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FLOOD RESILIENCE GUIDE

Steps to plan, prepare and respond.

Introduction

Across Canada, the frequency and severity of climate change-related events are increasing, with more examples each year of wildfires, drought, extreme heatwaves, and flooding. Flooding events affect more people globally than any other type of natural hazard and can occur year-round and in any region. They are often caused by heavy rainfall, rapid melting snow and ice, or failure of a natural or human-made dam.

For Canadian businesses, extreme weather can cause significant damage, not only to buildings, but to operations, through supply chain interruptions, displacement of labour force, and health and safety risks.

To effectively manage climate impacts, implementing flood resilience measures is critical to prevent a flood from resulting in a costly loss. Preparing ahead of time for flood preparedness, management, and event response can lessen the impact of a flooding event. Ultimately, taking the necessary steps before, during, and after a flood can make the difference between a minor disruption and a disaster your business can't easily recover from.

Did you know?

Our experienced Risk Services consultants can assist in understanding your operation's specific flood risk and providing reasonable actions to manage flood-related exposures and hazards. Offering proven strategies and industry best practices, our Risk Services team can help you protect your business and minimize the potential for a flood-related loss.

Contact a licensed insurance broker today to make sure you have the right flood coverage for your business.

Special thank you to the **Institute for Catastrophic Loss Reduction**[1] and the **Faculty of Environment at the University of Waterloo**[2] for the research and insight in creating this resource.

[1] iclr.org
[2] uwaterloo.ca/environment



Know your risk and be prepared

Flood awareness

There are three common types of flood conditions that can occur. Each type of flood can be predicted in different ways, and the approach to preparing or preventing each type can also vary. It's important to note that regardless of where your business is located, there's always a possibility you could be affected by a flood.

Fluvial flood (river flood)

Fluvial, or riverine flooding, occurs when excess water flows into a river channel, causing flooding of the land around the breached natural banks. Most common in early Spring, riverine flooding is the result of extreme rainfall, snowmelt, and physical conditions (e.g., ice, sediment and debris jams, watercourse configuration changes, and capacity limitations).

Pluvial flood (surface flood)

Pluvial, or surface water flooding, is caused by an extreme rainfall event that can create a flood independent of an overflowing water body, such as a flash flood or surface flood. This event can happen in any urban area. The intense rainfall can overwhelm drainage systems, streets, and structures.

Coastal flood (storm surge)

A coastal flood, or storm surge, is caused by an abnormal rise in water levels that often follows hurricanes, high winds, or typhoons. The severity of a coastal flood is determined by several other factors, including strength, size, speed, and direction of the windstorm.

Measures to enact before a flood

Plans and procedures

- Make sure emergency preparedness and response plans are in place and include flood event procedures. Plans should be fully documented and readily available in an emergency.
- Provide training to all building operations staff on flood event procedures. Perform annual practice drills with staff and regularly review all procedures to make sure they're up to date.
- Allocate dedicated funds for emergency operations, including flood events. Designated staff should also have access to credit cards and sufficient amounts of cash to be used for emergency operations.
- Establish tenant, stakeholder, and customer communication channels (such as mass notification systems and social media channels) for emergency situations, including flood events. Regularly update records of tenant's or stakeholder's contact details.
- Designate space for building operations staff to use as emergency operations centres. Supply this space with water, non-perishable food supplies, and emergency kits and make sure that it's in an area not exposed to flooding.
- Establish standing orders with fuel suppliers, restoration, and landscaping companies to provide goods and services at pre-arranged prices, under set terms and conditions, and as required for flood events. Consideration should also be given to developing a list of secondary suppliers if the primary suppliers aren't available.
- Establish documented procedures to shut down equipment that may be affected by a flood.
- Maintain and regularly review the contact information of risk management personnel, insurance adjusters, and insurance brokers.

Equipment and supplies

- Provide critical equipment and supplies onsite to respond to flood emergencies, such as reusable sandbags, submersible sump pumps, portable generators, fuel, portable lights, extension cords, air dryers, air moisture sensors, dehumidifiers, protective clothing, two-way radios, batteries, and medical supplies.
- Provide access to portable flood barriers and sandbags to protect key vulnerable areas within the building from overland flooding.
- Make sure onsite backup generation equipment and fuel are available and have the capacity to provide electrical power to at least one elevator, all building sump pumps, heat pumps, boilers, smoke evacuation fans, fire sprinklers, fire alarm systems, stairwell pressurization systems, and emergency lighting equipment for 24-72 hours. Regularly inspect and test back-up generation systems.
- Outfit critical mechanical and electrical rooms, as well as emergency stairwells or other evacuation routes, with battery-operated emergency lighting to function if back-up generation equipment malfunctions. Regularly inspect and test all battery-powered lighting.
- Equip elevators with water sensors to prevent them from proceeding to flood-inundated building levels.
- Install backwater valves on storm and sanitary sewer pipes.
- Protect any hazardous materials from flooding (e.g., chemicals used in building operations are stored in sealed containers, or in inflammable cabinets located above expected flood levels). Make sure floor drains are protected from spills where hazardous materials are stored.

Major retrofits

While most measures below may be cost-prohibitive to implement post-construction, they may be warranted for critical sites, or during major building retrofits:

- Relocating heating, cooling, ventilation, and air conditioning (HVAC) equipment; electrical transformers, switchgear, and service panels, and communication systems to be elevated above expected flood levels. If it's not feasible to elevate, flood-proof systems which may be exposed to flooding (e.g., with equipment elevated off the ground and drains at the lowest points on the floor).
- Locate server rooms on higher floors, preferably on a raised platform, with a sump pump installed at the lowest point. Install water sensors for leak detection.
- Waterproof high-voltage and telecommunication pull rooms and make sure there's adequate drainage.
- For Canadian businesses, taking steps before a flood occurs can help reduce property damage, business interruptions, illness, and injury.

Measures to enact during the flood

During a flood event, it's crucial to stay safe, prioritize the health and safety of all onsite personnel, and follow emergency procedures and instructions from local authorities.

- If evacuation orders are issued all onsite personnel must leave the premises immediately, including employees, tenants, customers, visitors, and vendors.
- Prohibit non-emergency response personnel from entering floodwaters (one foot of water can sweep away a vehicle and hazardous materials can enter the water easily).
- Follow the documented procedures to shut down equipment that may be affected by the flood. This includes shutting off electrical equipment and flammable liquid lines at the source (except for emergency generators and fire pumps). Do not energize until a licensed electrician inspects this equipment for damage.
- Fill up fuel tanks for emergency generators and fire pumps.
- Protect building doors and windows from overland flooding and debris damage (e.g., by setting up boards and sandbags).
- Protect onsite waste disposal and collection facilities from floodwater entry (e.g., through locking waste disposal bins
- Secure outdoor items (e.g., outdoor furniture landscape items, waste containers and other equipment) that can be swept away by the flood waters.
- Move machinery, equipment, and valuables to higher levels (above expected inundation).
- Where safe to do so, take photos of impacted areas for the insurance claims process. All policies are unique, so review your policy and connect with your insurance broker to make sure you have the coverage you need before the next flooding season. Need to make a claim? Contact your licensed insurance broker right away. In case of an after-hours emergency, call your insurer's emergency service line.
- Provide regular updates to personnel normally present onsite, including guidance on whether it is safe to return to the site.

Measures to enact immediately after the flood

Once the flood waters subside, the following steps should be considered:

- Check for downed power lines and fuel spills caused by the storm, and report damages to the utility providers.
- Engage qualified gas fitters and boiler service technicians to restart boilers, advising jurisdictional authorities as necessary.
- Extract water from the premises as soon as possible to reduce damage and contamination.
- Remove damaged contents and furniture; dispose of it in accordance with regulations.
- Assess structural damage through visual inspections, moisture meters, and thermal imaging to detect all moisture.
- Check for contamination to determine the required levels of cleaning and sanitation (typically this assessment is performed by an external environmental consultant).
- Clean and sanitize the property, once dried.
- Initiate drying and dehumidification process and keep daily moisture logs to measure progress.
- Test electrical, mechanical, fire protection, alarms, and other building systems; repair or replace systems as required.

Questions?

Contact a licensed insurance broker today to make sure you have the right flood coverage for your business.

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