



AIR VENT UNIVERSITY LESSON PLAN

April Lesson Plan

Hard Cold Facts About Ice Dam Formation and Defenses



NOTE: Collage of photos is courtesy of Michael Huston, Lindholm Roofing, Chicago, IL.

It's unrealistic to expect to 100% eliminate ice dams because there are too many variables involved in their formation. The wildcard is Mother Nature and her harshness and at times unpredictable nature. But there are steps we can take to significantly reduce the frequency and severity of ice dams.

An ice dam is a blockage of ice that forms near the roof's lowest edge. The following four conditions lead to an ice dam:

1	Snowfall
2	The outside temperature drops below freezing
3	The attic temperature is above freezing
4	The low areas of the roof remain cool (and much cooler than the upper regions of the roof)

Here's a snapshot of what happens after the snowfall. If there is excessive heat loss from the warmed living space it can escape into the attic. Once it's in the attic, it can cause uneven roof deck temperatures in which the upper portion of the roof is much warmer than the lower portion. With uneven roof deck temperatures comes uneven snow melt. Specifically, the snow near the roof peak melts first and runs down the roof where it eventually reaches the cooler portion of the roof. In the right climatic conditions, it can refreeze. Melting and refreezing is problematic when it's not happening uniformly. Any additional snow melt from above can then reach the refrozen area and become blocked. In time it can find a path under the shingles, onto the roof deck, into the attic, onto the attic insulation, and perhaps into the living space on the ceilings and beyond. The best defense against ice dams is **a three-part approach** of proper attic insulation, proper attic ventilation, and waterproofing shingle underlayment.

The goal of the attic insulation/ventilation combination is to help create a cold roof. A cold roof that is similar to the exterior temperature conditions will contribute to an even melting of the snow on the roof. The aim is to minimize the extreme hot and cold temperature differences on the roof.

Part 1: Attic Insulation. Attic insulation helps minimize the amount of heat transfer from the living space into the attic. There are charts/maps available online recommending the correct R-Value for attic insulation based on climate zone. R-Value is a measure of how well the attic insulation can resist heat transfer. The higher the R-Value the greater the attic insulation's heat transfer resistance. In the end, the less escaped heat from the warmed living space into the attic the better.

For **Part 2 (Attic Ventilation)** and **Part 3 (Waterproofing Shingle Underlayment)** read the full article inside *Roofing Elements Magazine* here: [Hard Cold Facts About Ice Dam Formation & Defenses](#)

