

Heating cables may not be the answer to ice damming

by Jack Robinson, RRC

Q: Last winter, we experienced a buildup of ice and snow at our roof's gutters. The local hardware store manager recommended that, this winter, we install a heating cable on the roof just above the gutter to melt the snow and prevent ice buildup. Is this a good idea?



A: In 1989, Jonathon Paine, president of Snow Country Consultants Ltd., Whistler, British Columbia, Canada, wrote in *Building Design for Heavy Snow Areas*, "... roof [systems] should not have to depend on an energy supply to work properly." In general, the author agrees with this statement.

The condition that's described commonly is referred to as ice damming. It is caused when the snow cover on a roof system is warmed from underneath (where the roof covers the heated portion of the building) and flows downslope only to refreeze when it reaches the outer, unheated area. This "dam" can prevent subsequent melted ice from flowing downslope, resulting in a backup under the shingles that can cause leaks. Roofs with lower slopes are more susceptible to water backup under the shingles than those with more severe pitches.

An effective way to prevent ice damming is to properly ventilate the attic area and install additional insulation on the attic floor. Increasing the ventilation and insulation will cause the attic area to be colder (closer to the ambient temperature). This way, the snow cover on the roof system is less likely to melt and refreeze.

To prevent leaks on roof systems where ice damming cannot be

eliminated completely, NRCA recommends the installation of ice-dam protection in cold climates (see "Guidelines for ice-dam protection," September issue, page 61). Essentially, this is a waterproof membrane installed below the watershedding shingles. NRCA recommends that ice-dam protection be installed from the downslope edge (eave) to a point upslope that is 24 inches (610 mm) past the interior side of the exterior wall.

In severe climates, or when the roof is not steeply sloped (e.g., at least 4-in-12 [33 percent]), one might consider extending the ice-dam protection further upslope (e.g., 36 inches [914 mm] past the interior side of the exterior wall). Incidentally, it is relatively easy and inexpensive to install the protective membrane when the roof system first is installed because the membrane is attached under the primary roof covering (i.e., the shingles, shakes or tiles). It is more difficult and labor-intensive to attempt to retrofit ice-dam protection on an existing roof system.

Electric heating cables cannot take the place of roof systems that are designed, sloped and installed properly. Electric heating cables rarely prevent ice dams from forming, though they can melt small tunnels through the ice and prevent further water from ponding upslope from the dam.

Electric heating cables also have some drawbacks that should be considered before they are installed. The first thing a roofing professional should keep in mind is safe operation. Only heating cables that bear Underwriters Laboratories' (or another similar testing laboratory's) labels should be used. Additionally, the cables should be installed by a professional who is knowledgeable in roofing and electrical connections. The cable should be equipped with a device that automatically turns off the current at a predetermined temperature; this will save electricity and prevent shingles or other roofing materials from overheating. Also,

the heating cable should be designed properly to prevent any possibility of electrical shock.

The manner in which the cable is installed also is critical. Cables requiring exposed fasteners that penetrate into roof coverings can cause leaks, especially when they are installed where the roof is most likely to have standing ice and snow. Cables that rely on adhesives to hold them in place are vulnerable to being dislodged and could be hazardous.

In addition, the cables' placement on the roof system should be taken into account. Cables installed above gutters can melt snow and ice that may refreeze quickly and dam up when the melted ice reaches the cold gutter. Repeated cycles of melting and refreezing can cause the formation of large, dangerous icicles on the gutter's outer lip. Additionally, placing the cables in the roof system's valleys occasionally has been found to melt the snow there, only to have it refreeze at the valleys' sides. This creates ice dams in areas where they typically would not be encountered. Finally, cables might pose a tripping hazard to a worker performing repair or maintenance.

Before installing electric heating cables, some consideration should be given to operation cost. A cable's wattage should be listed on its package and can be used to estimate the total kilowatt hours (kwh) needed to operate the device. A home owner should multiply the kwh by his electrical rate (\$/kwh) to obtain an estimate of the cost to operate the heating cables. Performing this simple estimate may cause one to reconsider the benefits gained from the installation. **[PR]**

Each month in this column, NRCA technical services staff members will answer readers' technical questions. If you have a question, send it to Professional Roofing, 10255 W. Higgins Road, Suite 600, Rosemont, Ill. 60018-5607; or fax (847) 299-1183.