Adaptation

Install Backflow Valves

Overview

- If a structure has sanitary sewer and/or stormwater drainage systems below the Base Flood Elevation line (BFE), backflow valves can prevent sewage and water from backing up and flowing into the building.
- Installation of backflow valves can prevent health hazards as well as flood damage.
- Backflow from a combined sewer system can have health risks as well as flood risks. Therefore, structures with combined sewer systems are even more likely to need backflow valves.
- A backflow valve has an internal hinged plate that opens in the normal direction of the pipe flow. When the flow is reversed during flood events, the plate closes over the inlet of the valve.
- The effectiveness of backflow valves can be limited by debris or soil build up on the internal mechanism. Therefore, periodic maintenance is required.
- The valve normally has a removable cover to provide access.
- Installation of a backflow valve can have varying degrees of complexity as some pipes will be more difficult to reach than others. Therefore, it is recommended that a plumber installs the backflow valve.
- Backflow valve types:
  - Backflow valves with a shear gate mechanism - enables manual closing of the drain line when flooding is likely to occur.
  - Ball float check valve - placed at the bottom of a floor drain and prevents water flowing up through the drain.
  - Systems with ejector pump attachments- pump sewage around the backflow valve which forces it into the sewer.



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Key Takeaways

Flood waters can cause backups inside the sanitary sewer line and/or stormwater drainage systems that drain away from the building.

This can cause an overflow of sewage or stormwater inside of the structure, which can be hazardous and costly to clean up.

To reduce clean-up, replacement, or repair costs related to sanitary sewer or stormwater drainage system backups during flood events, backflow valves can be installed in all sewer and drainage pipes.



I-ADAPT

Interior Adaptation

Install Backflow Valves

Estimated Costs/Benefits

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

Potential Costs		Potential Benefits		
Backflow Valve Types (not all valves are necessary for all structures)	*Estimate per Valve*	*Post-Flooding Recovery Action*	*Estimate*	
Sewer line backflow valve including installation	$200-$300	Flood damage recovery (professional clean-up, mold removal, replacement/ repair of flood damaged items)	1 inch water ↓ 3 feet water	$10,800-$53,500+ ↓ $39,800-$185,700+
Basement floor drain backflow valve including installation	$150-$1,000			
Sprinkler system backflow valve including installation	$100-$400			
ESTIMATED TOTAL COST	**$100-$1,700**	**ESTIMATED TOTAL SAVINGS**	**$10,800-$185,700+**	

Additional Actions

- Equipment and furniture may need to be moved permanently away from interior drains.

Additional Resources

- FEMA Engineering Principles and Practices for Retrofitting Flood-Prone Residential Structures (FEMA P-259)
- FEMA 9.0 Protecting Service Equipment

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

Permitting Agencies

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

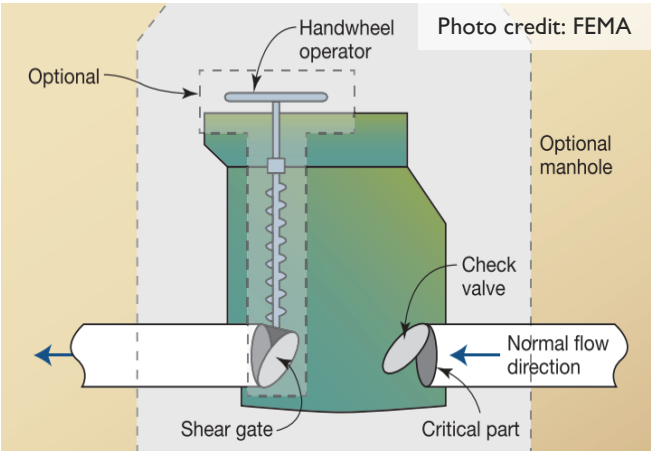
- Your city and/or county government for local flood ordinances or regulations
- Your city and/or county government for building permits

Expected Maintenance

- Periodically check the valve to ensure it is functioning properly and is not clogged with debris or soil.

Who to Contact

- Plumber



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