Snow Load Safety Guidance Information

Warning Signs of Overstress Conditions during a Snow Event

Warning Signs of Overstress Conditions during a Snow Event Overstressed roofs typically display some warning signs. Wood and steel structures may show noticeable signs of excessive ceiling or roof sagging before failure. The following warning signs are common in wood, metal, and steel constructed buildings.

• Sagging ceiling tiles or boards, ceiling boards falling out of the ceiling grid, and/or sagging sprinkler lines and sprinkler heads

• Popping, cracking, and creaking noises coming from the roof system

• Sagging roof members, including metal decking or plywood sheathing

• Bowing truss bottom chords or web members

• Doors and/or windows that can no longer be opened or closed

• Cracked or split wood members

• Cracks in walls or masonry

• Severe roof leaks

• Excessive accumulation of water at nondrainage locations on low slope roofs

Key Safety Issues and Risks

Snow accumulation in excess of building design conditions can result in structural failure and possible collapse. Structural failure due to roof snow loads may be linked to several possible causes, including but not limited to the following.

• Unbalanced snow load from drifting and sliding snow. When snow accumulates at different depths in different locations on a roof, it results in high and concentrated snow loads that can potentially overload the roof structure.

• Rain-on-snow load. Heavy rainfall on top of snow may cause snow to melt and become further saturated, significantly increasing the load on the roof structure.

• Snow melt between snow events. If the roof drainage system is blocked, improperly designed, or maintained, ice dams may form, which creates a concentrated load at the eaves and reduces the ability

of sloped roofs to shed snow. On flat or low slope roof systems, snow melt may accumulate in low areas on roofs, creating a concentrated load.

• Roof geometry. Simple roofs with steep slopes shed snow most easily. Roofs with geometric irregularities and obstructions collect snow drifts in an unbalanced pattern. These roof geometries include flat roofs with parapets, stepped roofs, saw-tooth roofs, and roofs with obstructions such as equipment or chimneys.

Methods of Snow Removal

Below are some recommended methods of snow removal that allow the qualified individual to remove snow safely and minimize risk of personal injury and property damage.

• Removing snow completely from a roof surface can result in serious damage to the roof covering and possibly lead to leaks and additional damage. At least a couple of inches of snow should be left on the roof.

• Do not use mechanical snow removal equipment. The risk of damaging the roof membrane or other rooftop items outweighs the advantage of speed.

• Do not use sharp tools, such as picks, to remove snow. Use plastic rather than metal shovels. • Remove drifted snow first at building elevation changes, parapets, and around equipment.

• Once drifted snow has been removed, start remaining snow removal from the center portion of the roof.

• Remove snow in the direction of primary structural members. This will prevent unbalanced snow loading.

• Do not stockpile snow on the roof.

• Dispose of removed snow in designated areas on the ground.

• Keep snow away from building exits, fire escapes, drain downspouts, ventilation openings, and equipment.

• If possible, remove snow starting at the ridge and moving toward the eave for gable and sloped roofs.

• In some cases a long-handled non-metallic snow rake can be used from the ground, thereby reducing the risk. Metal snow rakes can damage roofing material and pose an electrocution risk and should be avoided.

• Upon completion of snow removal, the roofing material should be inspected for any signs of damage. Additionally, a quick inspection of the structural system may be prudent after particularly large snow events. If you have any additional questions on this topic or other

Safety Measures for Snow Removal

Below are some safety measures to take during snow removal to minimize risk of personal injury.

• Any roof snow removal should be conducted following proper OSHA protocol for work on rooftops. Use roof fall arrest harnesses where applicable.

• Always have someone below the roof to keep foot traffic away from locations where falling snow or ice could cause injuries or post caution signs.

• Ensure someone confirms that the area below removal site is free of equipment that could be damaged by falling snow or ice.

• Whenever snow is being removed from a roof, be careful of dislodged icicles. An icicle falling from a short height can still cause damage or injury.

• When using a non-metallic snow rake, be aware that roof snow can slide at any moment. Keep a safe distance away from the eave to remain outside of the sliding range.

• Buried skylights pose a high risk to workers on a roof removing snow. Properly mark this hazard as well as other rooftop hazards.

Warning! Snow removal is a dangerous activity that should only be done by qualified individuals following safety protocols to minimize risks. If at any time there is concern that snow loads may cause a collapse of the roof structure, cease all removal activity, and evacuate the building.

Warning! If any of these warning signs are observed, the building should be promptly evacuated and a local building authority and/ or a qualified design professional should be contacted to perform a detailed structural inspection.

How much snow will your roof system really handle?

Snow accumulation in excess of building design conditions can result in structural failure and possible collapse.

Snow removal is a dangerous activity.