

Identifying Deliberate “Hail” and “Wind” Damage to Shingle Roofs

By Lyle D. Hogan, RRC, FRCI, PE

This article deals with the darker side of humanity. On occasion, roof damage is purposefully inflicted in an attempt to simulate compromise by wind and hailstorm activity and in an effort to carry out insurance fraud. The author has reviewed such instances for over 30 years, and there is always supporting evidence that signals fraudulent activity. The practicing roofing expert should be aware of these examples.

MANUFACTURED HAIL DAMAGE

Exposure to damaging hail generally results in pockmarks, bruising, chipped shingle edges, and breakage of unsupported zones such as rake-line overhangs. Crushing of mineral granules from deliberate blunt force impact is not hail-related influence. Tools and techniques of every form imaginable have been used in an attempt to sim-

ulate natural hail impacts (Figures 1-4). Ice particles, regardless of size, will not pulverize mineral granules (Figure 3). Where surfacing material has been reduced to powder, there is something else at work.

Figure 5 depicts a case in which the owner spent considerable effort simulating a fairly random pattern of impacts. The problem in this instance was the tool used—the small (angular) end of a ball-peen hammer. These strikes (although uniformly created) were small, yet they pulverized the surfacing granules, punctured two plies of shin-

gles and felt, and extended even into the wood decking.

Fortunately, damaging hail almost always generates peripheral damage. Consequently, nearby greenhouses, gutters, downspouts, soft-copper valley liners, chimney flashing, and light-gauge attic vents should provide insight into the actual storm intensity. Significant hail will also leave a signature on older wood, plastics, and exposed paint. Oxidized paint on roadside utility boxes (Figure 7) is a wonderful witness to hailstorm particle size and intensity. Similarly, well pump covers, HVAC condenser fins, window screens, hot-tub



Figure 1 – Deliberate puncture from round mandrel of some type.

Figure 2 – Unnatural radial pattern from deliberate impacts. This type of pattern can be inflicted by anything from a rake handle to a golf ball in a sock.



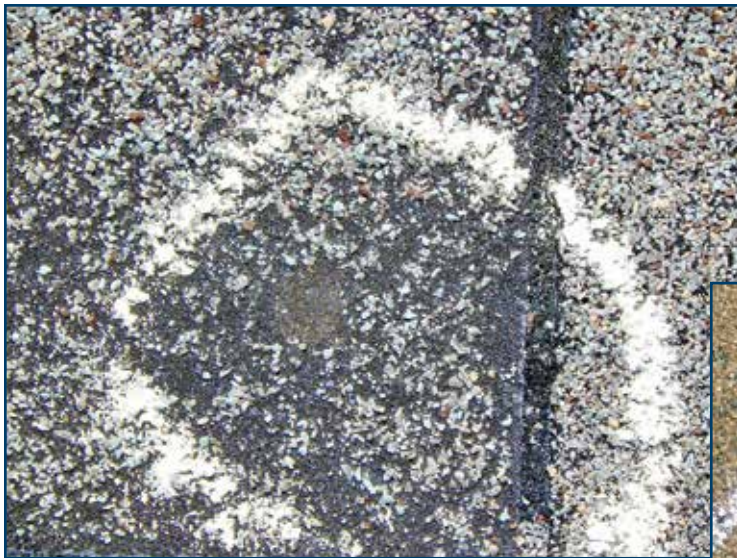


Figure 3 – Another technique to simulate hail pockmarks is known as “dime-spinning,” although other denominations work just as well. Peripheral observations will support or negate the intensity of whatever hail was actually sustained.

Figure 4 – Crushing of mineral granules from deliberate blunt-force impact. Hail particles, regardless of size, will not pulverize granules, reducing them to powder.



covers, and the like can serve to refute or validate the nature of storm intensity being claimed. Large-leaf vegetation, (e.g., Caladia and Colocasia plants, banana trees, and even tobacco fields) is a reliable silent onlooker of recent hailstorm activity. Claiming wholesale roof destruction when fragile nearby plantings are unaffected does not square with the facts. It may also not align with the readily available hail report services.

Small ice particles have little kinetic energy; and on roofs in reasonably functional condition, such hail does not reduce service life. But a small increase in size causes exponential increase in falling energy. Remembering the formula for volume of a sphere ($4/3\pi r^3$), volume varies as the cube of radius. Large hail can inflict damage but just as well may not, depending on particle hardness, roof condition, and even prevailing temperature at the time of exposure.



Figure 5 – The small end of a ball-peen hammer was used on this one. Impacts extended through two plies of shingles, underlayment, and into decking. Hail particles of this small size would have no such kinetic energy. Again, the granule surfacing was powdered; also note the linear pattern of swing lines. Large Caladiums and Colocasia plants (elephant ears) directly below this roof were completely unaffected.

So much good literature has been published about this aspect that it will not be explored further here. The point is to recognize what is not hail-related; legitimate damage to a roof should be reconciled by peripheral observations.

MANUFACTURED WIND DAMAGE

Manufactured wind damage is the ugly stepsister of fraudulent hail damage. Ordinary wind damage will involve torn, creased, or folded tabs or even loss of entire courses. Linear creasing at the top of tab exposure

Figure 6 – Innocent, natural, random pattern of legitimate hailstone pockmarks. These are greying-out from UV exposure in contrast with more recent hits that would be darker.





Figure 7 – A little detective work will prove worthwhile. Here, the oxidized paint of a roadside utility box provides good evidence regarding particle size (all smaller than a penny). Markings on a roof that deviate appreciably from this should be regarded with suspicion.

Figure 8 – The author witnessed this pattern made by a well-meaning contractor who was determining the nailing pattern; nonetheless, this is not a natural pattern of creasing due to high winds. Tabs were very well bonded here. When some damage is encountered but remaining shingles are very well bonded, the basis for concern is present.



(Figure 10) represents legitimate compromise to a shingle roof; folding and creasing elsewhere on the tab exposure is a dubious occurrence. A casual Internet search will reveal the common manner of wind influence on shingles.

Most self-sealing shingles will develop considerable bond when an adequate amount of bituminous adhesive is present. However, some “utility-grade” products do not have much adhesive, and optimum bond may never be achieved. Poorly bonded tabs are susceptible to wind damage, and little effort is required to separate tabs. This becomes a judgment call. But when some damage is encountered and remaining shingles nearby are well bonded, the basis for concern is present. Shingles recently creased by “artificial” forces will likely have loose granules residing still in the creases. Additionally, remember that the windward and leeward slopes of a pitched roof behave differently during wind exposure. With straight-line winds, radical damage on

a leeward side may collapse under the weight of rational analysis; moreover, shingles torn away in irregular lines—especially with the torn fractions still nearby—are inconsistent with windstorm activity (Figure 11). The person of dubious character who carries out his own wind damage should always throw the torn fractions to the ground [Memo to the crook: If you are going to rip off the tabs, don’t leave them on the roof].

Once again, high winds virtually always generate peripheral damage. Awnings, canopies, and very

light shelters (sometimes only staked into the ground) provide very good corroborating evidence for what did or did not happen. Nearby roofs with similar materials, exposure, and orientation may also provide



Figure 10 – Natural linear folding/creasing that constitutes legitimate roof damage. Note also the “graying-out” of the crease, suggesting this tab has been flexing in the wind for some time.


Figure 9 – Unnatural tear pattern from deliberate destruction.

Figure 11 – Highly irregular tear lines are inconsistent with ordinary wind influence. More importantly, winds sufficient to inflict this extent of damage would not have left the loose fractions still scattered about the roof surface; this “practitioner” needs a course in remedial reasoning.



excellent corroborating evidence. Bradford pear trees may be particularly helpful; mature trees often lose large branches during even moderate winds. If there is no recent breakage, the claim for high-wind exposure becomes suspect.

Overtured flowers in a nearby cemetery, loss of glazing and shutters, dislodged gutters and downspouts, destruction of the signage or storefront overhangs, and related occurrences will support the argument for windstorm exposure; however, a lack of disturbance to delicate bird feeders, wind chimes, nameplates on the mailbox, certain forms of playground equipment, poolside furniture, and the like will refute it just as easily. This detective work will prove worthwhile every time.

Finally, in communicating findings with the skeptical, unconvinced, or fraudulent individual, rationalizing with the facts may or may not prevail. Remember, though, that theories must be made to fit the facts—not facts to fit the theory. All sorts of things are possible, but not all possible things are equally probable. 

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