

TECH BULLETIN

CFR Prone to Snow and Ice



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CONSIDERATIONS FOR ROOFS PRONE TO SNOW AND ICE ACCUMULATION

A typically overlooked design consideration for roofs are installations in areas that receive heavy snow and ice accumulations. If this consideration is overlooked, owners and designers are reminded when unusually cold and wet winters occur. Roof systems should be evaluated for conditions that would allow the formation of ice dams or uncontrolled sliding snow.

An ice dam is the accumulation of ice that stops the flow of water off of the roof. The ice dam begins to form at the drip edge along the low roof eave or the gutter. Water from snow melt runs down the roof until it reaches a surface that has a temperature below freezing, at that point the water freezes to that surface and starts the formation of an ice dam. Ice Dams typically begin to form when the ambient air temperature is 22°F and below. Water then begins to accumulate behind the newly formed ice dam. Eventually, the water overflows the initial ice dam and in the process, freezes on top of the lower level of ice. As long as the temperatures remain below freezing and there is a source of water, the ice dam will continue to grow. In extreme cases the weight of the ice will damage gutters and even panels. The ribs of the panels can become completely submerged by water. Water can possibly enter the building at the wall to roof intersection or through the standing seam if there is any deficiency in the seam sealant or seaming of the panel.

Snow falls in a variety of densities and moisture contents. Melting and refreezing “ripens” the snow creating different layers. The different layers create shear planes that permit the movement of upper snow layers under the right circumstances. Due to the low coefficient of surface friction of metal roof panels, the shear plane may form at the skin of the panel. The potential for snow slide is greater as the pitch of the roof is increased. If sliding snow is not controlled, damage could occur to the gutter, lower roofs, or persons or property on the ground.

There are various methods to address these issues, such as the elimination of gutters, adding snow retention systems, ice melt systems and super insulated roof systems (>R38). This evaluation should be conducted by the designer of the project or by a manufacturer that designs solutions for controlling ice and snow. TrueCore is not responsible or has the expertise to provide this type of design guidance.