

ROOF PITCH AND ICE DAMS: PART 1

How Roof Pitch (Roof Slope) Affects the Impact of Ice Dams on Standard Residential Construction

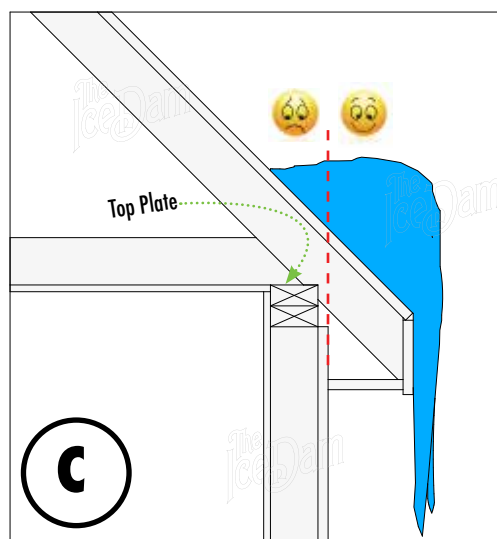
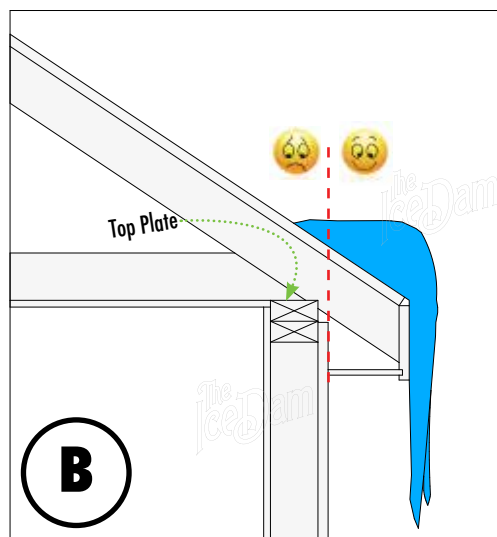
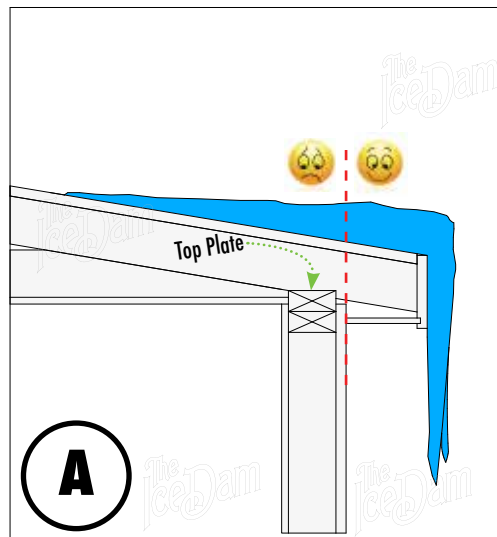
FACT: THE FLATTER THE ROOF, THE LESS ICE IT TAKES TO CAUSE PROBLEMS

As discussed in previous Ice Dam Company blogs and Case Studies, there is a strong relationship between roof slope and the timing and likelihood of damage as the result of ice dams. Specifically, low roof slope areas are far more susceptible to damage by small ice accumulations than areas of steeper slope. Why? It comes down to basic geometry. Study the diagrams, left. You can see that high slope roofs (C) require a pretty thick ice dam to form before water will begin leaking into the home. Eave depth plays another important role. See Case Study #10 for more information.

Ice dams create leaks when melt water from higher on the roof slope hits a dam of ice and is forced to travel backwards, up and under the plies of the roofing system (typically asphalt shingles). When that backward motion occurs outside the plane of the exterior wall (dotted red lines in diagrams), the water runs down the exterior wall or through the soffits (zone indicated by happy face). As soon as the water falls on top of the top plate of the wall it seeps down through the wall causing damage to insulation, finishes and flooring (zone indicated by sad face). Truthfully, water coming through your soffits is nothing to be happy about. The next stop is the interior of your home so it is considered an emergency in terms of the progression of the ice dam. As mentioned before, if you see ice coming through the soffit or down the exterior wall, it's time to get that ice dam removed.

WAYZATA RESIDENCE WITH LOW PITCH ROOF SUFFERS THE CONSEQUENCES

Seen below is a home in Wayzata, Minnesota where we steamed an ice dam a couple of years ago. The construction assembly was typical 2x6 walls, 12" eaves, 6" fascia with a 3/12 roof pitch. From the ground, no ominous, threatening icicles could be seen, just a couple of pathetic whiskers of ice off the face of the gutter and through the soffit (D). Pan out and you see that the entire exterior wall was bleeding ice through the siding. This is bad. This home had massive damage to the interior insulation, drywall and flooring systems. Three take-aways: 1) No icicles does not mean no ice dams, 2) Low pitch roofs present higher risks in terms of how quickly small ice dams can cause big problems, 3) Ice or water coming down the exterior wall in below freezing conditions is bad. Very,



As discussed in Ice Dam Company Case Study #06, low pitch roofs also tend to create 'deeper' ice dams (E), where the ice has grown further up the roof. Deep ice dams take far longer to remove.