



From drenched to defense:

A GUIDE TO PROTECTING YOUR PROPERTY FROM FLOOD

Flood stands as the most prevalent natural hazard globally, impacting a larger population and more businesses than any other calamity. The reach of floods extends beyond regions close to major bodies of water like rivers and coastlines, rendering even areas far removed susceptible to devastation. We have all heard the all-too-common phrase, “it’s not if, but when,” a flood will occur, but recently the frequency, severity and reach of floods have proven greater than ever before. Consequently, it is imperative for every business, irrespective of location, to understand and prepare for their exposure to flood.

Understanding your flood exposure is the foundation for mitigating your facilities’ risk. Determining what your location can anticipate during a major flood is not something to consider when a flood is imminent — this should be done months in advance to allow time to prepare. Consider the below points to establish your location vulnerabilities and protection priorities.

Flood source

What are the surrounding bodies of water that pose a threat to your facility (e.g., rivers, streams, lakes, coastal). This could be one or multiple sources.

Evaluate exposure

Identify flood levels projected for all sources and compare to your buildings’ finished floor elevation to understand anticipated depth of water at the facility. This could be using FEMA flood maps, or other data outlying typical flood levels for the 100-year and 500-year flood events.

Critical property

Identify key buildings, below-grade structures, electrical systems, critical equipment, machinery, storage tanks and hazardous materials that need to be protected.

Points of entry

Create an inventory of all entry points. Thorough identification of all entry points is essential to keeping the water out of your facility. This includes personnel doors, garage doors, windows, vents, drains, etc. Neglecting any entry points can result in the failure to keep water out.

TIP | To determine your buildings finish floor elevation, reference building drawings if available, or work with a civil engineering firm to assist.

What are the common types of floods?

There are three main types of floods: fluvial floods, alternatively referred to as river floods; pluvial or flash floods; and coastal floods, frequently termed as storm surges. Each type varies in how they occur, as do the consequences of each flood type, and the measures one should undertake to prevent or mitigate the damage caused by flooding.

01 FLUVIAL FLOOD (RIVER)

Perhaps the most thought of when people think of flood, this type occurs when the water level in a near body of water (e.g. river, lake, stream) rises and overflows. The rise of flood is caused by increased rainfall or snowmelt that then drains into these bodies of water. Insurance carriers use flood maps that consider historic flooding events, ground topography, anticipated flood levels and other factors to determine your location's fluvial flood exposure.

02 PLUVIAL FLOOD (STORM OR SURFACE WATER)

This flood type occurs due to excessive rainfall within a short duration. The accumulated precipitation in a short duration overwhelms storm drains, causing flooding to occur. A pluvial event can take place anywhere. Often cities that seldom get rainfall are heavily affected due to the dry ground not absorbing water quickly and infrastructure not designed for such events (e.g., Las Vegas, Phoenix). To assess the risk, the 24-hour 100-year rainfall is considered along with surrounding topography to determine how much water is expected and where it will flow.

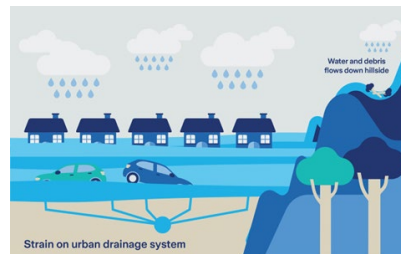
03 COASTAL FLOOD (STORM SURGE)

Often a result of tropical storms and hurricanes, storm surge events take place when water is driven ashore from high winds. The strength and direction of the storm, windspeed, tide and other factors all contribute to the severity of flood. Similarly to other flood types, the topography, history of previous events, and modeling allow for a location's exposure to be assessed.

FLUVIAL FLOOD



PLUVIAL FLOOD



COASTAL FLOOD



Source: Zurich.com

Create your watertight plan

When floods strike, it often causes widespread devastation. Power, facility access, emergency services — all can become unavailable for days or weeks during major events. Fortunately floods often provide notice before they strike. This allows for businesses to enact their Flood Emergency Response Plan (FERP) to significantly reduce the potential physical damage and limit costly business interruption.

An effective FERP starts by understanding your risk and preparing for an event. The below sections provide a brief structure for how to prepare, respond and recover from a flood.

Preparedness measures

PHYSICAL PROTECTION | Implement flood-resistant design measures, such as permanent or temporary barriers, waterproofing, and elevation of property to minimize damage to critical property and infrastructure. High-value property or critical property should be prioritized.

MONITOR FLOOD LEVELS | Identify a means to monitor the flood progression using public gauge data or other means to ensure the FERP can be enacted at the correct time. Larger rivers provide ample notice while smaller streams can flood more quickly. It is important to understand your lead time so that the FERP can be successfully implemented.

EMERGENCY RESPONSE TEAM (ERT) | A FERP is only as good as the people implementing it. Establish an ERT with assigned roles including back-up personnel to implement your plan. This should include a leader for the overall ERT. Training should be provided with drills conducted at least annually to make sure all team members understand their assignments.

CONTRACTOR RELATIONS | Establish a relationship with needed contractors post flood so that you are prioritized. This could include a restoration contractor, temporary equipment contractor, electrical contractor, etc.

During the flood — FERP implementation

INSTALL | Physical barriers are installed, equipment and/or inventory elevated above flood levels. Buildings secured with all points of entry points previously identified sealed.

SHUTDOWN | Safe shutdown of equipment.

MONITOR | Maintain contact with authorities monitoring flood progression.

DOCUMENT | Routinely take photos to document the flood progress on site.

PATROL | Regularly assess the integrity of the physical protection installed. If leaks occur, often a mobile water pump can be used to pump water back to the flood side of the barriers.

Recovering from the flood

ASSESS DAMAGE | Document the flood damage on site and notify necessary personnel including your insurance broker and carrier. Prioritized repairs and contact contractors.

RE-ENERGIZE | Have qualified personnel check all utilities to confirm turning power on is safe.

CLEAN UP | Begin cleanup operations to remove any standing water or debris. Salvage products or equipment that can be cleaned or repaired.

MODIFY FERP | Document actions that could be improved upon to implement in the FERP for future events.

While most carriers evaluate to the 100-year and 500-year flood levels, a site’s exposure can be much more frequent than that. This table below shows the likelihood of a major flood event over a given time horizon.

TABLE 2. PROBABILITY OF FLOODING AT LEAST ONCE DURING FACILITY’S LIFETIME

Exposure level return period	Facility life (years)			
	10	25	50	100
	Flooding probability			
100 years (1% annual exceedance)	10%	22%	39%	63%
500 years (0.2% annual exceedance)	2%	5%	10%	18%

Source: Table 2 FMDS 1-40

Success stories

Oceanfront hospital

A healthcare company has a major hospital located near the Gulf of Mexico. During a hurricane in 2019, the hospital undertook substantial flood damage within low lying areas and costly business interruption due to poor planning. In subsequent years, the hospital developed a robust flood emergency response plan, invested in both permanent and temporary flood barriers and trained personnel on how to respond. In 2021 a similar event took place; however, this time they sustained minimal damage and their planning allowed for them to keep their hospital operational.

Midwest manufacturing

A manufacturing client in Missouri has a location within the 500-year flood zone. Despite the low likelihood of flood within a given year, they decided to invest in a Tiger Dam System to protect their plant. Their investment was quickly realized when two 500-year events struck their facility 18 months apart. The plant sustained business interruption losses due to limited access to the plant during the flood, but sustained no physical damage and was able to resume operations as soon as flood levels receded.

Solutions are out there

As flood exposures have grown in significance in the property insurance space, so has the number of flood prevention solutions on the market. The anticipated flood depth and warning time will largely dictate what physical prevention measures to take. Here are some of the best products and solutions to mitigate your flood exposures.

Protect the perimeter

Use temporary or permanent solutions to protect entire sites, individual buildings, entry points or critical assets. Permanent solutions could include concrete dikes or levees, with temporary solutions including some of the following examples:



AQUAFENCE — FLOODWALL

Can surround buildings facilities, critical assets or multiple blocks, without any contact to the building itself. In most urban environments, the system can be used without any advanced site work.



TIGER DAM SYSTEM

Water-filled bladder technology that contours to ground making it an excellent choice for uneven surfaces.



FLOOD DOOR

Set it and forget it with a flood rated pedestrian door. Withstanding water up to three feet, all you need to do is ensure it is closed.



HYDRODEFENSE FLOOD PLANK

These easy-to-install aluminum planks act as stop logs to protect man doors, garage doors or any other points of entry.

Steps you can take today

Investing in physical flood prevention can take significant capital and time. If a flood is imminent and longer-term or permanent options are not viable, it is important to take measures to protect your facility.

- Relocate critical goods, spare parts, and high-value equipment away from low-lying areas to an area above the expected flood level to protect from damage.
- De-energize equipment that cannot be relocated that is expected to get wet.
- Use temporary barriers at entrances to buildings to reduce the amount of water.
- For storm water flooding: Ensure all drains around the building, as well as those on the roof of the building, are free of debris and vegetation to allow water to flow.

Please contact Lockton to learn more about how your can protect your facilities against flood.



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