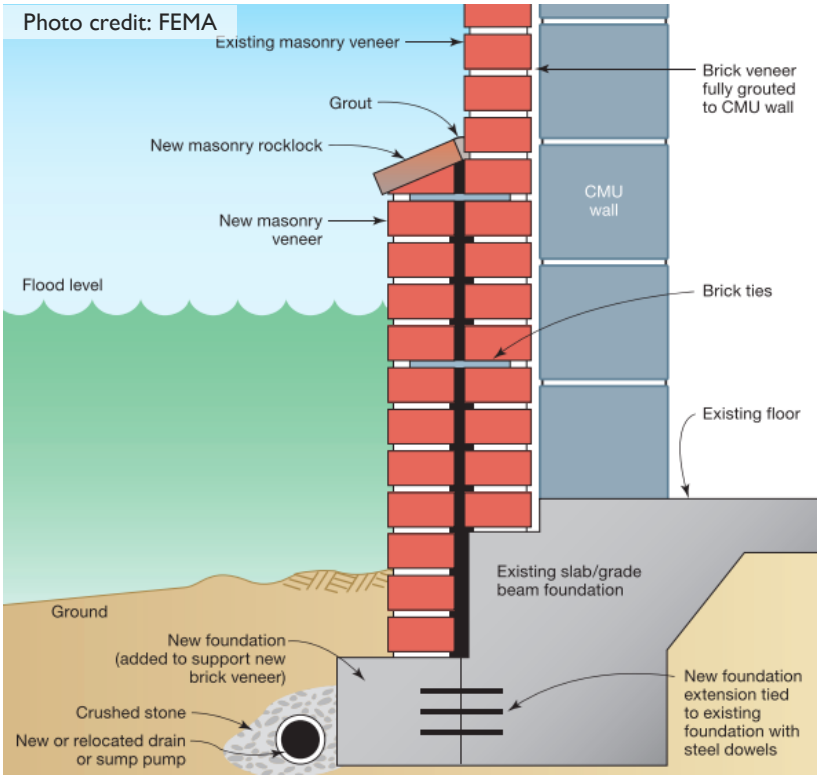
Overview

- Waterproof veneer can be added to the exterior walls of a structure to help make the building watertight against low-level flooding.
- Waterproof veneer is a layer of brick or other masonry material backed with a waterproof membrane.
- Before adding veneer, the siding of the structure must be removed and replaced with exterior grade plywood sheathing.
- The footing of the foundation may need to be extended in order to support the veneer.
- The interior walls of the structure must also be modified to resist water damage (e.g. waterproof insulation, any wood is replaced with exterior grade lumber, etc.).
- This measure should not be used if more than 2 feet of flood water is possible or if floodwaters last for more than 12-24 hours.
- As it will not block all seepage, a drainage system including a sump pump as well as backflow valves for utility pipes are required.
- This is one of several dry floodproofing measures. Dry floodproofing measures are more successful when used together. Therefore, doors/windows should also be closed off with permanent or temporary shields.

Design Considerations:

- A design professional or engineer must determine whether the building's walls and floor slab can withstand the loads generated by anticipated flood waters.
- Design professional/engineer must consider the underlying soil type since it will determine how quickly water percolates through the perimeter of the structure.

Photo credit: FEMA



Key Takeaways

During flood events, water that enters a structure can damage the structure itself as well as personal property inside the building.

To avoid flood damage inside of a structure, waterproof veneer can be installed. Waterproof veneer is a dry floodproofing measure that can be installed to the exterior of the structure to help prevent floodwaters from percolating through the building.

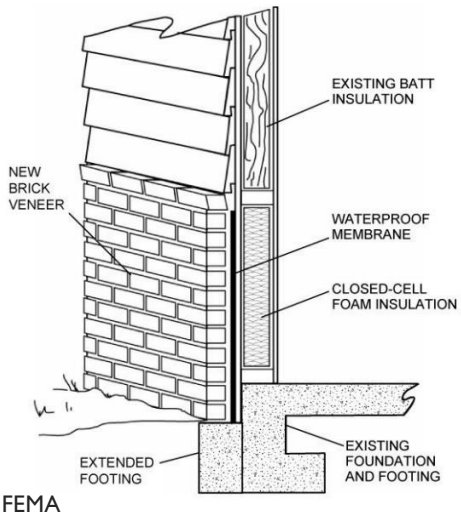
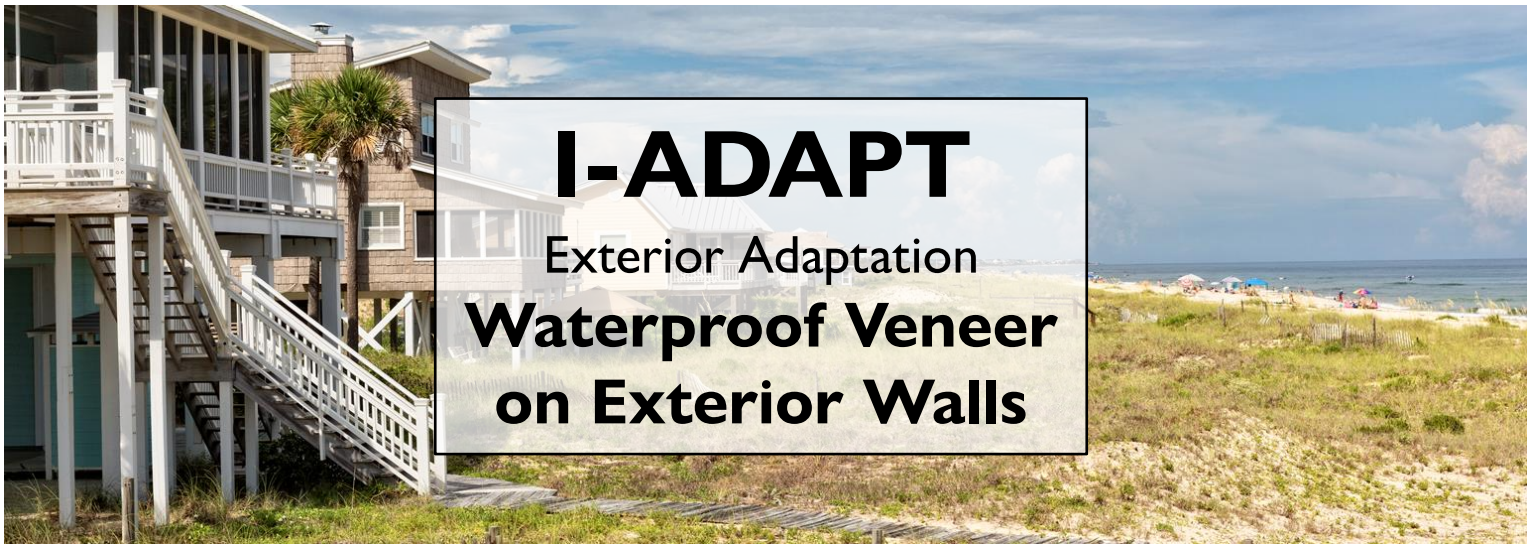


Photo credit: FEMA



I-ADAPT

Exterior Adaptation

Waterproof Veneer on Exterior Walls

Estimated Costs/Benefits

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

Potential Costs		Potential Benefits		
Item	*Estimate*	*Post-Flood Recovery Actions*	*Estimate*	
Waterproof veneer materials and installation	$10-$15 per square foot	Flood damage recovery (professional clean-up, mold removal, replacement/ repair of flood damaged items)	1 inch water ↓ 2 feet water	$10,800-$53,500+ ↓ $37,000-$171,800+
Design professional/engineer	$300-$4,000			
Backflow valves (2 – sewer and water lines)	$100-$1,700 per line			
Interior drainage system with sump pump	$2,000-$10,000			
ESTIMATED TOTAL COST 1,000 sq ft structure	**$6,700-$23,700**	**ESTIMATED TOTAL SAVINGS**	**$10,800-$171,800+**	

Expected Maintenance

- Waterproof veneer must be inspected annually as well as prior to and post flooding for cracks or damage.

Additional Resources

- FEMA Engineer Principles and Practices for Retro-fitting Flood-Prone Residential Structures (FEMA P-259)
- FEMA Add Waterproof Veneer to Exterior Walls

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

Additional Actions

- An interior drainage system with a sump pump is required in order to remove seeping floodwater.
- Utility backflow valves must be installed.
- Dry floodproofing measures are more successful when used together. Therefore, doors and windows should be closed off with permanent or temporary shields.

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
- Waterproofing 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