



# technical bulletin

## Asphalt Roofing Manufacturers Association

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## *Effects of Ponding Water on Low Slope Roof Systems*

Ponding water is defined as water, which remains on a roof 48 hours or longer. It may result from rain, melting snow/ice or runoff from rooftop equipment. The Asphalt Roofing Manufacturers Association is joined by many reputable organizations, such as the National Roofing Contractors Association, the Midwest Roofing Contractors Association, the American Institute of Architects, and the International Institute of Building Enclosure Consultants in recommending that roof designs provide adequate slope (usually min. ¼" per foot) to ensure that the roof drains freely throughout the life of the building, thereby lessening the potential adverse effects of ponding water.

If not addressed, ponding water may result in significant consequences including but not limited to:

- **Deflection/Deformation:** As water accumulates in ponding areas, the load on the roof increases, and may result in deck deflection. The potential for deck deflection increases with the capacity of the area to hold water thereby increasing the potential risk to the structural integrity of the deck.
- **Ice Damage:** Ice formations develop and move constantly with changes in temperature. This movement may "scrub" the roof membrane to an extent that physical damage to the membrane may occur.
- **Biological Growth:** When water stands for long periods of time, it promotes biological growth, such as algae and vegetation. Damage to the roof membrane may occur from chemical and physical attack from the bio-growth as well as the expansion and contraction of the bio-growth during wet and dry cycles. Additionally, vegetation and other debris may clog drains and cause additional ponding.
- **Dirt/Debris Accumulation:** Accumulation of dirt and debris may support biological growth. If a ponding area dries, the accumulated dirt and debris may contract during dehydration (resulting possibly in "alligator cracking") and pull at the surface of the membrane.
- **Water Infiltration:** If roof membrane integrity is compromised, the risk of water infiltration into the building and subsequent interior damage is amplified.

Best practices to avoid ponding water are as follows:

- A roof's structural frame or deck should be sloped, and drainage components such as roof drains and scuppers should be included.
- Regular maintenance to ensure drains remain unobstructed so that ponding water does not occur due to clogged drainage systems.
- If a deck does not provide the necessary slope to drain, a tapered insulation system may be used to create positive roof drainage.
- Crickets installed upslope of rooftop equipment and saddles positioned along a low-point between drains, may help minimize localized ponding in conjunction with a tapered insulation system.
- Rooftop HVAC condensate lines should be connected to proper drains to prevent condensate from draining onto the roof.

If ponding water does occur, efforts should be taken to eliminate or reduce the accumulation and persistence of water on the

roof surface. Failing to address ponding water may shorten the effective life of the roof membrane system.

To obtain specific information regarding the effects of ponding water on particular products and systems, contact the individual roofing material manufacturer.

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