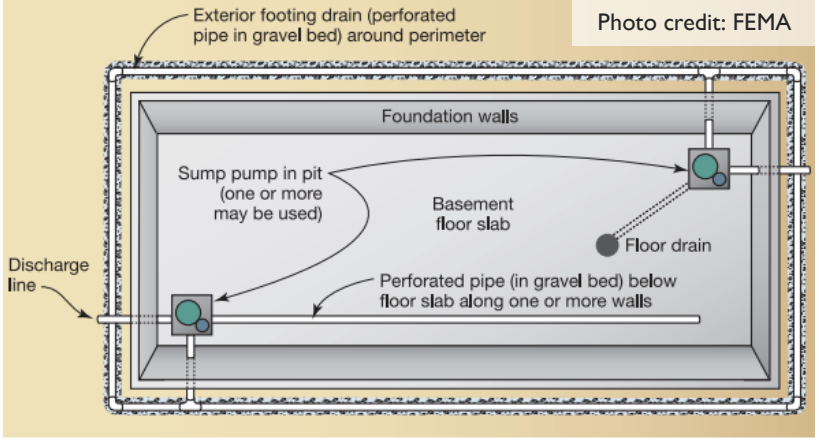
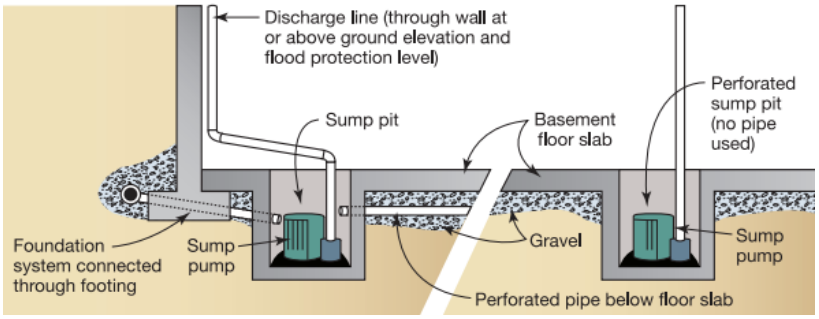
Exterior Drainage System with Sump Pump

Overview

- Exterior drainage systems are designed to remove pooling water on the outside of the structure. This may help prevent foundation walls or the floor from collapsing inward.
- Exterior drainage systems are set along the structure foundation below the structure's footing. The system routes water to the sump pump, which then pumps water away from the foundation into a public drainage system (permit may be required) or a natural drainage site.
- If draining into a natural drainage site, there must be an adequate outfall. The outfall cannot be on a steep slope and should be at least 8 feet away from the foundation walls of the structure.
- Do not direct sump pump discharge towards neighboring properties or public property.
- The drains of the system are constructed with perforated plastic pipes. They are placed in a gravel filter bed with the drain holes facing upwards.
- This measure is often paired with elevating a structure or with dry floodproofing slab-on-grade structures in order to offset flooding forces.
- If the exterior drainage system is not designed correctly, the system and sump pump may not be able to handle the water quantity and flooding may occur.
- The exterior drainage system with sump pump is not intended for high-flooding events when the water table or flood waters are more than a few feet above the basement floor or the lowest floor.

Photo credit: FEMA





Key Takeaways

During flood events, water may collect near a structure or in the structure's basement or lowest floor.

Additionally, floodwaters may exert pressure on the foundation walls and floors.

To avoid flood damage costs in areas experiencing frequent, low-level, short duration flooding, install an exterior drainage system with a sump pump.

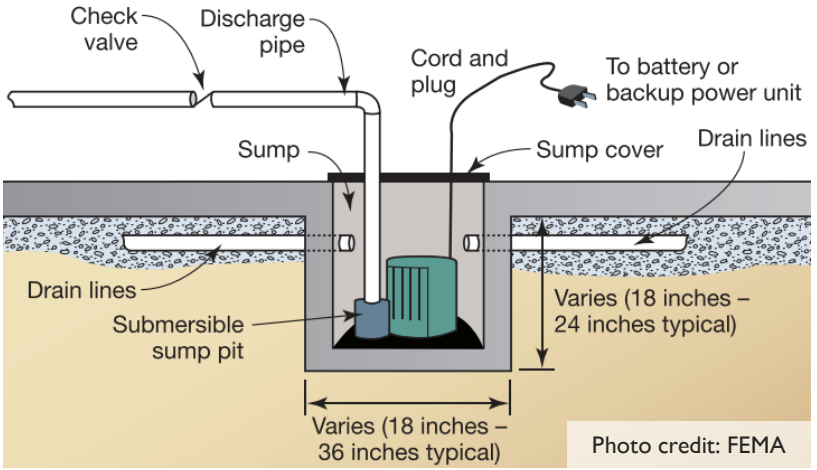
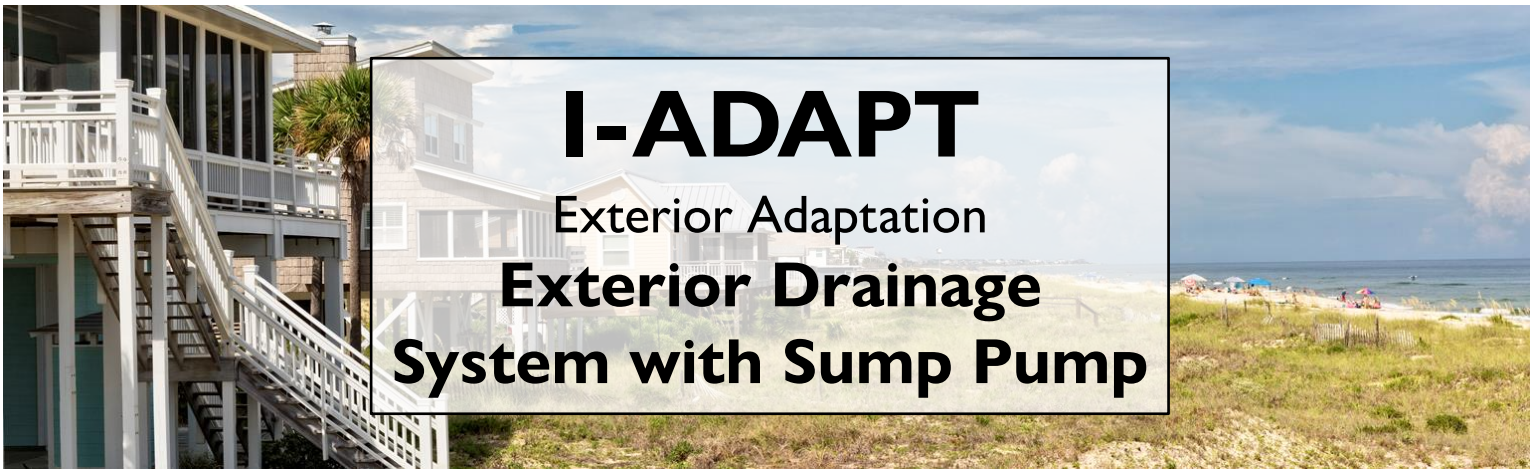


Photo credit: FEMA



I-ADAPT

Exterior Adaptation

Exterior Drainage System with Sump Pump

Estimated Costs/Benefits

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

Potential Costs		Potential Benefits		
Item	*Estimate*	*Post-Flood Recovery Action*	*Estimate*	
Exterior drainage system	$2,000-$10,000	Flood damage recovery (professional clean-up, mold removal, replacement/ repair of flood damaged items)	1 in. water ↓ 24 in. water	$10,800+ ↓ $36,600+
Installation	$3,600-$7,200			
ESTIMATED TOTAL COST (1,000 sq ft structure)	**$5,600-$17,200**	**ESTIMATED TOTAL SAVINGS** (1,000 sq ft structure)	**$10,800-$36,600+**	

Additional Actions

- A portable generator may need to be purchased as a back-up energy source.

Additional Resources

- FEMA Engineering Principles and Practices for Retrofitting Flood-Prone Residential Structures
- FEMA Homeowner's Guide to Retrofitting

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

Expected Maintenance

- Ensure that pump inlet is not obstructed quarterly.
- Debris removal as needed.
- Conduct maintenance based on manufacturer's guidance and any permitting requirements.
- Inspect sump pump for rust or corrosion annually.

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
- DNREC Wetlands and Subaqueous Lands Permit

Who to Contact

- 811 Call Before You Dig
- General contractor/drainage 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