Snow loads on roofs

What is the hazard?

Building structures may collapse as the result of the pile up of snow or ice, particularly if the load is unevenly distributed on the roof, for instance between adjacent ridge or arch roofs.

Snow and ice falling or dropping from high structures can cause property damage, injuries or even fatalities. Rapidly changing weather conditions or snow storms have often been the ultimate cause that has led to a catastrophic accident.

How to reduce the risk

- Check the roofs on a regular basis, and particularly before each winter. Check that there are no leaves or other materials blocking the roof's rainwater drainage system. A dented roof structure implies that there is an imminent danger. Warehouses, sheds and light-structure roofs might need more attention than other constructions.
- Assess whether or not you need to provide more detailed guidelines on measuring the snow depth, taking samples and assessing the snow load. For this, you need to know the design code, i.e. what is the maximum snow load the roof is designed to carry. The design codes are in most cases given in the national regulations. However, it is possible that they might have been changed over the years, meaning that the older buildings might not have been built according to modern standards. On the other

hand, in modern buildings, the tolerance regarding the snow load might be lower than in the older buildings, meaning that the actual load must be very carefully monitored to ensure that it does not exceed the load permitted by the design code. It is also wise to check national regulations and obtain advice on the measuring of snow depth, sampling and assessment and calculation of snow loads.

- Monitor the weather conditions and pay special attention to warnings given by the authorities and local weather institutions etc. Rapid changes in temperature and oncoming snow storms probably require imminent measures to be taken to avoid a loss or prevent an accident.
- Consider installing on the roof a snow load monitoring device, which will provide you with continuous up-to-date information regarding the snow load.
- Especially in long span buildings, the measuring of the bending of the roof girders is a common method for monitoring the load on the building structures.
- Consider, based on local experience, installing trace heating to the roof drainage systems.
- Remove the snow load evenly from the different parts of the roof whenever necessary. If you remove snow from a ridge or an arch roof, then an equal amount of snow should be removed from both sides of the roof. Do not pile snow from upper roofs onto lower roofs.
- Avoid damaging the roofing by leaving a thin layer of snow on the roof.
- Employ only skilled snow removers. They should have a valid third party liability insurance policy in force.
- Ensure that the snow removers comply with the appropriate personal safety measures (e.g. that they always wear a safety harness). Ensure that the passers-by are not endangered by falling snow and ice. This should apply not only during the removal of snow but also, when snow and ice have accumulated on roofs, structures and equipment.
- When snow has been removed during the winter, it is important to inspect the roof at the earliest possible opportunity to check whether or not there are any holes or other damage, which could result in e.g. water damage to the roof construction.
- If you notice that a tree with a heavy snow load has bent over a power line or fallen onto it, contact the local power distribution company. Do not attempt to remove snow or fell the tree yourself. It is too dangerous. Trees should only be felled by the power distribution company's own skilled personnel or with their permission.

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