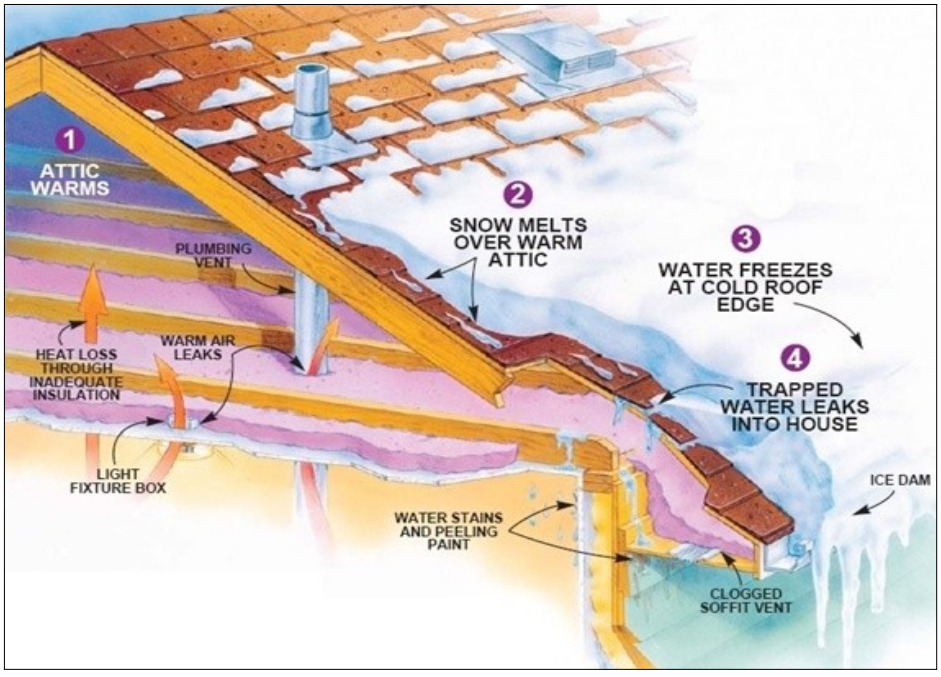
DOER
Massachusetts Department of Energy Resources

What are Ice Dams?

Ice dams form when snow melts and runs down the roof to the eaves, where it turns to ice. The “dam” created by the ridge of ice along the eaves can trap more melt water and result in significant water damage.

What Causes Ice Dams?

Ice dams occur when snow is present on the roof, the outside temperature is below freezing, and the temperature is above freezing on the roof deck (the foundation or base upon which the entire roofing system depends). Most ice dams form when heat loss into the attic warms the underside of sheathing plywood (the layer of material attached to the roof’s structural frame) that serves as the base for shingles or other materials. Warm air causes snow on the roof deck to melt and the melt water runs down to the colder edge of the roof where the water refreezes and leads to a buildup of ice and a backup of water — hence the term “dam.”

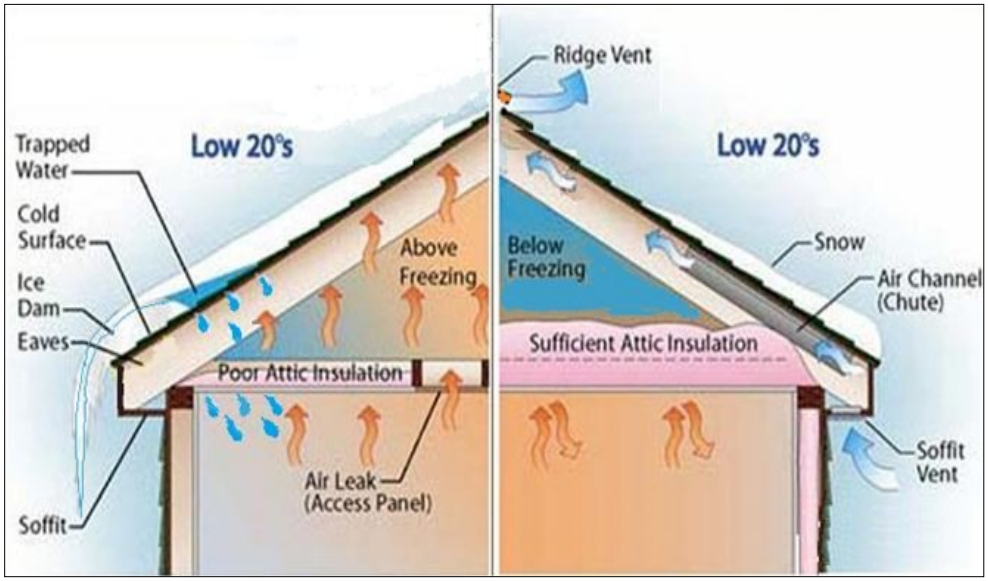


Ice Dam Impacts

- Water damage to the sheathing, the roof structure, and the ceiling and walls below
- Falling ice can be fatal
- Weight of ice leads to structural collapse of roof overhangs
- Water leaks caused by ice dams can damage wall insulation and increase the potential for moisture problems and indoor air quality concerns

Ice Dam Prevention & Repair

- Schedule a home energy assessment to evaluate the building envelope and identify air sealing and insulation opportunities in order to alleviate the underlying problems of ice dams, rather than simply addressing the symptoms.
- Remove leaves and other debris from gutters in preparation for winter snowfall and to prevent ice build-up.
- Reduce the temperature of the roof by reducing the ambient temperature in the attic. The roof must be as close as possible to the exterior temperature and areas of differential temperature should be reduced to mitigate the formation of ice dams. This can be accomplished by several methods, including:
    - Sealing air leaks effectively in the attic to prevent heated interior air from leaking into the attic space and warming the roof deck
    - Adding insulation in the attic floor to prevent radiant heat transfer from the home's interior
    - Removing heat sources, like ductwork or hot water piping, from the attic space or, if this is not feasible, insulating them sufficiently.



- Provide a waterproof membrane above where the water will accumulate on the roof. The width of this membrane is affected by the roof pitch; steeper roofs will require a narrower membrane.
- Do not get on your roof or chip away at the ice from the ground if an ice dam does form. Both of these methods are dangerous and could cause damage to your roof.

Leveraging Energy Efficiency Programs

- The Mass Save® Home Energy Assessment is a home visit that helps identify cost-effective energy improvement or replacement opportunities in your home.
- As part of this program, eligible homeowners can receive incentives of 75 percent (up to $2,000) of the cost of approved insulation improvements, as well as no-cost targeted air sealing.
- Visit the Mass Save website at www.MassSave.com for more information.

Speak with a building professional about possibly ventilating the attic to remove built-up heat, if your building still has ice dams after following the steps above. This should only be attempted as a last resort, and may not be an appropriate solution in every building.