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BULLETIN

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Roof Drainage

Most roofing experts agree that commercial roofs work better and last longer when they are sloped to provide drainage to the roof. This technical fact can be verified by checking various roofing contractor association technical manuals, manufacturer's specifications, and architectural literature. The advantages and reasons why roofs should be designed to drain rather than pond, include the following:

1. Water which ponds following heavy rains may lead to excessive roof loads, which can result in roof collapse. Catastrophic roof collapses can result in property destruction and injury or death to building occupants.
2. The probability of water infiltration into the roof membrane increases dramatically if water is allowed to pond on the roof. Water infiltration may occur through fishmouths, splits, cracks, poor welds, etc.
3. Historically, roofs exposed to the constant cycles of ponding and evaporation degrades at a quicker rate than roofs which provide free drainage.
4. Ponded water that enters the roofing membrane results in trapped moisture beneath the membrane layer. When heated rapidly by the sun, the resulting vapour pressure can result in roof membrane blisters.
 - a) Entrapped moisture may delaminate membrane laps due to freeze/thaw cycle.
 - b) Entrapped moisture reduces the thermal values of roof insulation.
5. Ice on ponds/puddles can loosen roof aggregate due to the physical action of the ice formation on the roof. Floating ice on a pond can also loosen aggregate/granules as the ice is blown around by wind.
6. Ponding water promotes the growth of vegetation on some membranes. Once these unintentional roof gardens flourish, plant roots and insects may affect the membrane waterproofness and durability, and objectionable odours may result.
7. Temperature differences between the ponded and the dry roof areas can cause a warping pattern of surface elongation and contraction that can wrinkle the roof membrane.
8. Lateral migration of entrapped moisture from hot to cold areas within the roof assembly can promote condensation, increasing areas of wet insulation.
9. Water often ponds near flashings, which may result in water rising above flashing waterproofing areas resulting in large roof leaks.

IKO Industries recommends that all roofs be provided with drainage. There are many definitions for drainage in the industry, and IKO uses the definition as outlined in the Canadian Roofing Contractors Association and the National Roofing Contractors Association minimum requirements. Specifically, a roof slope must be a minimum of 1:50 such that there will be no excessive accumulation of water that remains on a roof forty-eight (48) to seventy-two (72) hours under conditions conducive to drying. Ponding can also result from other water sources including improperly plumbed HVAC units and condensation from steam lines. Ponding should not be confused with bird baths which are random and inconsequential amounts of water that remain on a roof after a rainfall. Bird baths are inevitable due to construction tolerances and should not be considered as defects.

*Some information based on RSI Article dated May 1998.

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