Risk Control Best Practices: Roof Snow Loading

This guide provides best practices for evaluating exposure to roof collapse due to snow loading.

The Importance of a Roof Survey

A roof survey is crucial in preventing roof collapse from snow load. Do it well in advance of winter to allow time for repairs. Prioritize and address any issues found, but note that some factors, such as roof design, may be impossible to change. In such cases, take alternative maintenance and storm-monitoring precautions.

Roof Evaluation Key Points

1. Roof Construction Design

- Flat roofs on garages, theaters, auditoriums, gymnasiums, bowling alleys, supermarkets, and warehouses.
- Roofs with a saw-tooth, barrel, or similar designs that can trap snow in low points.
- Roofs with slopes less than 30 degrees or a rise of 4 inches per foot, reducing snow slide-off ability.
- Multilevel roofs allow snow accumulation at intersections of high and low levels.
- Curved roofs that may accumulate snow on the leeward side of the eaves.
- Roofs of metal deck construction with unprotected bar joist supports can fail suddenly and completely.
- Pre-engineered buildings with standing-seam roofs that are less stable under snow loading. Using stiffeners or braces may prevent purlins from rolling over due to the lack of bracing clips.

2. Snow Drifting and Insulation Considerations

- Snow drifts can cause roof collapse by creating load imbalances, even on roofs that can support uniform snow blankets.
- Determine areas that collect drifting snow and prevailing wind directions.
- Over-insulated roof areas trap heat and slow the melting of snow accumulation.

3. Condition and Maintenance Tips

- Hire a civil engineer to determine safe snow load capacity and when snow removal is necessary.
- Install adequate drainage for roofs with poor or no drainage.
- Inspect and clean drains and scuppers at least every three months and after storms.
- Evaluate and reinforce supporting roof framing and columns for new roof-mounted equipment that adds a permanent load.
- Use infrared thermography to detect evidence of past or present leaks, which can lead to water damage and roof collapse.
- Look for metal support ripples or bends, wood member cracks, and roof deformations.
- Watch for ponding, which can cause roof sag and collapse, especially in valley or depressed roof areas.
- Moisture, heat, and humidity can weaken wood bowstring trusses near eave lines.
- Shaded roof areas can result in heavier snow loads due to snow turning into ice.
- Previous collapses indicate a weakness in the roof's design or condition.

Be Prepared in Case of Heavy Snowfall

If the National Weather Service predicts six or more inches of snow in four hours or a total accumulation exceeding 6 inches, be prepared to implement your severe weather plan.

- Determine safe maximum snow depth and clear when half reached.
- Have certificates for contractors, hire vetted roofing contractors/temporary staff, or arrange services of a snow removal contractor.
- Create a roof plot plan with photographs.
- Maintain & cycle the heating system for repair.

Important Equipment to Have on Hand

Snow Removal Equipment

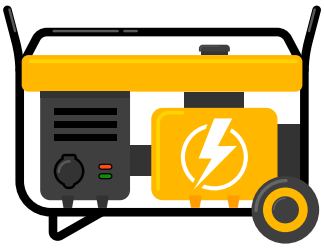
Snow Shovel

Tarps

Wheelbarrow

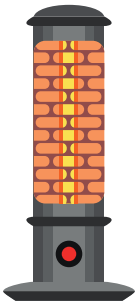
Heat Tape

Other Equipment and Supplies



Emergency Power

Fuel



Additional Portable Heat Devices

Roof Safe De-Icer

During and After a Snowstorm

- Monitor NWS storm warnings.
- Monitor roof conditions for overstressing, keep the site accessible and monitor communication.

Snow Removal Practices

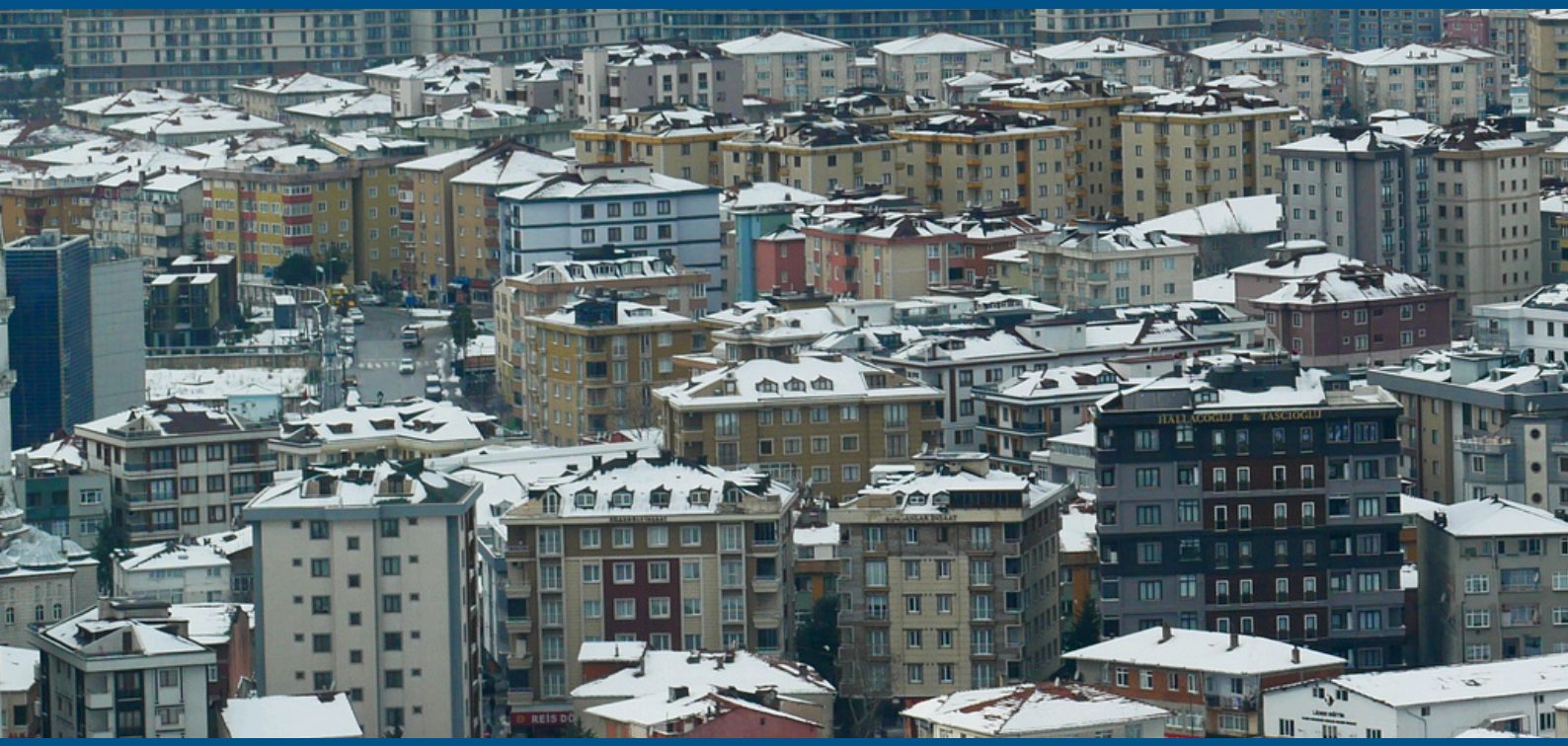
- Ensure knowledgeable and experienced staff perform snow removal.
- Clear snow before the remaining capacity accommodates personnel and equipment.
- Determine safe maximum snow depth and clear when half reached.
- Prioritize areas to be cleared.
- Avoid damaging roof membranes.
- Adjust snowblowers and use plastic shovels and tarps.

Other Actions During Snowstorm

- Inspect and clear exterior roof drains.
- Monitor roof conditions for drifting and freezing rain.

In Case of Impending Roof Collapse

- Evacuate the building and contact your claims adjuster.
- Call utilities and contractors for evaluation and shut off damaged systems.
- Secure damaged areas and close/building openings.



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