SUMAssure

RISK MANAGEMENT BULLETIN

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Roof Collapse and Ice Damming: A Public Safety Hazard

Snow is a fact of life in Saskatchewan but that doesn't mean we should just leave it where it falls. Built-up or deep snow, particularly when combined with rain, can overload roof structures, increasing the risk of collapse that may endanger public safety and cause property damage.

Snow accumulation can also result in ice damming. Ice damming is when rising heat melts snow and ice, then refreezes at the roofline causing an ice dam. The ice dam prevents water from draining and cause leaks and water damage to the interior.

To the best of our knowledge, Canadian Building Codes provide suitable structural strength for snow, ice, and rain loading on buildings. However, building codes are only as good as the engineering and workmanship at the time of construction and cannot predict additional loading of the structure by occupant use or poor maintenance – not to mention wear and tear that happens to a building over time.

Watch for these risk factors that can lead to building collapses

- Snow, ice, and rain accumulations are higher than those anticipated by the codes (AKA freak snow or rain storms).
- Drifting snow in isolated areas such as roof elevation changes or near large equipment which creates localized loads.
- Poor workmanship and materials in the construction.
- Inadequate engineering design.
- Additional loading on the structure by the occupant (for example, hanging heavy loads such as storage from the building joists or beams).
- Roof elevation differences, especially where the lower roof is older than the higher roof.

Check your roof drains

- Are they blocked with debris?
- Are the filter caps in place to prevent debris from accumulating in the drain pipe? Take immediate action to rectify any problems.

Check the interior structural elements (beams, joists, columns)

- Is there any evidence of corrosion, cracking, or damage?
- Are there any temporary loads suspended from these elements, such as large amounts of hanging clothes, racks, or shelving?
- Promptly involve facilities engineering and professional engineers to review any perceived problems with the structure and remove any loads which would not have been anticipated in the original design.
- If collapse appears imminent, vacate the building and contact the utilities or contractors to shut down gas, water, electricity, and sprinkler systems if it is safe to do.

Watch for these risk factors that can lead to ice dams

- Heavy snow on roof
- Temperature is below freezing
- Icicles are hanging from the eves-troughs

Signs of potential damage

- Shingles dislodge and gutters are sagging
- Water stains on the ceiling and walls
- Damp insulation and smell of mold or mildew
- Signs of structural decay

Snow Removal Plan

We recommend using qualified snow-removal contractors who have adequate liability insurance coverage in place. This should be established ahead of time. If you plan to do this with employees, develop a detailed plan for removal. Employees should be fully trained, and the necessary tools should be on hand to accomplish this.

Key elements of a safe snow removal plan

- Avoid producing uneven or concentrated loading on the roof.
- Secure areas onto which snow will be dumped from a roof to prevent access and potential injury.
- Snow removal should use tools and procedures that will not damage the roof cover, flashing, skylights, etc.
- Workers on a roof must use fall-arrest or travel-restraint equipment in accordance with the fall protection requirements of the Occupational Health and Safety legislation. This ensures workers are protected from falling when undertaking such work. This may be accomplished by using guardrails and barricades, or other effective measures.
- Appropriate fall protection is required for work on all types of roofs, including flat roof structures.

A civil or structural engineer should be consulted to:

- Determine whether snow loads are excessive;
- Determine whether there are signs of structural distress;
- Obtain a removal procedure that will not cause more structural problems; and/or
- Reinforce a structure that is over-stressed.

During the winter months

- Periodically check the roof for snow accumulation. Take note of drifting snow near roof elevation differences, signs, facades, and large equipment. Watch for areas of unusual ice accumulation. Keep a record of these conditions and report them to the facilities engineering.
- Continue to check roof drains even if there is no snow on the roofs and rectify any problems.
- Look for roof leaks and take temporary corrective action, as necessary. Document the locations of leaks and report them to facilities engineering.

If you have questions or need help with this or other risk-mitigation strategies, please contact your SUMAssure representative.

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