SNOW RETENTION SYSTEM COMMENTARY

Designing for snow and ice retention systems requires an analysis that includes many factors, including but not limited to:

- Anticipated weight of the highest snow load.
- Roof pitch – steeper angles will put a greater load on a snow retention system.
- Length of the roof – on long roof runs two or more lines of snow retention systems may be needed to avoid the entire load being concentrated along a single snow retention line. Also, this reduces the potential for inertial loads sliding down against a single snow guard retention line.
- Drift loads since snowfall will drift on roofs, just as it does on the ground.
- Location of supporting members or walls in relation to snow retention system—snow retention lines should be positioned over walls, porch columns, and similar load bearing construction features.
- Heat from the building—if a portion of the roof is over an unheated porch or walkway snow could accumulate over an extended period. In such cases the inclusion of a direct heat source might be prudent.

For larger buildings and roofs in areas of high snowfall a structural engineer must be included in the design team. Consider the potential for liability if a few tons of snow overpower the snow retention system and fall or the snow-retention system overloads the structural capability of the roof and its underlying supporting system. Architects and building designers must create an integrated system design, not just call for snow guards on the construction plans. Only the building's designer knows all the buildings structural specifics to ensure that all the factors in the design of snow retention systems are considered—the design starts at the foundation, moves up through the building's structure to the final selection of the actual snow retention system.

Many snow retention manufacturers will offer suggested design layouts for a system appropriate to the geography and to the information provided of a specific building but typically recommend the inclusion of input from an architect, engineer, or designer. Neither a manufacturer nor an architectural contractor has all the information to design a snow retention system. In some cases, the snow retention system must be designed to fail if the structural load of the retained snow and ice is approaching that of the building's structure. All snow retention systems will fail at some point.

The most commonly used methods of retaining snow/ice for metal and non-metal roofs are snow guards, which can be either mechanically fastened or adhered with adhesives, and snow fences, which are fastened or clamped into place. If possible, select a method that does not penetrate the roof. Several systems are available that mechanically fasten to standing seams, for example.

Employees or workers should never attempt to clear a snow retention system of excess snow from the down-slope side of the roof—below the accumulated snow. Snow that has accumulated over a period of several days can be compressed by freeze/thaw cycles or have high ice content with overall weights that may reach into the tons.

Continuous pipe style snow guards are the most effective snow retention method, especially in areas subject to high annual snow falls and where cold temperatures can cause snow to remain on roofs for prolonged periods and accumulate with each additional snow fall. Designers must also be mindful that buildings constructed under the newer codes are likely to accumulate more snow than has traditionally occurred since the envelops are more efficient which results in less internal heat "escaping" to assist in melting snow as it accumulates.