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PUBLIC EDUCATION SECTION

HOT TOPICS
FIRE SAFETY INFORMATION SHEET

Roof Snow and Ice Safety

Vermont winters can be a very damaging season with severe cold and temperature swings, blustery winds, ice and snow. Excessive buildup on roofs can create excessive snow loads that can damage your building You should monitor the snow load situation on your buildings and take appropriate actions.

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**
- **Sprinkler heads deflecting below suspended ceilings**
- **Popping, cracking, and creaking noises**
- **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.

During Heavy Snow Events

Inspect barns and other buildings for signs of wreaking or collapse. Utilize safe practices when removing snow buildup on roofs.

When you go to work, check to see if the emergency exits are clear if you smell unusual orders or hear strange sounds that might be a clue to a possible problem, let someone know.

The removal of snow accumulations on roofs, which will take the weight off the roof, is the best way to prevent a loss. It is important to follow proper snow-removal procedures. A plan should be developed based on your building's layout. Improper snow removal can create undesired loading on a roof.

Follow these procedures to properly remove snow from your roof:

1. Use a snow roof rake if at all possible. This allows you to be safely on the ground in a safe place.

2. Use fall protection equipment when employees are working on a roof.

3. If ladders are used, locate and secure them so they do not fall.

4. Drifted snow should be removed first, which will generally be on lower roofs. Drifted snow can also occur around rooftop mechanical vents, skylights, parapet walls and around penthouse walls.

5. Remove snow in narrow strips instead of large areas to help keep loading somewhat uniform.

6. It is important to remove snow evenly from both sides of the roof so that the live load on one side of the roof is not significantly greater than the other side. For peaked roofs, the snow should be removed from the center of a given bay on one side of the roof and then the snow should be removed on the same bay on the other side of the ridge or peak.

7. Do not pile snow from upper roofs onto lower roofs.

8. Take care while removing snow and/or ice accumulation to prevent damage to the roof membrane. Use plastic shovels or wooden roof rakes to avoid damage. The uses of snow blowers are discouraged.

9. When removing snow from one section of a roof, avoid traveling over and compacting snow on adjacent roof sections.

10. Cordon off the deposit area on the ground and monitor the area to ensure that pedestrians or vehicles do not enter this area.