or equal to the minimum roof snow load, p_m. Hence, if such a hip and gable roof has a slope which requires unbalanced loading, the minimum snow load would not control and need not be checked for the roof.

C7.4 SLOPED ROOF SNOW LOADS, p_s

Snow loads decrease as the slopes of roofs increase. Generally, less snow accumulates on a sloped roof because of wind action. Also, such roofs may shed some of the snow that accumulates on them by sliding and improved drainage of meltwater. The ability of a sloped roof to shed snow load by sliding is related to the absence of obstructions not only on the roof but also below it, the temperature of the roof, and the slipperiness of its surface. It is difficult to define "slippery" in quantitative terms. For that reason a list of roof surfaces that qualify as slippery and others that do not, are presented in the standard. Most common roof surfaces are on that list. The slipperiness of other surfaces is best determined by comparisons with those surfaces. Some tile roofs contain built-in protrusions or have a rough surface that prevents snow from sliding. However, snow will slide off other smooth-surfaced tile roofs. When a surface may or may not be slippery, the implications of treating it either as a slippery or nonslippery surface should be determined. Because valleys obstruct sliding on slippery surfaced roofs, the dashed lines in Figs. 7-2a, b, and c should not be used in such roof areas.

Discontinuous heating of a building may reduce the ability of a sloped roof to shed snow by sliding, because meltwater created during heated periods may refreeze on the roof's surface during periods when the building is not heated, thereby "locking" the snow to the roof.

All these factors are considered in the slope reduction factors presented in Fig. 7-2 and are supported by Taylor (1983 and 1985), Sack et al. 1987, and Sack (1988). The thermal resistance requirements have been added to the "unobstructed slippery surfaces" curve in Fig. 7-2a to prevent its use for roofs on which ice dams often form because ice dams prevent snow from sliding. Mathematically the information in Fig. 7-2 can be represented as follows:

1. Warm Roofs (C_t = 1.0 or less):
   (a) Unobstructed slippery surfaces with $R \geq 30$ ft^2 h °F/Btu (5.3 °C m^2/W) if unventilated and $R \geq 20$ ft^2 h °F/Btu (3.5 °C m^2/W) if ventilated:
   0°–5° slope $C_s = 1.0$
   5°–70° slope $C_s = 1.0 - (\text{slope} - 5°)/65°$
   >70° slope $C_s = 0$
   (b) All other surfaces:
   0°–30° slope $C_s = 1.0$
   30°–70° slope $C_s = 1.0 - (\text{slope} - 30°)/40°$
   >70° slope $C_s = 0$
2. Cold Roofs with C_t = 1.1
   (a) Unobstructed slippery surfaces:
   0°–10° slope $C_s = 1.0$
   10°–70° slope $C_s = 1.0 - (\text{slope} - 10°)/60°$
   >70° slope $C_s = 0$
   (b) All other surfaces:
   0°–37.5° slope $C_s = 1.0$
   37.5°–70° slope $C_s = 1.0 - (\text{slope} - 37.5°)/32.5°$
   >70° slope $C_s = 0$
3. Cold Roofs (C_t = 1.2):
   (a) Unobstructed slippery surfaces:
   0°–15° slope $C_s = 1.0$
   15°–70° slope $C_s = 1.0 - (\text{slope} - 15°)/55°$
   >70° slope $C_s = 0$
   (b) All other surfaces:
   0°–45° slope $C_s = 1.0$
   45°–70° slope $C_s = 1.0 - (\text{slope} - 45°)/25°$
   >70° slope $C_s = 0$

If the ground (or another roof of less slope) exists near the eave of a sloped roof, snow may not be able to slide completely off the sloped roof. This may result in the elimination of snow loads on upper portions of the roof and their concentration on lower portions. Steep A-frame roofs that nearly reach the ground are subject to such conditions. Lateral as well as vertical loads induced by such snow should be considered for such roofs.

C7.4.3 Roof Slope Factor for Curved Roofs

These provisions were changed from those in the 1993 edition of this standard to cause the load to diminish along the roof as the slope increases.

C7.4.4 Roof Slope Factor for Multiple Folded Plate, Sawtooth, and Barrel Vault Roofs

Because these types of roofs collect extra snow in their valleys by wind drifting and snow creep and sliding, no reduction in snow load should be applied because of slope.

C7.4.5 Ice Dams and Icicles Along Eaves

The intent is to consider heavy loads from ice that forms along eaves only for structures where such loads are likely to form. It is also not considered necessary to analyze the entire structure for such