

Hailstorms are among the costliest natural hazards in Canada, causing significant annual losses for both commercial and residential property owners. While hail can affect communities across the country, Western Canada, particularly Alberta, experiences some of the most intense and frequent hail events. For example, Calgary, located within the area often referred to as “Hailstorm Alley,” has a long history of hail-related losses. In 2024, the city was struck by a major hailstorm that produced hailstones larger than golf balls, resulting in [approximately \\$3.25 billion in insured damages](#). Events like this highlight the growing impact of hailstorms, particularly as urban development expands, and climate change contributes to more severe weather patterns.

Understanding hail risks and taking proactive steps can help property owners reduce damage, control costs, and recover more quickly. This guide provides practical strategies for strengthening buildings against hail, preparing for storms, and managing recovery efforts to minimize losses.

## Hail Facts

### Hail formation

Hail develops inside the core of strong thunderstorms. Warm, rapidly rising air currents, known as convection currents, lift water vapour high into the atmosphere. At higher, cooler altitudes, the vapour condenses into water droplets. If temperatures are cold enough, ice crystals form around tiny particles such as dust or dirt carried upward from the ground.

### Hail growth

As the ice crystals circulate within the storm, additional layers of water freeze onto their surfaces. Updrafts inside the storm continue to lift the growing hailstones higher into the cloud. The more time they spend aloft, the larger they can become. Eventually, when the hailstones become too heavy for the updrafts to support, they fall toward the ground, often collecting even more moisture and enlarging as they descend.

### Hail characteristics

Hailstones must have a minimum diameter of 0.5 centimetres to be classified as hail, while anything smaller is considered snow or ice pellets. In severe storms, hailstones can exceed 10 centimetres in diameter, about the size of a grapefruit. Falling hailstones can reach speeds of up to 130 kilometres per hour, making them extremely hazardous.

## Damage Prevention Strategies

### Fortify the building envelope

As the physical barrier between a building’s interior and the elements, the envelope should be reinforced as the first line of defence against hailstorms. Strategies to help prevent damage to buildings include, but are not limited to:

- ☐ Utilize Class 4 impact-resistant roofing materials that comply with *Underwriters Laboratories (UL) 2218 – Standard for Impact Resistance of Prepared Roof Covering Materials*. Options like impact-resistant asphalt shingles, standing seam metal roofing, or synthetic slate products that adhere to this standard offer enhanced protection against hail damage.
- ☐ When selecting exterior siding materials, prioritize those that offer hail resistance, such as brick/masonry veneers, fiber cement board (Hardie board), engineered wood, or heavy-gauge metal. Should vinyl siding be considered, select products that comply with *ASTM D3679 – Standard Specification for Rigid Poly Vinyl Chloride (PVC) Siding*.

- ☐ Install glass windows, skylights, and/or add storm shutters rated to withstand impact debris as defined by the *American Society for Testing and Materials (ASTM) E1996 – Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris standards*.
- ☐ In addition to meeting the previously referenced ASTM E1996 standard, any skylights should be rated to meet the requirements of *ASTM E1886 – Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials*.

## **Safeguard outdoor equipment**

Protecting outdoor equipment is essential to prevent costly damage and avoid debris-related hazards during a hailstorm. Strategies to safeguard outdoor equipment include, but are not limited to:

- ☐ Ensure mechanical systems (e.g., HVAC units, etc.) are built with hail guards. These guards should be approved by equipment manufacturers, ensuring they do not interfere with the equipment's operation.
- ☐ If considering solar panel system installation, select solar panels tested under International Electrotechnical Commission (IEC) 61215 – Standard for Crystalline Silicon Terrestrial Photovoltaic Modules, which includes hail impact testing protocols.
- ☐ Reinforce outdoor sheds and containers with impact-resistant materials and securely anchor them to the ground to reduce the risk of damage or displacement during hailstorms.

## **Review insurance coverage**

Business owners should work with their Broker to review their insurance coverage annually, or more frequently as needed, to ensure they're adequately protected against potential hail damage and can recover quickly after a storm. When working with their Broker, business owners should:

- ☐ Verify that property insurance policies explicitly include coverage for hail damage affecting roofs, windows, skylights, siding, and vehicles.
- ☐ Confirm how hail-specific deductibles are structured within insurance policies, as they may differ from deductibles that cover all perils.
- ☐ Verify that their commercial coverage for business interruption encompasses operational downtime that occurs because of physical damage from a hailstorm.

## **Actions to Take Ahead of Imminent Hailstorm**

When a hailstorm is forecasted to occur, the following actions should be taken to help reduce damage to business property and ensure the safety of staff and customers:

### **Protect vehicles and outdoor equipment**

- ☐ Move all personal, commercial, and fleet vehicles into garages, carports, or covered parking areas to protect them from costly damage to glass and bodywork caused by hail.
- ☐ If vehicle relocation is not possible, consider utilizing portable hail protection systems such as inflatable hail covers or hail nets.
- ☐ Use industrial-grade, hail-resistant tarps or protective covers on outdoor machinery, HVAC units, and other critical assets when relocation is not possible.

## Prepare the premises

- ☐ Make sure that all windows, skylights, doors, and roof hatches are securely fastened and locked to prevent hail from entering the building and to minimize damage caused by wind-driven water.
- ☐ Ensure that all loose outdoor furniture, signage, retail displays, and lightweight structures are brought indoors to avoid potential damage or hazards from debris during the storm.
- ☐ Confirm that backup generators, uninterruptible power supplies (UPS), and emergency lighting systems are operational in the event of power disruption.

## Prioritize safety and communication

- ☐ Instruct employees, residents, and building occupants to seek refuge in secure, interior spaces that are distanced from windows and skylights.
- ☐ Utilize mobile applications and services from Environment and Climate Change Canada (ECCC) to access real-time weather information and emergency alerts.
- ☐ Ensure that readily available kits are well-stocked with items such as flashlights, portable batteries, bottled water, non-perishable food, first aid supplies, and current emergency contact information.

## Recovery Tasks Following a Hailstorm

Returning to a business location after a hailstorm can be an overwhelming experience. Strategies to navigate the immediate situation safely and effectively include, but are not limited to:

### Assess the damages

- ☐ Thoroughly examine roofs, siding, windows, skylights, doors, and HVAC systems for any signs of dents, punctures, cracks, or structural damage.
- ☐ Document any windshield cracks, body panel dents, mechanical issues, or signs of water ingress in commercial or personal vehicles.
- ☐ Capture detailed photographs and videos with timestamps of all damages to support insurance claims and contractor assessments.

### Minimize additional losses

- ☐ Utilize waterproof tarps, sheets of plywood, or durable plastic to effectively cover and seal any damaged roofs, windows, or structural gaps temporarily.
- ☐ Protect salvageable equipment, electronics, and inventory by relocating them from vulnerable areas to dry, secure locations.
- ☐ Maintain a record of receipts and documents for any emergency purchases and repairs to support your insurance claims.

## Initiate insurance claim

- ☐ Contact your insurance Broker or insurer immediately after the storm to report damages and initiate the claims process.
- ☐ Hire licensed and reputable contractors experienced with hail damage to perform detailed assessments and conduct the necessary repairs.
- ☐ Organize long-term repair initiatives and, whenever possible, opt for hail-resistant construction materials that adhere to recognized standards for rebuilding, thereby improving hail resilience for the future.

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