



Hail Doesn't Discriminate; Damage Severe

The number of hail events spanning the last several decades has been on the rise according to the National Oceanic and Atmospheric Administration (NOAA).

While hailstorms can occur in any part of the Country, hail losses occur most often in the states of Texas and Oklahoma, with Colorado, Missouri, South Dakota, Nebraska, New Mexico, Kansas and Wyoming seeing frequent hail losses as well.

What is hail? Hailstones are composed of water layers and can vary in density and size. They typically range up to 3 inches in diameter but have been as large as 8 inches in diameter. Hailstones typically develop 3-4 miles above the earth's surface where air temperatures are -40 degrees Fahrenheit or lower. The moist vapor carried by air moving upward inside a storm condenses and ice crystals form.

According to a recent study by the Insurance Institute for Business & Home Safety (IBHS), 75% of damage from hail is to roofs, 13% to awnings, 7% to wall paint, and 5% to glass. The good news is that measures can be taken to protect against hail. Ideally the measures should be implemented during new construction but existing construction can also be protected. Recommendations are for churches within Hail Risk Zones, but can be applicable to all churches.

Insurance Board's largest hail claim was in 2016 and cost more than \$3M.

In 2018 hail claims represented 7.46% of filed claims, but costs for those claims represented 14.21% of total 2018 claims costs.

I. Existing Construction

1. For roofs, there is generally not much that can be done to improve hail resistance. However, if possible, the following can be considered:
 - Over low sloped built-up and modified bitumen roofs, apply at least a 1 inch layer of pea gravel over the existing roof surface. Prior to installing the pea gravel, a licensed structural engineer should certify that the additional dead load weight can be supported by the existing structure.
 - Over low sloped Single Ply Membrane (Rubber) roofs, apply at least a 1.75 inch layer of min ballast stones larger than 4 inches in diameter. A licensed structural engineer should certify that the additional weight can be supported by the existing structure.

- When it comes time to replace your Single Ply Membrane (Rubber) roof, recover the roof with a system that includes a fully adhered SPM system with the following traits:
 - a. Thicker membrane is better
 - b. Fleece back SPMs are preferred over smooth SPMs
 - c. Heavier fleece is better
 - d. A cover board is ALWAYS needed below the SPM and over the insulation layer
 - e. ½ inch HD polyisocyanurate cover board is preferred as it performs better than ¾ inch gypsum
 - f. The cover board should not have any fasteners on the top surface
- 2. Rooftop equipment should be properly constructed and protected. If constructed of lighter gauge metal or aluminum, they will be susceptible to hail damage.
- HVAC Cooling fins should be protected with steel wire mesh with a maximum opening of 1 inch and supported on a steel frame. The mesh should be at least 1 inch away from the fins.
- Fiber reinforced plastic (FRP) and glass

panels, skylights, and domes on the roof should also be protected with a mesh as described above.

- Provide hail screens or guards as described earlier.
3. Verify that the roof skylights are rated for large hail impact resistance that is appropriate for your area of the Country. If existing skylights do not meet this requirement, they can also be protected as described above. Alternatively, skylights can be removed or replaced.
 4. In hail prone regions or where there is risk of ponding from blocked drainage, roof drains will be susceptible to blockage. Drain guards should be provided.

II. NEW CONSTRUCTION

1. The roof hail rating should meet American Society for Testing and Materials (ASTM), Factory Mutual (FM), and Underwriters Laboratories (UL) for the appropriate rating for the location of the facility.
2. Roofs in more hail prone regions mentioned at the beginning of this article should meet the Very Severe Hail (VSH) standard. At this time, since there are limited approved roofs systems that meet this standard, it is recommended to not install Single Ply Membranes. Acceptable alternative roofs for this region are:
 - Traditional built-up roofs with gravel or stone.
 - If a Single Ply Membrane system

must be installed, please see a.-e. on page 1. Same applies here.

3. Rooftop equipment should be protected as described previously for Rooftop/Outdoor Equipment.
4. Exterior Finish Systems (EIFS) construction: Construction in hail prone regions should meet Florida Product or Dade County Approved large missile impact resistance standard.
5. Solar PV Panels:
 - For rigid panels, use resistant panels rated for Very Severe Hail.
 - For flexible panels, use Severe Hail resistant panels.

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