Natural Hazards Resilience
Prepare, Respond, Survive, Recover

ZURICH®

Winter Hazard Control Plan

Preparing your business for cold weather conditions

Extreme cold, snow, ice, sleet and freezing rain can all have serious consequences for your employees, your property and your business operations.

As winter approaches, reduce the chance of accidents, injuries and property damage by being prepared with a comprehensive Winter Hazard Control Plan.

Ice, snow, or water accumulated from melting ice and snow, greatly increase the chances of slips and falls for employees and visitors. Winter weather also challenges buildings and other property with exposures to freezing temperatures and accumulations of snow.

To reduce the chance of accidents and property damage, all businesses should have a **Winter Hazard Control Plan** that includes information and preparation checklists to help mitigate any unexpected damage or harm to:

- Buildings
  - Roofs
  - Windows and doors
  - Heating systems
  - Power and electrical systems
- Walking surfaces
- Employees
- Vehicles

The plan should be written down and distributed widely and indicate actions to be taken before the onset of cold weather (pre-winter preparation phase), as well as various evaluations that should be conducted during cold weather (winter actions).

The plan should include checklists or similar documents to capture periodic evaluations, identify needed improvements and verify the actions taken.

Buildings

Failures of roofs, windows, doors, heating, electrical and piping systems (e.g. fire protection, plumbing, water) can expose buildings to freeze damage.

Roofs

The roof cover, flashing, drains and decks form a system that provides a barrier to cold air, a seal against water intrusion and strength to support accumulations of snow and ice. Any weak link in this system of features can expose the interior of the building to serious damage.

Pre-winter preparation phase
Roof collapse is a potential concern during winter storms due to snow accumulation. Rain falling onto a snow-covered roof will not drain readily (frozen rainwater can even result in blockage of the roof drainage system) and can quickly add to the overall roof load.

Before winter, inspect roofing systems and repair or replace deteriorated roof coverings. Verify roof drains are clear of debris and strainer covers are in place. Secure any loose rooftop equipment (e.g. satellite dishes) or flashing.

Have a qualified structural engineer verify snow capacity for all roofs (especially older buildings). Pay special attention to areas where snow can accumulate. For instance, satellite dishes, solar panels and other rooftop equipment can cause concentrated snow loading on a limited area of the roof by sliding and drifting snow. Multi-level roofs can also create snow accumulations.

When building or installing new rooftop equipment, a structural engineer should reevaluate the building to determine if reinforcement is needed to accommodate the new snow load.

Winter actions
The design snow load of a roof may be exceeded during the life of a building, so monitor each significant snow event and be prepared to have snow removed should it threaten to exceed the maximum snow load. Monitoring snow accumulations involves periodic measurement of snow on the roof. Before you do this, develop a roof snow removal 'safe work plan' that includes fall protection means and snow removal tools (plastic snow shovel, plastic sleds, and plastic tubs).

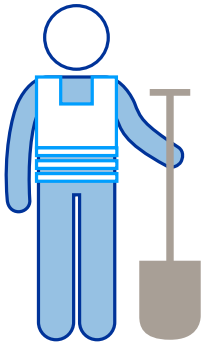
First remove snow from drains. Then remove drifted snow; this snow will generally be at locations with changes in roof configuration/elevation, around rooftop mechanical vents, skylights, parapets and penthouse walls. Finally, remove snow between building column lines. Care must be taken with the removal of snow to prevent damage to the roof membrane. Avoid removal within 50 mm (2 inches) of the surface of the roof membrane. The use of salt on most roofs will likely void the manufacturer's warranty.

Roofs

Pre-winter preparation phase
- Inspect roofing systems and repair or replace deteriorated roof coverings.
- Verify roof drains are clear of debris.
- Secure loose rooftop equipment.
- Have a qualified structural engineer verify snow capacity for all roofs.
- Establish snow-removal contracts.

Winter actions
During cold weather, periodically verify:
- Roof drains are clear (including both drain inlets and outlets).
- Roof perimeter flashing is intact.

During winter storms: Monitor snow accumulations and be prepared to remove snow.



Snow removal contractors

When selecting a contractor for snow removal, review the contract to verify adequate levels of insurance. Obtain certificates of insurance for workers' compensation and general liability. Ensure there is coverage for property damage or bodily injuries caused by contractor employees or their operations.

All contracts for snow removal should specify under what conditions – or depth – snow removal begins.

Make sure you have a backup plan in case your contractor does not show up. Some contractors perform snow/ice removal as a secondary business during their off-season (e.g. landscapers) or are simply owners of four-wheel drive vehicles who attach a snowplow. Be sure to select contractors with the appropriate experience and insurance for the service required.

Windows and doors

Windows and doors can be a source of cold air entry into your building.

Pre-winter preparation phase
Replace cracked or missing glass; and repair or replace damaged exterior doors, door closers, door frames, door gaskets and truck dock door seals. Use of double-glazing is highly recommended, also as an energy-saving measure.

Winter actions
Windows are subject to breakage due to thermal stress, accidental damage or intentional vandalism. To allow prompt detection of broken glass, windows should be inspected during cold weather so that prompt repairs can be made. Damaged glass can quickly lead to a localized loss of building heat that can in turn lead to freeze damage to sprinklers, domestic water and process water systems.

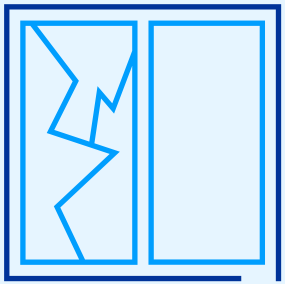
Doors are another source of localized building heat loss that can quickly lead to freeze damage. Personnel doors should normally be kept closed and periodically inspected to verify door seals remain in good condition. Overhead loading-dock doors should be kept closed whenever trucks are not actively loading. Dock-door seals, which close the space between trailers and the overhead door frame, should be maintained in good condition.

Windows and doors

Pre-winter preparation phase
- Replace cracked or missing glass.
- Repair or replace damaged exterior doors.
- Double-glazing is highly recommended.

Winter actions
During cold weather, periodically verify:
- Window glass is intact.
- Doors and windows are closed.
- Doors and windows have a good weather seal.

During winter storms: Verify doors and windows are closed



Heating systems

Heat is essential to protect water-based systems such as fire protection, domestic water and process water from freezing during cold weather.

Pre-winter preparation phase
All heating systems should be checked annually before the start of winter by a qualified professional. During cold weather, prioritize heat/fuel supplies for critical equipment and utilities. Install or inspect monitoring systems that verify heating systems are working and the correct temperature is maintained.

Maintain an adequate supply of heating fuel onsite just prior to and during the cold weather season as demand for fuel may limit available supplies and snow and ice may delay fuel deliveries. Do not forget that backup fuel systems also need to be maintained. Make sure that you store fuel in designated areas away from sources of ignition.

Winter actions
Unoccupied buildings should have temperature monitoring systems to promptly detect and report temperature loss. As an option, personnel should periodically visit unoccupied buildings, especially during extreme cold weather occurring over weekends or holidays.

During periods of extreme cold weather, heat should not be turned off or reduced excessively during unoccupied hours.

As well as maintaining heat, ensure you maintain the distribution of adequate heat to all building areas that house systems subject to freezing. These systems may include fire sprinklers, domestic hot and cold water, steam condensate return lines, process water lines and other similar systems.

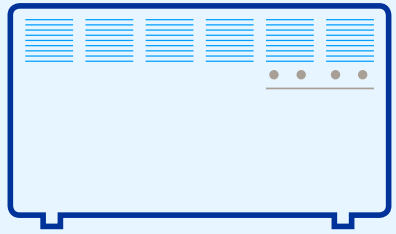
Heating systems

Pre-winter preparation phase
- Service all heating systems.

Winter actions
During cold weather, periodically verify:

- Adequate heat is maintained in all areas at all times.
- All critical areas are monitored electronically or with human presence.
- An adequate supply of fuel is maintained.

During winter storms: do not turn off or reduce heat from normal levels.



Power and electrical systems

Electric power is essential to maintaining heat and other services needed to protect the building and operations from the adverse effects of cold weather. Appropriate measures should be implemented to maintain normal and emergency sources of electric power.

Pre-winter preparation phase

If you have an emergency generator, verify that it is operating properly and that there is adequate fuel available for the expected duration of the event (based on historical events in the region) in case of a power outage.

All emergency lighting should be checked to make sure it is in operating condition. Inspect onsite electrical supply lines to make sure that they are free from obstacles, such as tree limbs, that could cause an outage in a storm. Having qualified personnel maintain onsite vegetation and foliage on site.

Review emergency equipment shutdown and lock-out/tag-out procedures in case repairs become necessary. All of your computer data should be backed up and stored offsite in case you cannot access your facility for several days.

Winter actions

Power is required to maintain heating that is essential to protect water-based systems such as fire protection, domestic water and process water from freeze damage. Do not turn off or reduce heat from normal levels to save power.

Electrical systems

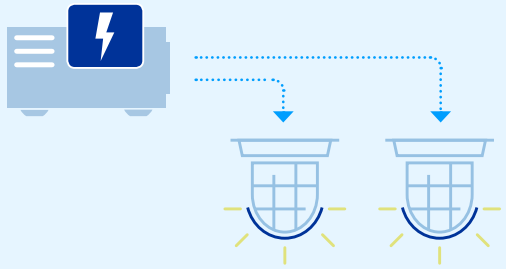
Pre-winter preparation phase

- Review lock-out/tag-out procedures if service or repair become necessary.
- Service emergency generators, emergency lighting and electrical circuits.
- Maintain foliage on site.

Winter actions

- Periodically backup computer data.
- Maintain adequate supply of fuel.

During winter storms: do not turn off or reduce heat from normal levels to save power.



Walking surfaces

The potential for slip and fall accidents increases during winter months. While you cannot completely eliminate snow and ice, there are things that you can do to reduce slip and fall exposures.

Pre-winter preparation phase
Check all snow removal equipment to verify it is in good operating order. Purchase entry walk-off mats and extend mats 2.5-3.5 meters (8-12 ft) into the entrance to allow removal of moisture from shoes. Verify all outside lighting is in full operating condition.

Maintain and repair drainage systems. If water does not drain properly then ice can accumulate. Fill potholes and repair pavements as cracks, holes and uneven surfaces may not be visible due to snow cover.

Winter actions
Clear pavements, driveways, garages and car parks from ice and snow. One ice/snow removal effort may not be sufficient. Predetermine when snow/ice removal occurs and who is responsible for the job. Establish triggers for clearing duties and ensure snow removal equipment is operated by trained personnel only.

Continually monitor paths and roads and use salt or other ice-melting products; paying attention to steps, ramps and the areas around steps. Monitor floors at doors to see if dry mopping is needed. Post wet floor signs to alert people of wet floor surfaces.

Lighting in parking areas is very important during winter months. All lights should be checked at the start and throughout the cold weather season to ensure parking areas are adequately lit.

The risk from slips, trips and falls does not end when the storm is over, but extends to warming conditions. Most people are more cautious while walking during winter storms but the daily thaw and night freeze cycles bring more slick surfaces. The walking surfaces that you have treated with salt or sand will probably need to be treated again.

Walking surfaces

Pre-winter preparation phase

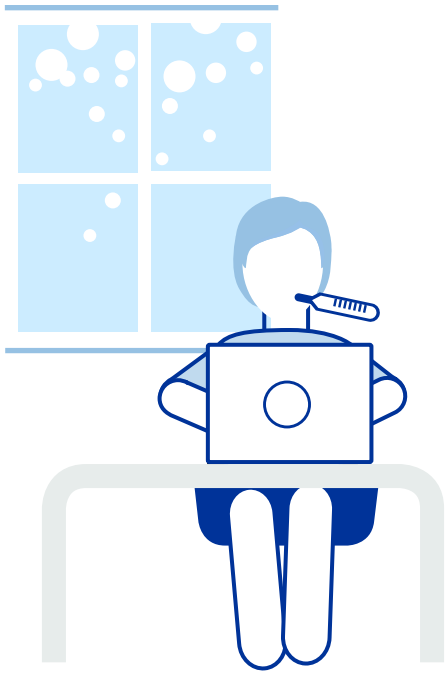
- Ensure snow removal equipment is in good operating order.
- Buy entry walk-off mats that extend into the entrance to remove moisture from shoes.
- Verify all outside lighting is in full operating condition.
- Predetermine who is responsible for clearing ice and snow.
- Maintain and repair drainage systems.
- Fill potholes and repair pavements.

Winter actions

- Clear pavements, driveways, garages and car parks from ice and snow.
- Monitor paths and roads and use salt or other ice-melting products.
- Monitor floors at doors to see if dry mopping is needed.
- Ensure parking areas are adequately lit.

Employees

It is important to prepare your employees for the rigors of winter weather.



Pre-winter preparation phase
Review local meteorological service alert terminology with employees. For example, in some regions a 'watch' indicates that conditions are favorable for winter weather. 'Warnings' indicate that the event is happening within an hour of your location. Define and inform employees of corresponding actions for each warning level.

Establish a communication/notification protocol ('telephone tree') in the event it becomes necessary to close your facility. Verify that the information is correct on the protocol directory ('tree') before the start of the winter season.

Another option is toll-free number or other centralized phone number for your employees to access the latest information on location closings. Employees should be given cards to carry with this phone number on it. This number could also serve as an excellent notification tool for other emergencies.

Establish a workplace social media link and toll-free number to receive and send notifications, or use social media links to contact fellow employees when applicable.

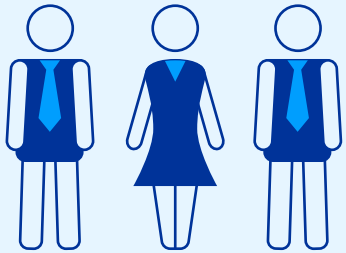
If you have employees who must work outside, provide training to ensure they understand the signs of hypothermia and frostbite. Frostbite is a loss of feeling in hands and feet as well as ears and nose and can cause permanent harm to people. Hypothermia occurs when the body temperature drops below 35°C (95°F). Symptoms include shivering, memory lapse, stumbling, slow speech, drowsiness and exhaustion.

With cold winter weather comes the flu season. You should educate your employees and encourage them to stay home when they are sick to prevent spreading illness. Monitor the World Health Organization or your local health agencies to determine alerts that may affect your employees and review your business continuity plans.

Employees

Pre-winter preparation phase

- Review local meteorological service alert terminology with employees.
- Set up a notification system to ensure employees are aware of facility closures.
- Train employees who work outdoors to recognize the signs and symptoms of cold weather exposure.
- Educate employees to stay home when sick.



Vehicles

Vehicles undergo a lot of stress during cold, winter weather.

Pre-winter preparation phase
Prepare vehicles for winter conditions. You should check windshield wipers, antifreeze and oil levels, and if necessary replace oil with winter-grade oil. Do not forget to check tires for adequate tread and air pressure. Winter tires should be mounted at the start of the winter season.

Before the start of the season, you should review winter driving safety with employees and remind them of winter driving techniques. It may be advisable to provide specialist (3rd party) courses.

Winter actions
Employees should be reminded that fuel tanks should be no less than half-full to prevent condensation build-up in the fuel tank, which can cause gas lines to freeze. Having the extra fuel can also be very important if the driver is stranded in traffic or extreme weather circumstances.

Emergency items should be kept in each vehicle, including rain gear and extra clothing (including mittens, gloves, hats and socks), a fully charged cellphone, flashlights with extra batteries, a small sack of sand (for traction), a snow shovel, a brightly colored cloth to use as a flag (if needed), bottled water and non-perishable food such as a box of crackers.

Make sure employees plan their routes and let you know the route before departing on company business.

Vehicles

Pre-winter preparation phase

- Prepare vehicles for winter conditions.
- Review winter driving safety with employees or provide specialist (3rd party) winter driving courses.

Winter actions

- Have employees maintain fuel levels above a half-tank.
- Verify emergency supplies are provided in each vehicle.
- Ensure employees plan and inform business of routes before departure.
- Maintain adequate supply of fuel.

Pre-winter preparation checklist

During the pre-winter plan review, take time to review all business continuity plans to make sure they are up to date and ready for use in the event of any emergency, including a winter storm.

TASK	ASSIGNED TO	DATE ASSIGNED	DATE COMPLETED
Roofs			
Inspect roofing systems and repair or replace deteriorated roof coverings			
Verify roof drains are clear and strainer covers are in place			
Secure any loose rooftop equipment or flashing			
Verify or determine design snow loads for all roofs			
Develop a roof snow removal 'safe work plan' and establish roof snow removal contracts			
Windows and doors			
Replace cracked or missing glass			
Repair or replace exterior doors, door closers, door frames, door gaskets and truck dock door seals			
Heating systems			
Service all heating systems			
Install or inspect monitoring systems that verify heating systems are working and the correct temperature is maintained			
Maintain an adequate supply of heating fuel stored in designated areas away from sources of ignition			

TASK	ASSIGNED TO	DATE ASSIGNED	DATE COMPLETED
Power and electrical systems			
Service emergency generators			
Ensure there is adequate fuel available for generator			
Review lock-out/tag-out procedures should service or repair become necessary			
Service emergency lighting			
Inspect onsite electrical supply lines to make sure that they are free from obstacles, such as tree limbs, that could cause an outage in a storm			
Maintain onsite vegetation and foliage that could damage power lines during a storm			
Fire protection systems			
Ensure all dry sprinkler system pipes are pitched to low point drains			
Ensure each dry sprinkler system has a reliable source of air			
Ensure the presence of adequate specific gravity for antifreeze fire sprinkler systems			
Ensure all dry-barrel fire hydrants are drained			
Ensure all fire department connections are equipped with automatic drains			
Ensure all fire pump test headers are drained			

TASK	ASSIGNED TO	DATE ASSIGNED	DATE COMPLETED
Walking surfaces			
Verify snow removal equipment is in good operating order			
Buy entry walk-off mats that extend into the entrance to remove moisture from shoes			
Verify all outside lighting is in full operating condition			
Predetermine who is responsible for clearing ice and snow			
Repair drainage systems			
Fill potholes and repair pavements			
Employees			
Review local meteorological service alert terminology with employees			
Set up a notification system to ensure employees are aware of facility closures			
Train employees who work outdoors to recognize the signs and symptoms of cold weather exposure			
Educate employees to stay home when sick			

TASK	ASSIGNED TO	DATE ASSIGNED	DATE COMPLETED
Contractors			
Review contracts for snow removal for adequate levels of insurance workers' compensation and general liability, property damage and bodily injuries			
Verify contracts for snow removal are specify under what conditions – or depth – snow removal begins			
Check experience and references of contractors			
Vehicles			
Prepare vehicles for winter conditions			
Review winter driving safety with employees or provide specialist (3rd party) winter driving courses.			
Verify emergency supplies are provided in each vehicle.			

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