Winter Storms and Your Building Projects

EXCESSIVE SNOW ACCUMULATION

Heavy and/or repeated snow storms can create packed snow and ice such that only a few feet of depth may weigh 50 pounds per square feet or more, imposing unusual and excessive loads on any building structure. Blowing and drifting snow can easily double these loads and rain on snow can also cause significant load increases. An excessive accumulation of snow can cause a building to be loaded beyond design capacity creating a risk of building damage or even collapse.

Your building is designed per Kentucky building code (KBC) requirements during the given year your building was constructed. In Louisville and the surrounding counties the building was designed for 20 pounds per square foot snow load on your roof. The KBC requirements are based off of average historical calculations for this area and illustrated in the code book for design guidance and compliances.

WHAT TO LOOK FOR

Most snow related losses occur at stepped elevations where blowing snow is carried from the roof of a higher building onto the roof of a lower building. Such drifting normally occurs where the buildings are attached. However, drift loads can also form on closely adjacent buildings, over ridges, at valley conditions, behind parapets, next to rooftop units, and on below-eave canopies or overhangs. Post construction changes to the building site, such as the addition of higher buildings or significant tree growth, can cause drifting where none was anticipated. Modifications to the structure, loads added after the original design (such as piping, roof units, hanging heaters, etc.) and prior damage to the structure are other areas of particular concern because they may have significantly reduced the capacity of the building to withstand snow loads.

DAMAGED THAT CAN OCCUR

Your building could experience damage odd characteristics with heavier than normal snow loads on the roof. Some possible characteristics you might see are, 1. Your acoustical ceilings might sag in the offices. This appearance will look like the roof is caving in. Don't be alarmed. The ceiling grid is sometimes fastened to the roof and will sag as the roof flexes with the snow load. The roof is designed to sag with the snow load. Once snow melts off the roof the roof will go back in place and the ceiling will return to normal along with the roof. 2. Sometimes ceiling tiles fall out with the ceiling while sagging. This is also normal. Once the roof goes back in place the ceiling will raise back in place and the tiles can be put back in after the roof thaws. 3. Sprinkler pipe drips. In some cases with heavy snow and roof flex your fire sprinkler pipes in the roof will sag and may give at the pipe joint. This is also normal in some cases with heavy snow load. Once the roof goes back in place it is recommended to call the fire sprinkler company and check the pipe joints once the roof is back normal. 4. Roof penetrations. In many cases as the roof sags with snow weight there may be roof pitch pockets and vent penetrations that could spring leaks due to the stress of the sagging roof. This too is normal and can be repaired after the snow event is melted off. These are a few common items that may occur with heavier than normal snow events.

WHAT TO DO

'We have shared with you the different items and potential damage which can occur when excessive snow accumulation is present. Much of the public is unaware of the consequences of allowing snow building on their roofs. However, many property insurers are beginning to provide their insured with information on what to do in the event of a snow emergency, such as advising building owners to activate a snow watch and removal crew to monitor snow depths and to remove excessive accumulations of snow from the roofs. Additional warnings from you may help prevent significant damage from occurring.

Building owners should also be advised to keep drains and gutters clear of ice and snow to facilitate melting run-off. Ice and snow build-up can cause excessive loads even without drifts. Heat tapes in gutters and downspouts may assist in preventing ice build-up, except during extremely low temperatures. Building owners should also be aware of warning signs inside the building that may indicate excessive snow accumulation, including the deflection of purlins, the popping of ceiling tiles in drop ceiling, and unusual noises. If any of these situations occur, the building owner should be advised to contact you immediately for assistance.

SUGGESTIONS ON HOW TO DEAL WITH A ROOF NEAR COLLAPSING

Personnel safety is of utmost concern both during the shoring operation and during snow removal. Adequate precautions must be taken.

If a roof is in danger of collapsing, the building should be immediately evacuated and the following emergency procedures are recommended:

1. In many situations, the most effective solution is shoring of the purlins. In most large cities, commercial shoring service is available. If not, timbers may be used.
2. In some cases, removing snow build-up may be sufficient. See below for detailed snow removal information.
3. Large industrial heaters inside the building may also assist in melting snow and ice from the roof.

In case of a collapse or threatened collapse, contact your Builder.

IN CASE OF COLLAPSE

In case of a roof collapse, mitigation of loss should be the first priority. Damage to contents is a major concern and prompt snow removal is imperative. Once the snow is removed, the next step is construction of temporary cover to keep the weather out and allow clean-up to begin. Documenting the snow loads and resulting damage is also essential. For your reference, this page contains a procedure Butler uses in these situations. Your assistance in gathering this information would be most helpful. Fast response by you to these emergency situations can help your client get back into business quickly. Butler Manufacturing stands ready to work with you in these situations.

SNOW/ICE REMOVAL

Every situation is different so careful planning must be conducted before removal begins. If you choose to remove:

1. Always provide proper safety precautions when working on the roof, especially along the edge of the roof. Never send one person on a roof to remove snow alone. Place ladders at the end of the building so sliding snow will not dislodge them.
2. Remove drifted areas first, down to the level of the snow on the remaining roof. Next, remove the snow from the middle 1/3 of each bay (from eave to eave), beginning with the most snow-packed bay. Complete snow removal on the remainder of the building. On gabled buildings, remove snow on both sides of the ridge at the same time.
3. Remove snow in a pattern that does not cause an unbalanced loading condition. Avoid the large differences in snow depth between adjacent areas of the roof. Remove snow gradually in layers from all over the roof.
4. Remove snow from eave toward ridge, but be cautious of snow or ice breaking away and sliding down the roof. Prior to removing snow from the roof, remove all hanging icicles from eaves and gutters. These can be quite heavy and may prevent snow from being pushed off the roof.
5. Do not pile shoveled snow on other areas of the roof or on other roofs. Keep dumping area clear of all persons and property.
6. Always use plastic shovels. Do not use picks, axes or other sharp tools.
7. Do not attempt to remove snow by washing it off with a hose. Snow acts as a sponge and will rapidly absorb water, increasing the loads on the roof and potentially causing failure.
8. Be careful to avoid hitting panel straps, fasteners, snow guards etc. with snow removal equipment. Care must also be taken in removing snow and ice around ventilator bases, pipe flashing, rooftop unit supports, conduits, etc., since such items are easily damaged.
9. Be aware of skylight systems locations. These panels are not intended to support roof foot traffic loads.

If you have any concerns or need help during a snow event you can call Sean Turner at 859-333-3364