

Flood Preparedness Guide

A Risk Management Resource for
Housing Providers

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ACKNOWLEDGEMENTS

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Property damage and associated business interruption from water infiltration is becoming more prevalent throughout Ontario. Properties located in or near designated flood regulation zones are vulnerable to spring flooding caused by a combination of snowmelt and significant rainfall. Heavy rain events can unleash massive amounts of rainfall in areas previously unaffected that can overwhelm existing municipal storm sewers causing sewers to back up into buildings. While it can be challenging to manage these events, pre-planning can help mitigate their severity and duration. The following Flood Planning Checklist provides items to consider when preparing your facility for potential flooding and can help guide the development of your own **Flood Emergency Response Plan**.

1. Planning

Where to Start

- Is the building susceptible to overland flooding or located in or near a designated flood regulation area? Is there a history of flooding in the area? If you are uncertain, consult with your local Conservation Authority.
- Consider how floodwaters could enter the building. Are basement / ground floor areas subject to water infiltration through windows, doors, parking garage ramps, HVAC ducts, sewer and storm system drains?
- Even if your facility is not located in or near a designated flood zone it may be susceptible to sewer back up and overland flooding during heavy rain events (See Additional Considerations).

Authority / Team Members

- Determine when the Flood Emergency Response Plan should be activated.
- Clearly establish who has authority to decide when: to activate the plan; to relocate inventory and equipment; to install protective measures (e.g. flood doors, sandbags and coverings); and to initiate cleanup and recovery.
- Establish which employees will most likely be able to respond to help with flood mitigation efforts (i.e. their homes are not likely to be flooded as well).
- Document names, phone numbers, and availability. Which employees will help put up flood barriers at 3:00 am?
- Which contractors will be available prior to, during, and after the flood?

Warning / Weather Monitoring

- Find out which local resources are responsible for flood forecasting (e.g., local Conservation Authority). Many cities and local conservation authorities have websites providing flood-warning updates.
- Determine the point of no return when the Flood Emergency Response Plan is initiated, even if there is a chance that flood levels may abate.
- Do not rely on flood predictions being completely exact – they are estimates only and can underestimate the magnitude of the flood.
- Obtain estimates on how long the flood may last. Inform tenants of potential evacuation and provide regular updates.

Procedure Considerations

- What factors will trigger the flood plan? Who has the authority to put the plan into motion?
- Establish procedures for when and how to:
 - Shut down electrical and natural gas utilities (to avoid fires during and immediately after the flood) and by whom? Consult with local utility providers.
 - Re-locate inventory, equipment, contents.
 - Check that existing flood measures are in place.
 - Start installing all temporary flood protection / mitigation materials.
 - Evacuate / re-locate tenants?
 - Initiate clean-up / recovery.

Assess What Could Be Damaged

- This might include walls, carpets, floor tiles, motors, control panels and circuit breakers, telephone switching rooms, computer server rooms, compressors, transformers, vehicles, basement areas, etc.
- Determine what can be relocated and where, including locating off-site. (e.g., relocate all basement and ground level inventory to higher storeys before the flood).
- Determine what can't be moved but still needs protection (e.g., motors, panels, etc.).
- Determine how best to protect these items (e.g., rustproofing compounds, sealing in plastic).
- Tenant vehicles in underground parking garage; re-locate to higher ground?

Flood Protection – Materials & Equipment Needed

- Determine which types of flood protection will be used for every point of water infiltration (e.g., sandbags, flood doors, water filled barriers) and within the building (e.g., plastic tarps, rust proofing compound).
- Make sure adequate bags are on hand. Source where sand can be obtained and have contracts in place to guarantee supply prior to the flood. Estimate the number of bags and sand for each point of water ingress.
- Ensure that an adequate number of employees will be available to help with sandbagging or installing other perimeter flood protection.
- Keep instructions for construction of a proper sandbag levee on hand or installing other perimeter protection.
- Where will the sand, bags, and other perimeter protection be stored?
- Keep rustproofing compounds in stock. Take an inventory of quantities prior to flood season to make sure enough are on hand and have not been previously used.
- Determine where and how plastic sheeting and tarps will be used since inventories may be difficult to obtain during and after a flood
- Investigate alternate flood protection methods (i.e., there are newer perimeter barriers on the market now that take much less time to set up and can be stored much more easily than sand and burlap bags).
- Determine how long it will take to set up perimeter barriers, plug floor drains and toilets, move inventory, seal doors and windows, etc. This is critical - quick rising flood waters can lay waste to sand bagging or perimeter barrier installations not installed early enough.
- Consider installing backflow preventers in drains, or at least on the main storm / sewer drains connected to the municipal system (i.e., prevent sewer backup).
- If perimeter barriers that are filled with water are used, discuss with local officials beforehand the use and access of city hydrants as water sources.
- Assemble or procure personal protective equipment (boots, waders, gloves) for Property Management / in-house maintenance staff.

Contractors / Vendors

- Establish contracts with sand suppliers that are capable of delivering when needed. Alternately, if space is available, keep needed quantities of sand on site.
- Establish contracts with third-party remediation and restoration service providers. Large fans may be required (ensure contractor or suppliers can provide them).
- Determine availability of pumps for pumping out flooded areas and establish contracts with vendors for both during and after the flood.

- Create a list of employee electricians and technicians, or electrical contractors and other contracting technicians in the plan with company names and phone numbers.
- Create a list of utility companies to assist with shutting off electricity and natural gas.

2. Before the Expected Flood: Activating Flood Emergency Response Plan

Weather

- Monitor weather reports and flood conditions provided by local authorities (previously established).
- Make the decision to enact the Flood Response Team and Plan.
- Call Response Team members to determine availability.

Preparation

- Start relocating (previously inventoried) items susceptible to water damage: inventory, electronics, vehicles, records, computer tapes and drives.
- Have employees take their laptops home.
- Shut off utilities such as electricity, natural gas.
- Re-locate tenants, if required.

Flood Protection / Mitigation

- Fill sandbags and place around (previously determined) points of water ingress.
- Install flood doors over windows and doors previously designed to accommodate these doors. Seal them with caulking.
- Cover equipment with plastic sheeting due to condensation inside building – including equipment not expected to be exposed directly to floodwater.
- Keep all property catch basins and roof / floor drains clear before and during flooding.
- Ensure sump pumps are operational.
- Close any manual back flow valves on storm or sewer lines.
- Consider setting up flood pumps prior to the flood event if enough advance warning provided.

3. After the Flood: Cleanup and Recovery

Upon confirmation with local authorities that the threat of flooding has subsided, initiate clean up and recovery operations:

- If flood waters are inside the building, perform a high-level assessment of whether the water is contaminated with biohazards or hazardous materials and potential physical hazards (e.g., submerged structural hazards or electrified submerged appliances/outlets).
- If the water is potentially hazardous, rely on in-house maintenance teams if available or coordinate with professional remediation service providers for all water removal and cleanup with appropriate disinfectant cleaning supplies.
- Rely on in-house maintenance teams if available or coordinate with flood remediation third-party service providers to remove any damaged or affected materials throughout the facility.
- Thoroughly clean equipment of water, dirt, etc. and lubricate. Remove rust proofing compound.
- Remove all accumulated combustible debris before it can dry out.
- Have dumpsters available for debris.
- Ensure availability of sump pumps to pump out basements.
- Dehumidify the building as quickly as possible. Large fans may be needed (contractor or agreement with supplier to provide them).
- Confirm the operability of all building systems (fire detection and fire suppression, elevator, ventilation, air conditioning, heat) and identify any damaged systems.
- Verify that the affected areas have been restored and are safe to reoccupy by tenants.

4. Additional Considerations

Review / Training / Update Plan

At a minimum, Flood Emergency Response Plans should be reviewed annually and include:

- Training for all employees identified in the plan.
- “Dry” run of plan that includes participation of all referenced staff (including alternates) and equipment.
- Inventory of all flood protection. Is it in good condition?

- Review of all content and assumptions (has designated flood zone changed?).
- Review of previous events (e.g., record what areas have been affected by floods in the past, what worked, what failed?).

Heavy Rain Events

While Flood Emergency Response Plans may not be necessary for all buildings, the following items should be considered for all buildings in advance of heavy rain events:

- Ensure exterior catch basins, roof drains are maintained free of obstructions at all times.
- Verify sump pumps are operational.
- Ensure storm water clean-out covers located within the building interior are securely fastened. These covers can break loose when pipe is surcharged with water.
- Be aware of flat exterior areas with poor drainage where rainwater may accumulate and enter into building (e.g., lower-level doors, windows, stairwells, parking garage ramps, etc.).
- Install back flow preventers on building storm / sewer outlets on the outside of the building (if possible and subject to local by-laws).



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