DAMAGED METAL ROOF
DUE TO SHEDDING SNOW.

Shed it or Keep it?

Making a Decision about Snow & Ice on Metal Roofs

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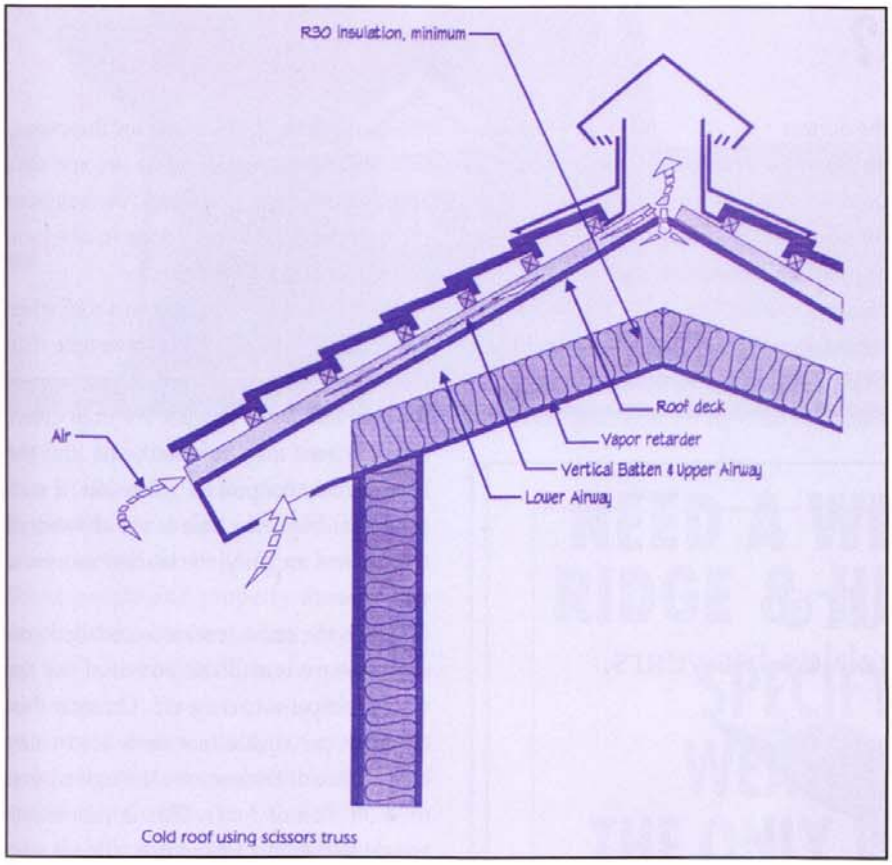
How would you answer this question? If you are like most roofing consultants or architects, you would probably say, "Shed the snow and ice." This is the correct answer in some cases, but a few things must be considered when making this decision. If you decide to allow the snow to shed, you must take into account the following:

- Penetrations through the roof should be positioned near the top of the roof, within 5' of the ridge line. Why? If snow and ice is allowed to move, its force will break off any penetrations through the roof. Moving



Cold roof using scissors truss

forces are minimized the higher up the slope you go. This design change alone will make a big difference by stopping penetration damage from occurring.

People and property should not be allowed in areas of shedding snow and ice. Why? In the past two years there have been at least three deaths in Utah and Colorado caused by sliding snow and ice off roofs. These deaths could have been prevented if people had not been in areas of sliding snow and ice or if the snow and ice had not been allowed to move. Even professionals such as architects and consultants are not always alert to the danger to people and property.

One architect's Maserati was crushed by falling ice and snow. He got it repaired, but made no changes to the roof. The same thing happened the next year!

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Dormers should not be used close to the eave line when the ridge height of the dormer is much lower that the ridge height of the building. Why? Snow loads coming down on the main roof are much greater than loads sliding down from a dormer. Therefore, the snow and ice come through the small valley and do damage to the dormer valley and the roofing product on the dormer.

No snow retention devices should be used on standing seam metal roofs. Why? Standing seam metal roofs are made to expand and contract with temperature changes during the day. This expansion takes place up and down the metal sheet. Clips are used in the standing seam, rather than nails through the sheathing because of this movement. Clips allow for the expansion without causing holes to become slots and creating leak problems. Attachment through the panel is only done in one location, either at the ridge or eave.

If you glue snow brackets on a roof when it is above 40°, allow a 30 day cure time with temperatures above 40, and the surfaces of the roof and snow bracket are both clean, then the roof may hold snow on and the brackets may not pull off. However, if temperatures drop, cure time is not allowed, or the surfaces are dirty, the bracket and snow will come off.

When the snow bracket is installed correctly, there is still the potential for the whole roof panel to come off. Consider this: A 120 lb. per square foot snow load being held by two or three screws through a panel on a 30' run of roof. This is incredible weight to put on a few screws. This is why whole panels sometimes slide off the structure, as happened in the ski resort of Whistler, Canada.

Be careful about letting snow and ice build up on an outside bearing wall. Why? Often, when you hear about a building collapsing during a snowstorm, a large amount of snow and ice has fallen off the roof's eave edge and then fallen back against the outside bearing wall, collapsing the building. The weight of the snow and ice, which came off of the roof is the contributing factor to the collapse.

Gas line meters should not be installed on the side of the building where snow is shed. Why? On a house in Park City, Utah, snow and ice slid slowly down the roof. It eventually curled under the eave and then broke off. When it fell, it hit the gas line going into the house. This shot gas into the house and within a short time, the house exploded into a fire ball.

What would I, as a roofing consultant, do if I were designing a roof in a heavy snow area and the owner wanted a metal roof?

I would slope the roof to about 5:12 so that I could keep the snow on the roof and

idea in areas where layers of snow might slip off of each other onto areas where there are people, vehicles, decks, etc.

The above system has had great success in Lake Tahoe, Calif., Beaver Creek, Colo., Breckenridge, Colo., Sun Peaks, Canada, Grand Targhee, Wyoming and many more. If you are designing a roof in cold and snowy regions, a copy of Western States Roofing Contractors Association's new manual on sloped roof application in heavy snow areas is worth the nominal cost.

prevent the problems previously noted. This would also give me more architectural freedom in my design. I would then have access around the building and not worry about people and property damage. By keeping the snow on the roof, I could doll up the house with dormers, eyebrows, walkways etc.... to give it the look I want.

- I would design a cold roof system and use the snow as an insulated blanket. This would stop ice dams and also allow me to vent the attic space. This also eliminates any water vapor that may have escaped through the vapor barrier below the insulation. If you do this, remember that air intake and exhaust size are very important to be sure that enough air is drawn from eave to ridge. Check charts, such as the ones in WSRCA & NTRMA Cold Roof Manual.
- To hold the snow on the roof, I would use a flat seam metal roof. This allows me to attach a snow bracket through the metal without worrying about metal movement caused by expansion and contraction. It also prevents degrading the flat seam.
- The snow retention system I would use would be designed and engineered. I would choose a manufacturer that tested it's brackets to a fail point on a flat seam metal roof. The system would have brackets from eave to ridge to hold all the snow on the roof and not let it move. Having a system like this is similar to a snow cave in that it also insulates the building.
- I would also consider snow fences above any walkway where layered snow might be a problem. This would be in addition to snow brackets throughout the roof system. Snow fences are only necessary and a good