Risk Control

# Hailstorms: Protecting People and Property

Hail is a naturally occurring weather phenomenon formed when precipitation within thunderstorms freezes in the cold regions of the atmosphere. When the weight of the hail exceeds the ability of the updrafts to keep it aloft, hail falls to the ground. Depending on meteorological conditions, the size of hailstones can vary widely, from pea size (.25") to grapefruit size (4.5") and even larger.

## Where are hailstorms most likely to occur?

While severe hail can occur anywhere in Canada, they are most frequent in Alberta, the southern Prairies and southwestern Ontario. The frequency of convective storm activity (i.e., thunderstorms) is a major driver of hail frequency, as well as certain seasonal atmospheric conditions that are conducive to hail formation at lower altitudes, which increases the likelihood of hail striking the ground.

## When do hailstorms occur?

Damaging hailstorms can occur during any month but are historically most frequent between May to October with parts of the Prairies experiencing up to 10 hailstorms a year. Multiple hailstorms can occur during one severe weather event, and the total duration can be anywhere from a few seconds to 20 minutes or more. In long-duration hailstorms, hail can accumulate to depths of several inches, similar to snowfall.

## What are the risks associated with hailstorms?

**Property Damage.** Hailstorms result in billions of dollars of property damage in North America each year. Hail strikes can damage buildings, equipment, outdoor storage and vehicles. A 2020 hailstorm in Calgary became the most expensive in Canada, totaling $1.3 billion. Beyond the physical impact damage, an often unanticipated consequence of hail strikes is subsequent water damage. Since hail occurs during thunderstorms when heavy rain is likely, roofs or skylights damaged by hail impacts will often allow water infiltration into the roof assembly or the building itself, damaging interior contents. Water damage can also occur when hail obstructs drains, scuppers or gutters, particularly during long-duration hail events.

**Employee and Visitor Injury.** While often overlooked, hailstorms can pose potential health and safety hazards, including serious injuries.

## Protecting Property

There are several steps you can take to reduce the risk to your building(s) and other property at your facility:

**Inspect and maintain roofing systems and proactively replace older roofs with hail-resistant roof assemblies**. When it comes to buildings, roofs typically absorb the most damage in hailstorms. As a roof ages, normal weathering of the materials reduces the ability of the roofing assembly to resist impact damage like hail strikes.

Roofs with existing visible damage such as alligatoring, blisters and other signs of deterioration are even more vulnerable to damage from hail. While there is significant variation in roof lifespan due to UV exposure and other factors, a 15-year lifespan is a good rule of thumb for single- and multi-ply roofs when considering capital planning for replacements. Roof warranties typically do not cover hail damage.

Normal preventative maintenance should include semi-annual roof inspections by a qualified party. If problems are found during inspections, a Registered Roof Consultant (RRC) can provide an independent assessment of the roof's condition and oversight during any major roofing project to ensure the roofing assembly is installed as specified. If planning to replace a roof at your facility, consult a CNA Risk Control professional for further guidance on how to improve roof hail resiliency.

**Inspect and protect key equipment.** Heating and cooling (HVAC) systems, refrigeration equipment, dust collectors and photovoltaic (PV) panels are examples of outdoor equipment vulnerable to hail damage.

When inspecting and servicing HVAC equipment in accordance with manufacturer's guidance, check for any hail damage or deformation on condenser coils, which can reduce the efficiency of the unit. These surfaces can be protected by manufacturer-provided guards (preferred) or site-fabricated guards utilizing at least No. 11 gauge steel wire mesh with openings small enough (<1 inch) to keep hail out. When adding hail guards, always ensure airflow is sufficient for proper operation after the guards are installed. If your building is within a hail-prone area, PV panels should also have hail-impact resistance suitable for the geography. A CNA Risk Control professional can provide a personalized risk assessment of your exterior equipment and further guidance on how best to protect it from hail damage.

**Inspect and protect skylights.** When it comes to compromising roof assemblies in a hailstorm, skylights are the "weakest link" because damage will allow an immediate path for water to enter the structure. When inspecting the roof, check for skylights that show signs of cracks (embrittlement) or discoloration due to weathering; these skylights are particularly vulnerable to hail damage. In hail-prone areas, install listed or approved skylights that are resistant to hail impacts and guards to reduce the risk of failure during a hail event. A CNA Risk Control professional can provide further guidance on how best to protect these rooftop openings.

**Don't forget outside storage and vehicles.** If company vehicles are stored outside in parking areas, can they quickly be moved to shelter in the event of severe weather? Unprotected outside storage of raw materials or finished goods in high-hazard hail areas should be avoided, unless materials are unlikely to be damaged by hail.

## Protecting People

Here are some tips for keeping employees and visitors safe during hail season:

**Review incident response plans.** Ensure that your Incident Response plan (sometimes referred to as Emergency Response) contemplates hail and other severe weather events applicable to your location(s). If employees are working outdoors or visitors are congregating in exposed areas, make sure to include procedures for prompt notification and evacuation to designated shelters or protected areas.

## Weather Advisories

As the authoritative source of 24/7 weather alerts across Canada, Environment Canada provides prompt notification of weather emergencies that can threaten your facility, including hail events.

**Take post-storm safety precautions.** Roofs, building exteriors and outside equipment should be inspected following hail events to check for damage. If a hailstorm impacts your facility, do not allow employees to go outside until all storms have passed. It is not unusual for hail events to "stop and restart" when a series of storms is moving through an area.

Use caution when inspecting exterior surfaces, especially roofs. Significant water accumulations or melting hail may create slip-and-fall hazards on walking surfaces and ladders. At a minimum, remember to adhere to the fall protection and elevated walk-working surface requirements of the Canadian Centre for Occupational Health and Safety (CCOHS).

To learn more about managing your risk and increasing efficiency, visit cnacanada.ca.