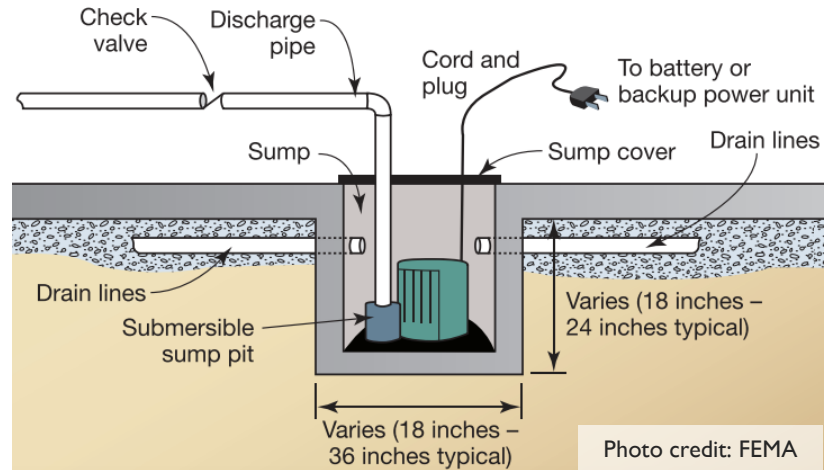


Interior Drainage System with Sump Pump

Overview

- Interior drainage systems can help to relieve hydrostatic pressure on the basement/crawlspace walls and floors.
- Floodwaters alongside the basement walls and floor moves along the path of least resistance. Interior drainage systems are designed to direct water to a sump pump. The sump pump then pumps the floodwater outside of the structure.
- To route the water, gravel-filled trenches are installed within the basement floor. Then perforated pipes are inserted which lead to the sump pump.
- The sump pump pumps water away from the structure into a public drainage system or a natural drainage site. A permit may be required for either type of drainage site.
- Do not direct sump pump discharge towards neighboring properties or public property.
- System maintenance is crucial as internal drainage systems most commonly fail due to unnoticed external causes.
- Interior drainage systems can be overwhelmed when the water table rises too quickly.
- Interior drainage systems with sump pumps are not intended for high-flooding events when the water table or flood waters are more than a few feet above the basement floor or lowest floor.



Key Takeaways

During flood events, water may seep into the structure's basement or crawlspace.

Additionally, water may exert pressure on the outside of foundation walls and floors.

To avoid flood damage costs in areas experiencing frequent, low-level, short duration flooding, install an interior drainage system with a 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	
Basement system (system, sump pump, and installation)	\$4,000-\$10,000	Flood damage recovery (professional clean-up, mold removal, replacement/repair of flood damaged items)	1 inch of water	\$10,800+
Crawlspace system (system, sump pump, and installation)	\$2,000-\$10,000		24 inches of water	\$36,600+
ESTIMATED TOTAL COST (1,000 sq ft structure)	\$2,000-\$10,000	ESTIMATED TOTAL SAVINGS (1,000 sq ft structure)	\$10,800-\$36,600+	





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Interior Adaptation Interior Drainage System with Sump Pump

Expected Maintenance

- Conduct quarterly maintenance based on manufacturer's guidance and any permitting requirements.
- Inspect sump pump for rust or corrosion annually.
- Make sure that the discharge pipe is not obstructed and that it drains completely with no residual water remaining on an annual basis.

Additional Resources

- [FEMA Engineering Principles and Practices for Retrofitting Flood-Prone Residential Structures \(FEMA P-259\)](#)
- [FEMA Homeowner's Guide to Retrofitting \(Chapter 8\)](#)

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

Additional Actions

- A portable generator may need to be purchased as a back-up energy source.
- Fill cracks in foundation. Apply sealants.

Permitting Agencies

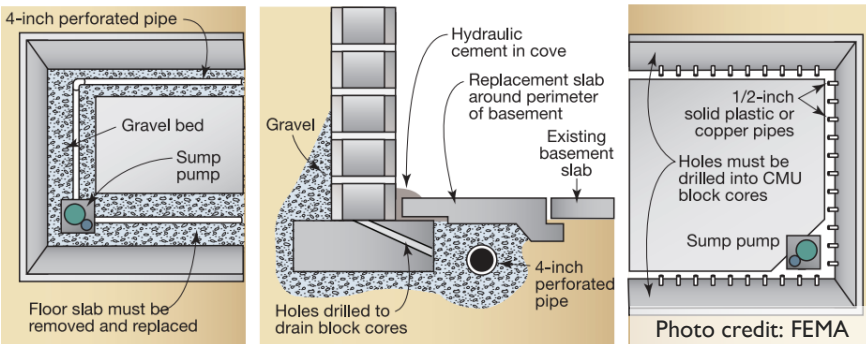
Contacts for permitting requirements include but are not limited to the following:

- Your city and/or county government for local flood ordinances or regulations
- Your city and/or county government for building permits

Who to Contact

- [811 Call Before You Dig](#)
- Drainage contractor

Underdrain system below basement floor slab



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

