

Ice damming and attic condensation are related—both are caused by warm (moisture laden) air migrating from the house and entering the attic. The problem may be more pronounced in newer homes since they are built tighter at the sides encouraging warm air to rise into the attic.:

- ICE DAMMING LEADS TO SIGNIFICANT DAMAGE AND LEAKS
- PREMATURE DETERIORATION OF SHINGLES AS THE WARM AIR CONDENSES ON COLD SURFACES
- NAIL POPS AND BUCKLING SHINGLES AS THE WOOD EXPANDS WHEN ITS WET AND CONTRACTS AS IT DRIES OUT
- GROWTH OF MOLD/MILDEW WHICH LEADS TO ROOF FAILURE AND RESPIRATORY PROBLEMS FOR THE OCCUPANTS

An attic with no insulation will not have ice dams—the warm attic air will melt snow as it lands and prevent much accumulation. Likewise a well insulated and sealed attic will unlikely have ice dams—there will be no warm air to melt the snow. If there is sufficient insulation to keep heat from the house escaping and there are no holes or air leaks, then the attic should be in good shape. The attic air should be cool and dry just like the outside air (ice dams are rarely seen on barns or detached garages). One of the first signs of a potential problem is to look for bare spots or melt lines (around rafters/trusses or knee walls) after a light snow or heavy frost.

Ice damming occurs when there is a significant depth of snow on the roof and outside temperatures are below freezing for a long period of time with little or no thaw in-between. The warm air in the attic melts the snow near the peak of the roof. As the melted snow reaches the colder soffit area, it refreezes creating a dam for water underneath. A good sign of an ice dam are icicles at the gutters.

There are methods to minimize ice dams and their effect. Installing self-sealing membranes about 3' from the eave under the shingles does not stop ice dams; they just prevent the water from leaking through the roof sheathing. Removing gutters will keep them from becoming ice traps, but may lead to further problems such as wet basements and perhaps foundation settlement. Electric cables may alleviate the problem but can use a significant amount of electricity as well as being an eyesore. Another misconception is to increase attic ventilation. Certainly, in the spring/summer an attic needs to be vented to dry it out. However, in the winter, the outside cold air cannot carry moisture away from the attic—passive ventilation doesn't move much air through the attic. Further, additional ventilation may make the attic colder which encourages condensation. According to the *Canada Mortgage and Housing Corporation (CMHC)*:

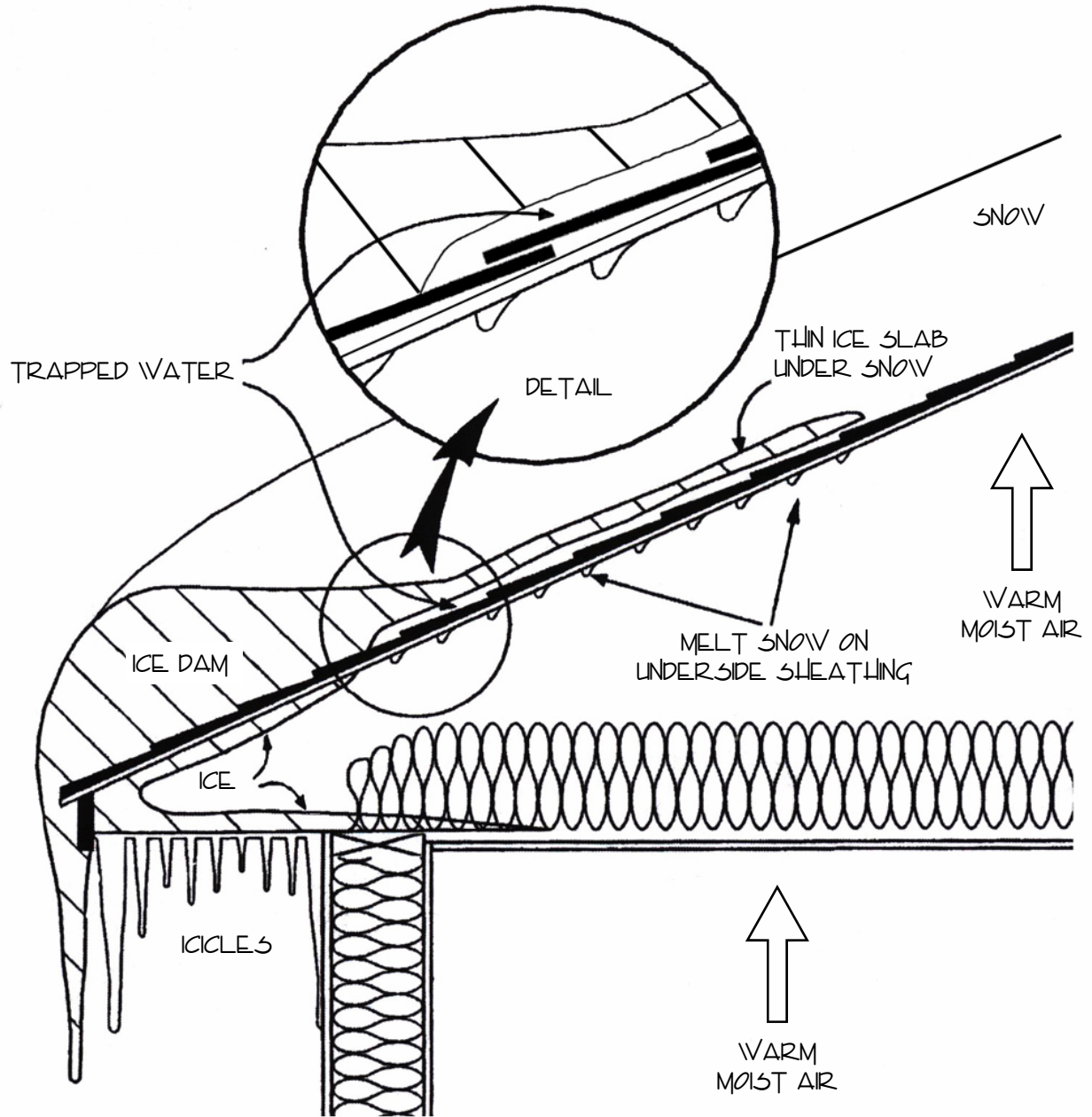
“The usual response to a wet attic is to increase attic ventilation. This is the wrong approach. In some cases, adding ventilation will actually pull more moist air up into the attic and make the problem worse. The best way to fix a wet attic is to stop air movement from the house....A well-sealed roof will not need ventilation.”

Following the principle of 1 square foot of ventilation for every 300 square feet of insulated attic space split between the roof and soffit vents (1 to 150 square feet in colder climates or low-sloped roofs) should be sufficient. Given the **"stack or chimney effect"** in a house—the tendency to draw cold air from the bottom and expel it at the top, it is important to stop all the air leaks from the house into the attic.

MINIMIZING WARM AIR INTO THE ATTIC:

- INSULATE EXHAUST FANS AND VENT TO THE OUTSIDE (USE SOLID METAL RATHER THAT FLEX DUCT)
- INSULATE HEATING DUCTS RUNNING THROUGH THE ATTIC
- INSULATE ABOVE POCKET DOORS AND LOWERED CEILINGS
- INSULATE AND SEAL THE ATTIC HATCH
- SEAL AROUND PROTRUSIONS INTO THE ATTIC SUCH AS PLUMBING STACKS AND CHIMNEYS
- SEAL HOLES MADE FOR LIGHT FIXTURES, ELECTRICAL WIRING, CABLE INSTALLATIONS AND PIPING
- SPLIT LEVEL JUNCTIONS (INTERIOR WALLS SHARED WITH ATTIC SPACE)
- SEAL CEILING AND WALL FIXTURES AS WELL AS ELECTRICAL RECEPTACLES AND SWITCHES
- SEAL DOOR AND WINDOW TRIM
- SEAL AROUND THE BASEBOARD OF PERIMETER, PARTITION, AND PARTY WALLS

For further information contact a licensed roofer or your regional EPA/HUD office in the U.S. or CMHC in Canada.



TYPICAL ICE DAMMING