Marsh

Flood emergency response planning guide

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Introduction

Whether from overland flooding or sewer backup, property damage and associated business interruption from water infiltration is becoming more prevalent throughout the world. Spring flooding caused by a combination of snowmelt and significant rainfall can expose properties located in or near designated flood regulation zones. Heavy rain events can unleash massive amounts of rainfall in areas previously unaffected by flooding. This can overwhelm 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 impact. 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 (FERP).

Pre-planning

WHERE TO START

- Consider whether the facility is susceptible to overland flooding or located in, or near, a designated flood regulation area. Is there a history of flooding in the area? Consult with your local Authority Having Jurisdiction (AHJ).
- How could floodwaters enter the building? Are basement/ground floor areas subject to water infiltration through windows, doors, parking garage ramps, HVAC ducts, and/or 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 backup and overland flooding during heavy rain events (see Additional Considerations on page 8).

AUTHORITY/TEAM MEMBERS

- Determine when the FERP should be activated.
- Clearly establish timelines and who has authority to take certain steps, including when to activate the plan; when to relocate inventory and equipment; when to install protective measures, including flood doors, sandbags, and coverings; and when to initiate cleanup/recovery.
- Establish which employees will most likely be able to respond to help with flood mitigation efforts, considering potential issues such as whether their homes are likely to be flooded.
- Document names, phone numbers, and availability. Which employees will be helping to erect flood barriers, no matter the time of day?
- Which contractors will be available prior to, during, and after the flood?

WARNING/WEATHER MONITORING

- Determine the availability of local resources to warn of potential flooding, for example, a local Conservation Authority. Many cities and local conservation authorities have websites providing flood-warning updates.
- Determine the triggers for the FERP. Do not rely on flood predictions being exact — they are estimates only and can underestimate the magnitude of a flood.
- Obtain estimates on how long the flood may last. Inform tenants of potential evacuation, and provide regular updates.

PROCEDURES

Establish procedures for when and how to:

- Shut down electrical and natural gas utilities (to avoid fires during and immediately after the flood), as well as who will perform the tasks. Consult with local utility providers.
- Relocate inventory, equipment, contents.
- Check that existing flood measures are in place.
- Start installing all temporary flood protection/mitigation materials.
- Evacuate/relocate tenants.
- Initiate cleanup/recovery.

ASSESS POTENTIAL FOR DAMAGE

- Check walls, carpets, floor tiles, motors, control panels and circuit breakers, telephone switching rooms, computer server rooms, compressors, transformers, production equipment, full or empty tanks and drums, vehicles, basement areas, and more.
- Determine what can be relocated and where, including off site. For example, you may decide to relocate all basement and ground level inventory to higher stories before the flood.
- Determine what cannot be moved, but still needs protection, such as motors and panels.
- Determine how best to protect various items; for example, with rust proofing compounds or sealing in plastic.
- Decide whether tenant vehicles in underground parking garage should be relocated to higher ground.

FLOOD PROTECTION: NECESSARY MATERIALS AND EQUIPMENT

- Determine which types of flood protection will be used for every point of water infiltration, outside and inside buildings, including sandbags, flood doors, water filled barriers, plastic tarps, and rust proofing compounds.
- Make sure an adequate number of sandbags are on hand and have a source(s) from which to obtain sand, as well as contracts in place to guarantee supply prior to a flood. Estimate the number of bags and sand for each point of water ingress.
- Ensure adequate numbers of employees will be available to help with sandbagging or installing other perimeter flood protection.
- Keep instructions at hand for construction of a proper sandbag levee or other perimeter protection.
- Determine where the sand, bags, and other perimeter protection will be stored.
- Inventory rust proofing compounds in stock before flood season and ensure enough is on hand.
- Plastic sheeting and tarps may be difficult to obtain during and after a flood. Determine where and how they will be used.
- Investigate alternate flood protection methods, including newer perimeter barriers that take less time to set up and can be more easily stored 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, and conduct other work. This is critical as quick rising floodwaters can lay waste to sandbag or perimeter barrier installations that are not installed early enough.
- To prevent sewer backup, consider installing backflow preventers in drains, or at least on the main storm/sewer drains connected to the municipal system.
- If using perimeter barriers filled with water, discuss with local officials beforehand your ability to access city hydrants as water sources.
- Assemble or procure personal protective equipment — including boots, waders, and gloves — for property management/in-house maintenance staff.

BUILDING MODIFICATIONS

- Consider permanently relocating important equipment — for example, high-value electronics, computer servers, telephone equipment, and electrical panels — located in basements or below expected flood levels to higher floors or above the flood line.
- If equipment cannot be relocated above expected flood levels, consider sealing the entire building envelope.
- Install permanent flood barriers, including berms and dykes, around susceptible outdoor equipment that cannot be moved, such as transformers.
- Secure tanks and relocate storage drums that could float away.
- Consider installing an electrical connection so that a temporary generator can be quickly connected to the building's emergency power system. This can back up emergency generators that are located in basement areas susceptible to flooding and maintain emergency power to life safety systems, including electric fire pumps.

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 for such equipment as large fans.
- Determine availability of pumps for removing water from flooded areas and establish contracts with vendors for both during and after the flood.
- List employee electricians and technicians, or electrical contractors and other contracting technicians, in the plan with company names and phone numbers.
- List utilities companies to assist with shutting off electricity and natural gas.

Before the expected flood

MONITORING

- Monitor weather reports and flood conditions provided by local authorities, as previously established.
- Make the decision to activate the flood emergency response team and plan.
- Call members to determine availability.

PREPARATION

- Start relocating items susceptible to water damage. These should have been previously inventoried, and include inventory, electronics, vehicles, records, and computer tapes and drives.
- Have employees take their laptops home.
- Shut off utilities such as electricity, natural gas.
- Relocate 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 them. Seal with caulking.
- Even equipment not expected to be exposed directly by floodwater should be covered with plastic sheeting due to condensation inside buildings.
- Keep all property catch basins and roof/floor drains clear before and during flooding.
- Ensure sump pumps are operational.
- Close any manual backflow valves on storm or sewer lines.
- Consider setting up flood pumps prior to the flood event if enough advance warning is provided.

After the flood: Cleanup and recovery

Upon confirmation with local authorities that the threat of flooding has subsided, initiate cleanup and recovery operations.

- If floodwaters are inside the building, perform a high level assessment of whether the water is contaminated with biohazards or hazardous materials and potential physical hazards, including 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.
- If the water is determined to be nonhazardous, remove it from the building. Pumps may be required; consult contractor or agreement with the supplier that will provide them.
- 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, and other debris/contaminants and lubricate. Remove rust proofing compound.
- Remove all accumulated combustible debris before it can dry out.
- Provide dumpsters for debris.
- Obtain additional sump pumps as needed.
- Dehumidify the building as quickly as possible. Large fans may be needed; consult contractor or agreement with supplier that will provide them).
- Confirm the operability of all building systems — including fire detection and fire suppression, elevator, ventilation, air conditioning, and heat — and identify any damaged systems.
- Verify that the affected areas have been restored and are safe to reoccupy by tenants.

Additional considerations

REVIEWING, TRAINING, AND UPDATING THE PLAN

At a minimum, FERPs should be reviewed annually, including:

- Training of all employees identified in the plan.
- “Dry” running of the plan, including participation of all referenced staff, and alternates, and equipment.
- Establishing inventory of all flood protection supplies and equipment. Is it in good condition?
- Ensuring all contracts with emergency response contractors are in place and still valid.
- Reviewing all content and assumptions. For example, has the designated flood zone changed?
- Learning from previous event. For example, record areas that were affected by floods in the past, what worked, and what failed.

HEAVY RAIN EVENTS

While FERPs may not be necessary for all buildings, the following should be considered for all buildings in advance of heavy rain events:

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

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