Selecting temporary flood barriers

CSA Group's technical specification CSA TS-227:26 provides guidance to help enhance the efficiency of flood emergency response in Canadian communities

Temporary flood barriers are physical protection systems that can help reduce the risk of flood waters damaging structures, infrastructure, and cultural assets.

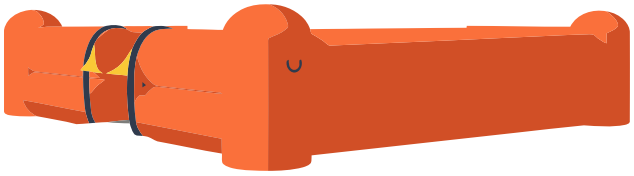
Types of temporary flood barriers

Temporary portable barriers

Portable barriers

not permanently attached to a structure or landscape, can be easily moved from one location to another, and set up quickly

Examples: *pre-deployed, water or foam-filled, inflatable, self-filling, and container barriers*



Self-activating portable barriers

typically installed at openings, roadways, or doorways, and automatically deploy when exposed to water

Examples: *self-filling and self-emptying, horizontal expansion, and flotation barriers*



Temporary fixed barriers

Fixed demountable barriers

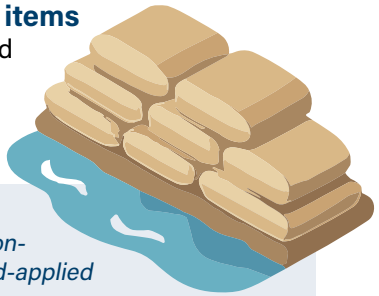
use fastening devices permanently or temporarily attached to buildings, to which the barriers can be installed before flooding and removed after the event



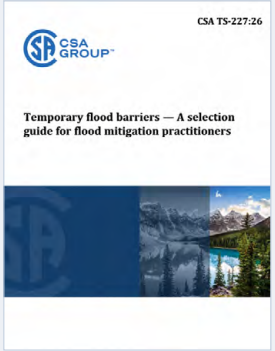
Examples: *such as panel-style, opening barriers, and log systems,*

Specialty application items

can provide focused flood protection for small openings, vents, and mechanical systems



Examples: *sandbags, content bags, penetration-sealing devices, or liquid-applied sealing products*



Get CSA TS-227:26 at no fee

For comprehensive guidance on selecting, deploying, and maintaining the appropriate type of emergency flood barriers, get the technical specification CSA TS-227:26, *Temporary flood barriers — A selection guide for flood mitigation practitioners*.

www.csagroup.org/TFBselection

Considerations for selecting temporary flood barriers

Flood types and characteristics



Coastal flooding typically driven by waves or tides, with debris consisting of sediment and large and heavy objects driven by wind



Riverine flooding dominated by strong, fast currents, with debris including sediments, branches, and large and heavy objects



Rural flooding characterized by slow flow velocities, with water spreading over a large area and small to moderate debris from natural and rural materials



Urban flooding typically higher runoff rates with moderate to high current speeds and lower standing water depth, and small debris, including branches, construction material, and small household objects

Site characteristics



Type of soil or strata on which the surface barriers are deployed



Above and below-ground infrastructure that can impact transportation and deployment of barriers on site, the feasibility of installing barrier fasteners, or that might be affected by the barriers



Adjacent property influences that may impact floodwater flow and debris movement



Protected asset properties such as the capacity of the asset's exterior wall to withstand the flood forces, and potential exposure of basements and crawlspaces to surface or below-surface flooding

CSA TS-227:26 provides guidance for defining the type of flooding that might pose a hazard to assets.

Other considerations



Conditions before a flood event such as strong wind may displace or disrupt barriers



Conditions during a flood event such as potential for overtopping flows



Potential for cascading failures when a failure of one protective measure can create conditions for another protective measure(s) to fail



Installation, deployment, removal, and cleanup including time required for deployment of barriers before flooding, site logistics, crew competency, maintenance, and storage requirements



Funding considerations related to acquiring the barriers, as well as their maintenance, replacement, and storage



Risk, insurance, and liability considerations related to barrier performance and logistical challenges that may affect barrier reliability

Five steps of selecting temporary flood barriers

These steps apply in scenarios with sufficient time and resources to evaluate and select temporary flood barriers. If a threat to life and property is imminent, decision-makers or qualified professionals should consider as many factors as reasonable under the circumstances, with priority given to timely deployment.



Step 1:

Collect available information

Use online sources, such as topographical maps, LiDAR data, Google Earth satellite and air photography, weather services, flood maps, and historical flood data to determine the anticipated floodwater characteristics. Collect data in a standardized form for consistency, repeatability, and verification.

CSA TS-227:26 provides a sample desktop data collection form.

Step 2:

Shortlist barrier types and services

Determine which types of temporary flood barriers can protect the asset based on information collected in Step 1.

CSA TS-227:26 provides examples of selection criteria highlighting suitable versus less suitable barrier types.

Step 3:

Perform visual site inspection

Gather additional information about the placement area relevant to the types of barriers selected in Step 2.

CSA TS-227:26 provides detailed guidance on visual site inspection considerations.

Step 4:

Conduct in-depth technical analysis of the site

Engage qualified professionals to determine the compatibility of the shortlisted barrier types with the placement area. This should include geotechnical investigation and geodetic survey, hydrological assessment, assessment of external loading, such as wind, snow, and ice, the projected extent of damage in a given flood scenario, and structural investigation of the site.

CSA TS-227:26 provides an overview of barrier compatibility based on various floodwater and site characteristics.

Step 5:

Engage contractors and suppliers

Include information collected in the previous steps in requests for proposals and quotes, and clearly specify the information that contractors and suppliers should provide to support the decision-making process.

CSA TS-227:26 provides a summary of information that suppliers and contractors should include in their proposals and quotes

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