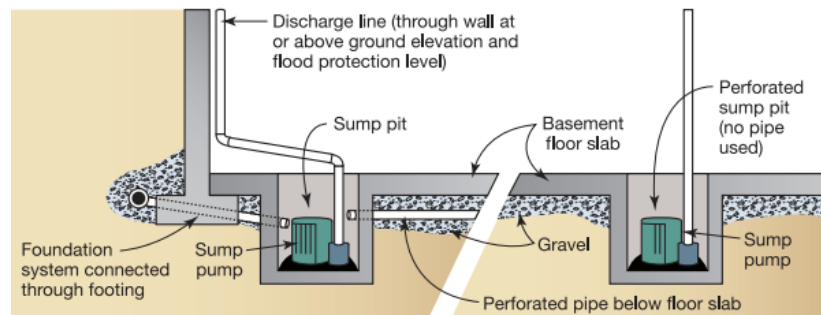
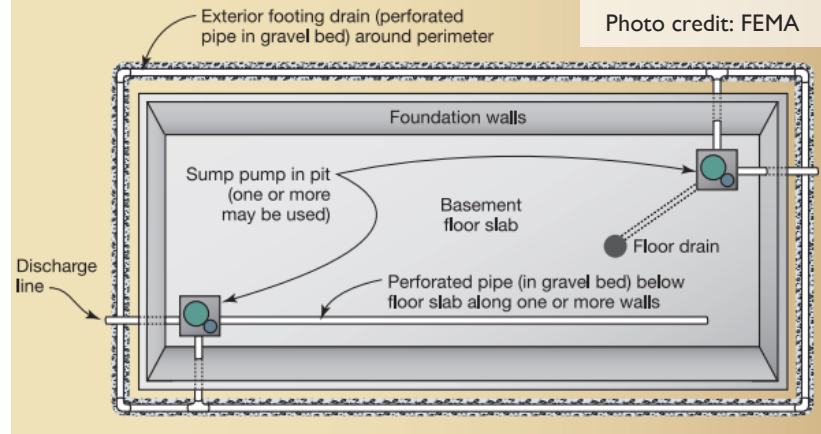


Exterior Drainage System with Sump Pump

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.

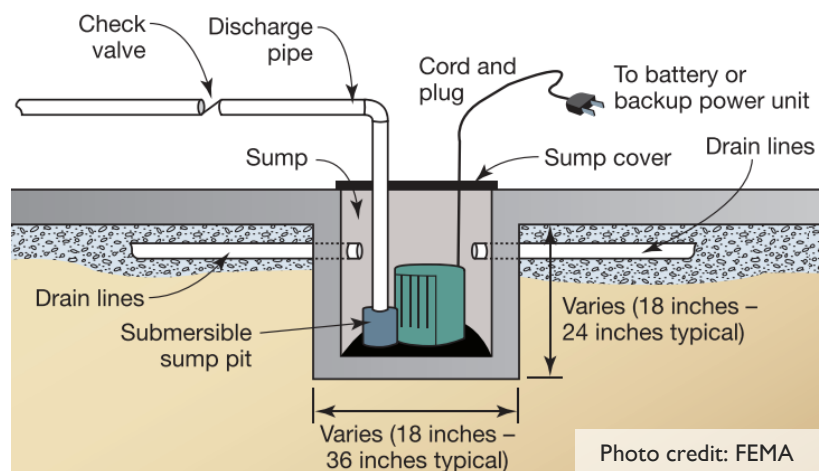


Key Takeaways

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.



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 ↓ \$10,800+
Installation	\$3,600-\$7,200		24 in. water ↓ \$36,600+
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>.



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

