

# CODES AND ROOF SNOW RETENTION

BY TERRY ANDERSON

Picture three feet of snow and ice sitting on the roof above your front porch. The sun is out heating the frozen snow, and your four-year-old son is riding the brand new bike he got for Christmas. The codes that were followed when the roofing contractor installed the snow retention on your roof will protect you and your son from being hurt by snow that might fall off the roof, right? What would you think if I told you there are no codes to protect us from falling snow and ice? Thousands of codes have been developed for construction all over the country. However, roof snow retention has never been addressed. Why do we stand by and allow millions of dollars of property damage and even deaths to occur every year from sliding snow? Codes governing products, installation procedures, and standards are not in place to protect the consumer. In fact, currently anyone can cast a wax snow guard, spread some cement on the bottom, tell the consumer how to install it without any testing whatsoever, and then market it. Inferior products are out there with no consumer protection in place. Roofers and roof consultants are left with the daunting task of judging whether or not what they are specifying and installing will provide adequate safety and effectiveness in snow areas.

As a roof consultant, what methods should be used to determine which types of snow retention products to recommend? Are you



*Photo 1: Damage to flat seam metal roofing.*

assuming that the snow retention manufacturers have engineered their snow retention products from the fail point of the roof system? Are the current U.S. codes providing the standards to assure safety from sliding snow?

I began an investigation to answer these questions. It has been my conclusion that

architects, roof consultants, builders, and roofing contractors make a lot of assumptions concerning snow and ice, and we often fail. The simple truth is that most snow



*Photo 2: Dormers can be torn off.*



*Photo 3: People and property below can be in danger.*

retention manufacturers do not design their product from the fail point of the roof system, resulting in many failures! There are no ICC codes for snow retention. The norm for the roofing industry is to just do what you have done in the past or guess that three rows at the eave of the roof will be just fine.

There is another industry that one would think ought to have taken a lead in this life-threatening concern. The insurance industry is often expected to pay for failures of inadequate systems. In the state of Utah, where I live, two children have been killed from snow and ice falling off roofs. As you can see in the photos, snow and ice have caused death, vehicle damage, and roof and gutter damage. What is the common reason for denying claims caused by falling snow and ice? An "Act of God," not covered by the policy.

Is snow and ice falling off the roof truly an act of God? It is true that we don't have control over snow and ice movement on roofs. Many respected members of the architectural and roof consulting industries have claimed that snow guards and snow brackets simply do not work. There is a bit of truth to these assertions as some of the photos display. However, the majority of the time, good design and installation will prevent glacial snow and ice movement on roofs and prevent many unnecessary claims to insurance companies.

Comparing how Europeans and Americans design their snow retention systems explains some reasons why the standards in America are not working. In America we have no standards, whereas in Europe, designers look at the potential fail points of the roof and then design the system from that starting point.

There are six key questions to ask when planning a roof snow retention system:

1. What is the sheathing type and thickness and how is it attached to the substrate?
2. How is the snow bracket attached to the sheathing? How many fasteners per bracket are required and what is the pullout load of each fastener in the particular type of sheathing?
3. What are the fail point loads of the snow bracket?
4. What is the slope of the roof?
5. What is the ground snow load?


#### 6. Where and how might ice dams occur?

After they have gathered all this information, European engineers develop layout charts using all the data. These charts include specific types of roof and snow brackets installed on different sheathing types and thicknesses, snow loads, roof slopes, and the number of snow brackets needed per roofing square. Then snow brackets are placed according to the layout charts from eave to the ridge, which eliminates all snow and ice movement. This protocol results in placement of snow retention devices from eave to ridge, never just along the edge.

I have used the above steps on roof design projects throughout snow areas of the U.S. and Canada and have had great success from following these six engineering guide-

lines. The snow and ice is restrained in place across the entire roof. It just melts in place in the spring, eliminating damage to people or property and so-called "Acts of God."

I am currently working with local code bodies to submit a standard to the International Codes Council (ICC) requiring snow retention manufacturers to provide certified data from the fail point of the roof system and not just from the standpoint of the individual snow retention device. Roof consultants' support of new standards will improve our roofing industry and provide for the safety of people, property, and roof designs. Until a comprehensive standard is accepted and approved, all roof consultants would be wise to work with manufacturers who will provide them with this type of comprehensive data and then design roofs in accordance with the six suggestions above. This will help ensure customers are getting a quality design and protect consultants from lawsuits if someone is maimed or killed or property is damaged by falling snow and ice.

Let's all work together as RCI members and see that such standards are adopted. If you have any questions on this article or would like to help to push this standard, please contact the writer at (801) 756-9811. 



*Photos 4 and 5: Snow fences used alone were not able to prevent damage.*

#### Terry Anderson

Terry Anderson has been involved in the roofing industry for over 25 years and is the owner of Anderson Associates consulting in Highland, Utah. He is a member of RCI, WSRCA, and NRCA. Anderson has also served on the committee for tile roof applications in snow and ice areas for NTRMA and WSRCA. He co-authored the *Concrete and Clay Tile Roof Design Criteria Manual for Cold and Snow Regions*, published by the NTRMA and WSRCA. Anderson has conducted research in Europe.

