



DATE: November 1, 2018

ACTION: Please Circulate in Your Organization as Needed

Winter Storms and Your 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 psf 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.

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.

WHAT TO DO

We recommend that you make end customers aware of the damage which can occur when excessive snow accumulation is present. Much of the public is unaware of the consequences of allowing snow buildup on their roofs. However, many property insurers are beginning to provide their insureds 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.

As a preventative measure, when placing an order, always be sure that Butler is fully advised of any conditions that may potentially cause an accumulation of snow, such as stepped elevations, closely adjacent buildings, ridges and valleys, parapets, roof top units, below-eave canopies, and the like.

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 reverse side for detailed snow removal information.
2. 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 Area Manager

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.

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.

DOCUMENTING SNOW LOADS AND RESULTING DAMAGE

General

Builders should notify their Butler Area Manager anytime a building suffers any damage or collapse due to excessive snow.

Procedure

1. The most important task is to get to the site as quickly as possible to perform a full investigation.
2. Assistance from the Builder is necessary to make arrangements with the customer and accompany the Butler representative to the site. One or two laborers from the Builder's crew would be very helpful.
3. Equipment required
 - a. A camera;
 - b. 50' tape;
 - c. Shovels;
 - d. Yardstick (with legible numbers suitable for photographing);
 - e. A scale and suitable container for weighing snow;
4. Obtain photos of:
 - a) Building overall views from as many sides as possible;
 - b) General interior views;
 - c) Detail photos of individual members which might indicate nature of failure;
 - d) Damages to contents or lack of damages;
 - e) Multiple photographs of the snow both on the building and surrounding areas, any drifts and snow sampling procedure.
5. Make notes keyed to the above photos as to description and location of parts. Sketch building plan showing failure area, collapsed position of main members, etc.
6. Snow Sampling Procedures:
 - a) Obtain representative samples of undisturbed snow on the roof. Take samples as close to the collapse area as is safely possible. Samples from other areas of the roof should also be taken. If the roof is inaccessible, take samples on the ground reasonably close to the building. Use the yardstick and carefully measure a 1 ft. x 1 ft. area and the snow depth. Weigh this block of snow by using the scale and container (do not forget to subtract the weight of the container). Photograph samples and weighing procedures. This procedure must be repeated at several locations on the roof, if possible.
 - b) Make a building plan sketch showing the snow distribution and where the weight sample or samples were taken. Identify snow drift locations and indicate any adjacent roofs or walls that would or did cause dumping or drifting conditions.
 - c) Note snow depth on roofs of buildings in the general area and on the ground in the area of the building.