

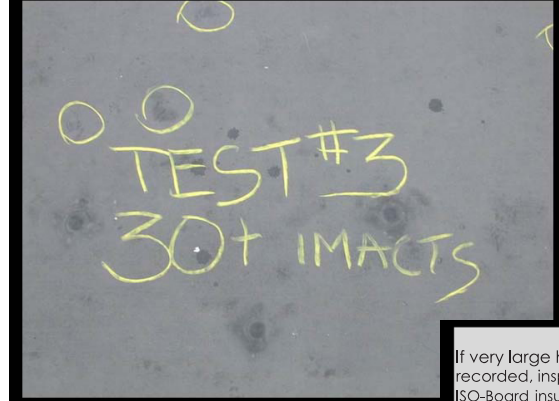
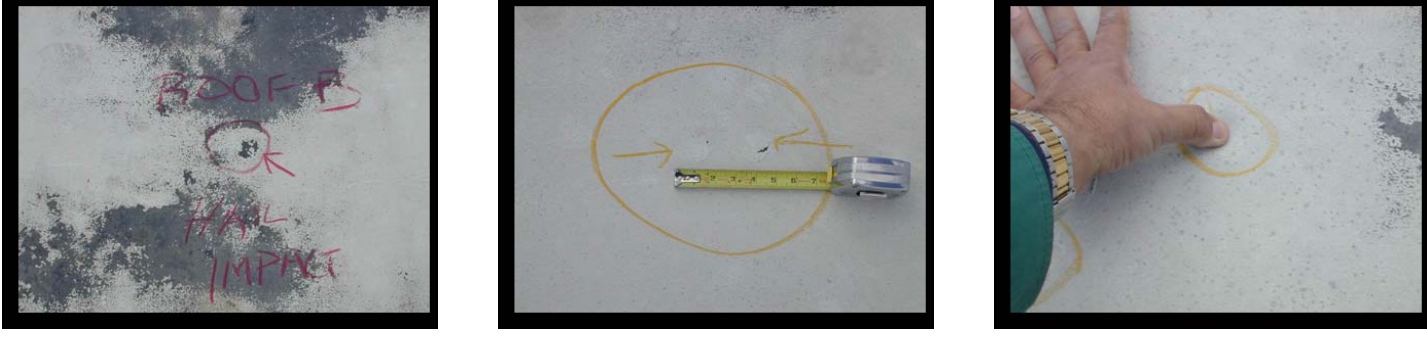
Hail Damages to Roof Systems #4 Single Ply Membrane Roof Systems

Hail is a natural destructive force that can cause severe damages to residential, commercial and industrial roof systems. Analysis and confirmation of "true" hail damages must be performed by personnel with both technical training and extensive field training expertise of the natural and physical natures of both hailstones and roof systems.

Large damaging hailstones can have devastating effects to single-ply membrane roof assemblies, sometimes without causing direct membrane damages.

Non-reinforced EPDM has great flexibility properties, while underlying insulating substrates, such as ISO-Board, have low impact ratings. This combination can result in damages to the underlying substrate without actually damaging the EPDM membrane.

If hailstones larger than 1.5" in diameter are recorded or suspected, probing of larger splash marks would be recommended to feel for underlying insulation damages.



If very large hailstones have been recorded, inspection of underlying ISO-Board insulation is recommended.



- Very large damaging hailstones can have devastating affects to single-ply membrane roof assemblies, sometimes without causing direct membrane damages.
- Non-reinforced EPDM has great flexibility properties, while underlying insulating substrates such as ISO-Board have low impact ratings. This combination can result in damages to the underlying substrate without actually damaging the EPDM membrane.
- If hailstones larger than 1.50" in diameter are recorded or suspected, probing of larger splash marks would be recommended to feel for underlying insulation damages even to HD type cover boards with higher impact rating.



Thermo-Plastic single-ply membranes, especially aged and brittle PVC systems, can be very vulnerable to impact damages.



These photos show isolated membrane fractures within multitudes of splash marks to the surface of the dirty PVC membrane.

However, mere "splash-marks", in-and-of-themselves, on a roof system's surface does not necessarily indicate surface or membrane damages.

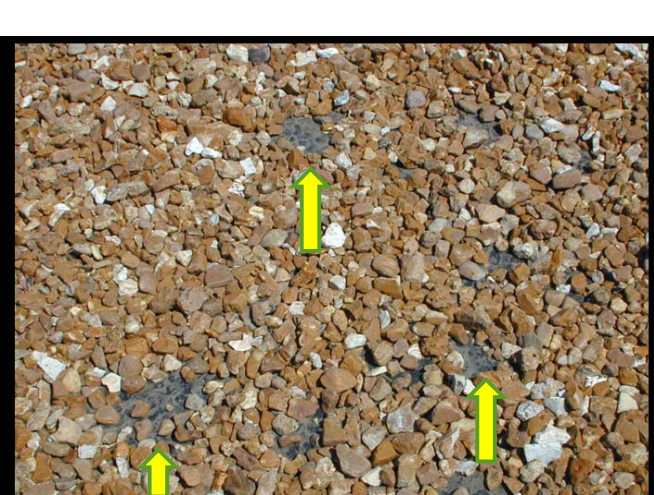
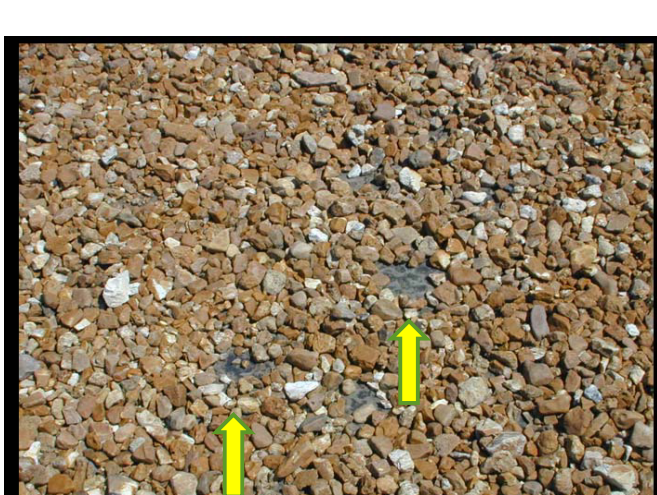
However, if large and dense hailstones of at least 1.5" or larger in diameter have been recorded, closer attention should be paid to the larger splash marks.



These photos show loose-laid ballasted EPDM systems which have been impacted by very large hail.

However, only some ballast disbursement can be detected. The 1000 lbs. to 1200 lbs. per square of heavy ballast provides exceptional resistance to hail impact damages and lessens the direct impact force of ice projectiles.

However, if large and dense hailstones of at least 1.5" or larger in diameter have been recorded, closer attention should be paid to exposed areas and membrane flashings.



"Reinforced" single-ply membranes, as shown in these photos, can be more susceptible to actual direct hail impact damages due to the lack of flexibility compared to non-reinforced membranes.

Non-reinforced EPDM has great flexibility properties while reinforced membranes have considerable less elongation characteristics. This lack of flexibility can result in damages to the actual single-ply membrane.

If hailstones larger than 1.5" in diameter are recorded or suspected, probing of larger splash marks would be recommended to feel and inspect for membrane fractures.

