

Weather Related Hazards: Determining When to Shovel Your Roof

January 2010

For additional information, please contact Vince Politte 402.964.5582 or vpolitte@ssgi.com

Warmer spring temperatures bring wetter and heavier snow. Some of our heaviest snowfalls will come in March and even April. Heavy snowfall, ice buildup and thaw/freeze cycles increase risk of roof collapse and property damage from falling ice and slip-and-fall incidents. Knowing when and how to shovel your roof can be an important step in avoiding property damage and personal injury.

Snow/Ice Build-Up on Roofs

Heavy snow loads or freezing rain build-ups on roofs can put high stress on the roof structures and may result in a roof collapse.

- Initiate a roof inspection and maintenance program for snow/ice removal. Inspect snow/ice build-ups after heavy snow/ice or a series of smaller storms. If you are not sure whether or not to shovel your roof, below is a quick rule of thumb to help determine if you need to be concerned:

Basic calculation (for a quick analysis only) - This calculation uses a 25% moisture density, which may be conservative for our current snow fall. As a rule of thumb, saturated snow weighs about **20 lbs.** per cubic ft. The moisture content of snow can range from about 1% to about 33% so snow can weigh from about 1 lb. per cubic ft. to over 21 lbs. per cubic ft.

$$(S)(1.25) = P$$

S = Inches of snow on the roof

1.25 = Weight of 1 sq. ft. of snow for each 1" of depth

P = Pounds per square ft.

Example:

If my roof has 20" of snow, what would that equate to?

$$(S)(1.25) = P$$

$$(20")(1.25 \text{ lbs./sq. ft.}) = \mathbf{25 \text{ lbs./sq. ft.}}$$

Any ice build-up on the roof needs to be added to this formula; use 5.2 lbs. for every inch in thickness. In this example, the roof would be okay.

You can always check your roof snow load yourself by weighing a 1 ft. (12") x 1 ft. (12") square of snow cut from your roof, to determine if your snow load is getting close to your roof's designed snow load of 40 lbs. per square ft. This would include any ice build-up on the roof.

This material is intended for informational purposes only and should not be construed as legal advice and is not intended to replace the advice of a qualified attorney, tax advisor or plan provider. This information has been taken from sources which we believe to be reliable, but there is no guarantee as to its accuracy. The information provided herein is intended solely for SilverStone Group clients. You may not display, reproduce, copy, modify, license, sell or disseminate in any manner any information included in this special bulletin.

- Keep roof drains clear of ice and snow. Approved heating cables can be used to ensure that drain downspouts remain clear of ice.
- Remove ice build-up from along the eaves troughs and edges of the roof line to reduce ice damming under the roof covering.
- For flat roofs, identify roof drains with 3-4 ft. high flags in case of heavy snow build-up. Clear the roof drains and open paths to the drains to ensure drainage.

Pay Particular Attention to...

- Roof sections with changes in elevation - snow accumulates on the lower section.
- Additions to the sides of higher buildings with steep roofs such as dressing rooms attached to sides of arch roofed arenas - snow build-ups on an arena roof could crash down onto the dressing room roof.
- Roof sections with long expanses with unsupported roof trusses.

Clearing Snow/Ice Accumulations

- Remove snow in a systematic pattern to avoid a build-up in any one location that would overload the roof in that area.
- Identify and clear snow from any roof hatches and sky lights to prevent staff from walking on, and possibly falling through, these openings.
- Use safety rigs and lines to prevent staff from falling off a roof.
- Erect barricades surrounding the building where snow/ice is being removed to keep vehicles and pedestrians away from falling snow area.
- Avoid using ice picks or sharp tools that could damage the roof.
- To avoid damage to the roof covering, do not attempt to remove all of the ice cover (leave 2-3").
- Use portable steam jets to remove ice build-ups on steep sections and to avoid damaging the roof.

Icicles and Ice Patches

- Icicle build-up on the edges of the roof line can fall and injure pedestrians walking by or cause damage to vehicles parked near the building.
- Water draining from downspouts will freeze and create large ice patches that could be serious slip-and-fall hazards if near entrances or walkways.
- Potholes and low lying areas in parking lots will retain water and freeze into ice patches that present a potentially hazardous area for pedestrians and vehicles.

Preventing Slip and Fall Claims

Exterior

- Regularly check for icicle build-up around the roof line and remove the icicles.
- Barricade the area below, where icicles often build-up, to prevent pedestrians from walking under the icicle area, and to prevent cars from parking near the building where icicles could fall.
- Redirect roof downspouts away from entrances and walkways.
- Sand and/or salt icy areas around entrances and handicapped parking areas.
- Check parking lots for potholes and water pooling areas and fill these in if possible. Sand icy patches in the parking lots.
- Clean snow, ice and water build-up around entrances, exits, sidewalks and ramps.

Interior

- Ensure that carpets, floor mats, stair runners and handrails are in good condition (not loose, torn or curled edges).
- Place safety cones and warning signs around entrances that may be wet and slippery from snow tracked in. Mop up excess moisture and dry floors as soon as possible. Use mats to absorb snow/water.
- Clean mats regularly, especially during wet/slushy snow seasons.

Reducing Liability

Prevailing laws set out the duty (one of reasonable care, not perfection) that a property owner/lessee/manager owes to any person entering the premises. Reasonable care would include regular inspection and maintenance of the property with increased frequency during periods of inclement weather such as following a heavy snow or freezing rain storm, or during the thaw/freeze season.

Document, Document, Document

Document all actions on log sheets, even if it is only an inspection where no further action is required. Maintenance logs are the evidence you need to prove that you have met the Duty of Care needed to avoid liability in the event of an incident.

Notes:

- Structures constructed with building permits are designed for 40 lbs./sq. ft. minimum roof snow load. Older roofs may be of concern and may not meet this minimum roof snow load.
- Until recently, manufactured homes were designed for a roof snow load of 30 lbs./sq. ft. Look at the certification label (a metal label affixed to the manufactured home) to verify your roof snow load.
- Flat roofs are more of a concern (less than 3/12 pitch). Flatter roof pitches tend to hold more snow moisture.
- If we receive excessive rainfall, the weight of the roof snow can increase rapidly.
- If your structure is in question, it is best to consult a licensed engineer.

Please be aware of the potential dangers of shoveling or raking snow from a roof. Aside from possible damage to the roofing materials and structure, there are other hazards that may occur, such as a person sliding off the roof, falling off of a ladder, overexerting themselves or incurring an injury from snow sliding on top of them.

We do not make recommendations on when to remove snow from roofs. It is up to the individual property owner to consider the benefits and dangers of snow removal and decide their own course of actions. Remember that as a rule of thumb, saturated snow weighs about 20 lbs. per cubic ft. and then consider the depth and relative moisture content of your snow and the capacity of your roof structure in making your decision to remove snow or not.