

essentials

Snow guards for metal roof systems

by **James R. Kirby, AIA**

Although the end of winter is near, the possibility of snow and ice still exists in many regions. Therefore, it is important to address how to control snow and ice from sliding off metal roof systems.

Because metal panels have smooth surfaces and quickly transfer heat, snow and ice tend to loosen and slip suddenly from panels. In locations where ice and snow occur frequently, snow guards may be desirable, particularly if a metal roof's eave is positioned over pedestrian or vehicular traffic areas.

If snow guards are used, it is best not to penetrate metal panels with exposed fasteners—this helps avoid potential leakage. Snow guards should be attached with manufacturer-recommended sealants at flat-pan areas or nonpenetrating fastening at standing seams. Nonpenetrating attachment is preferable to penetrating metal panels, and rigid attachment (set screws) is preferable to using sealants.

Installation

Snow guards are separated generically into two types: individual and continuous fences. Individual-type snow guards typically are adhered to the flat-pan areas of metal panels, and continuous fence-type snow guards typically are mechanically attached to standing seams.

If adhesives are used to adhere snow guards to metal panels, it may be prudent to install snow guards during warm weather. Warm-weather installation is beneficial for a number of reasons, such as it is easier for crew members to work in warm weather; warm weather generally is more conducive for the curing of adhesives (sealants);

and warm weather allows ample time for the curing of adhesives before they are stressed by the weight of snow and ice.

However, installation of snow guards creates a potential for the buildup of snow, debris and ice. In addition, water dams can occur, which may result in leakage. The installation of an ice-dam protection membrane is recommended under and upslope areas with snow guards.

There may be a need for additional panel clips where snow guards are installed because of the anticipated weight of snow and ice and resulting drag load on panels. Consult snow-guard manufacturers for specific requirements. If snow guards are used, designers must be aware that snow and ice buildup on an assembly will add additional weight to the assembly and structure. Designers of metal panel roof assemblies should consult applicable building codes to determine the appropriate snow loads for buildings' localities.

For reroofing projects that require adding snow guards, it may be necessary to determine whether an existing roof's structural assembly has the capacity to carry anticipated snow loads. If a structure has not been designed to accommodate snow loads, snow and ice buildup potentially may overload the structure's capacity.

Designers should realize that the benefits of preventing sliding snow and ice (hazard reduction) need to be weighed against the disadvantages (increased roof loads and potential for ice dams). Limiting the installation of snow guards to roof areas where sliding snow may affect traffic areas and pedestrian entrances may be the most appropriate solution to the dilemma.

For localized installations, single

lines of snow guards may be adequate. When large areas of snow and ice need to be retained, such as along the entire length of one side of a building, using multiple lines of snow guards is preferable. It generally is better to use multiple or staggered lines of well-spaced snow guards instead of a single line at an eave. Single lines of snow guards along an entire eave likely will be overstressed from ice and snow buildup. This stress may damage snow guards and a metal panel roof system and create potential leak locations.

It also generally is best to locate the lowest snow guards near an eave but not within the overhang because this could facilitate the buildup of ice dams. The lowest snow guard should be located at least 12 inches (300 mm) inside the interior face of an exterior wall.

Take action

Now is the time to talk to your customers about installing snow guards before next winter.

For additional information, refer to "Snow Guards for Metal Roofs," by Wayne Tobiasson, James Buska and Alan Greatorox, researchers with the U.S. Army Corps of Engineers' Cold Regions Research and Engineering Laboratory (CRREL), Hanover, N.H. The research paper can be obtained by contacting CRREL at (603) 646-4100.

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