2022 Focus November Conference
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**Put Your Roofing Skills to the Test**

## I. Purpose and Introduction to Roof Covering Damage and Assessment

### Why a Hands-On Defect and Damage Class?

Seeing, feeling, and touching something at the point of failure is different than reading about it. As humans, we process information differently when we are immersed in learning. Getting our hands dirty – with roof coverings – that's how this course begins. As an **interactive** course, with a **scripted approach** to attendees compare and physically simulate manufactured damage, provides a different view of roof covering defects and/or damage. The live demonstrative includes discussion and accompanies the course while providing a visual representation of damage to roof coverings, as well as the interplay of roof covering damage in insurance claims and litigated matters. The attendees see, feel, and participate in the effects of the creation and observation of damage which are generally only reported by their expert; however, in this scenario, the sense of seeing and touching are added for educational purposes. In participating in the course, the attendees can then use their firsthand knowledge of roof covering damage and develop their own non-technical descriptors to verbally convey similar damage in mediation, arbitration, or to a jury during trial.

Throughout the course, the technical focus of this presentation relates to allegations of damage and/or defects from pre-litigation matters to those that are in all stages of litigation. Best practices provide claims professionals and attorneys in attendance with knowledge of knowing when to retain an attorney, when to retain an expert, what expectations there should be from their expert, how experts develop their opinions, and presenting their opinions in writing, among others.

**Insurance and Roof Covering Damage**

Insurance carriers that underwrite roof covering coverage must take notice of the risks associated with storm-created damage, mechanical damage, defects, and intentional mechanical damage. Insurance policies will often state what damage is or is not included. Such damage that is often excluded is cosmetic hail and wind damage. Cosmetic damage is often defined as damage that does not reduce the water-shedding ability of the roof system. An example of cosmetic damage is Hailstone impacts which result in indentations to the metal panel roof system absent of ruptured metal or disengaged laps/fasteners. Therefore, if a policy decision is being made on if the damage is cosmetic or not then the person who is performing the inspection must have the necessary inspection experience to determine the correct results. Material and installation defects are often excluded or have limitations on coverage.

## II. Types of Laboratory Testing and the Benefits of Each

**Desaturation Test**

Shingle desaturation testing is used to determine whether damage, fractures, punctures, or tears to a roofing system and roofing reinforcement material exist, which are commonly seen from impact damage, like hail. Desaturation tests can also help distinguish between a construction or material defect and external damage. Insurance companies, property owners, and legal professionals may use the results of desaturation testing to understand the extent of damage to a roof. Desaturation is the process of removing the bitumen roofing material, which allows the roof reinforcement to be fully examined. In a desaturation test, experts carefully examine and document bituminous roofing samples, such as built-up roofing, polymer-modified roofing, and shingles. Then use a vapor degreaser to desaturate the samples and remove the asphalt, aggregate, and tar from bituminous roofing, revealing the encapsulated reinforcement fibers and allowing for close examination. Any bituminous products can be candidates for desaturation testing including shingles, roll roofing, or underlayment, which allows experts to be able to analyze the mat and determine the cause of the claimed damage to the roofing system.

Following the desaturation process, experts note whether the reinforcement material contains fractures, punctures, or stained regions that are characteristic of impact damage. The expert will then provide a comparative analysis using overlays of original samples and completes a detailed report including descriptions, findings, and photographs. ASTM D2829, Standard Practice For Sampling And Analysis of Existing Built-Up Roof Systems, is the guide for removing test specimens from existing built-up roofing systems in the field and for determining the approximate quantities of the components of that specimen.

**Ice Ball Impact**

Impact-resistant roofing materials are currently rated according to the standard test methods UL 2218 or FM 4473. Impact-resistant shingles have passed one of two standardized tests: UL 2218, “Impact Resistance of Prepared Roof Covering Materials,” which uses steel balls, or FM 4473, “Specification Test Standard for Impact Resistance Testing of Rigid Roofing Materials by Impacting with Freezer Ice Balls,” which uses pure water ice balls. For UL 2218, a steel ball bearing is dropped onto a roofing test panel from a height necessary to replicate the theoretical kinetic energy that spherical hailstones of similar diameter would have. UL 2218 will assign an

impact rating (1 through 4) to roofing covering based on its residence to different impact loading. The impact loading ranges from a Class 1, which simulates a 1-1/4-inch steel ball with a kinetic energy of 3.53 ft-lbs. up to a Class 4 with simulates a 2-inch steel ball with a kinetic energy of 23.71 ft-lbs. For FM 4473, a pure water ice ball free of cracks and air bubbles is launched perpendicularly at a roofing test panel at a speed necessary to develop the intended kinetic energy.

The Insurance Institute for Business & Home Safety (IBHS) Impact Resistance Test Protocol for Asphalt Shingles uses a hail cannon to launch 1.5- and 2-inch manufactured hailstones at roofing test panels. After the impact from the hail cannon the shingles are inspected for an acceptable level of damage. In addition, roofing samples can be sent to a lab where comparative ice balls are launched at the sample to determine if the damage observed on site is consistent with hailstone impacts.

**Single-ply analysis using a High-Intensity Backlight**

Single-ply analysis using a high-intensity backlight is a tactile test method for examining rubber and plastic-type roof membranes, such as thermoplastic polyolefin (TPO), polyvinylchloride (PVC), and ethylene propylene diene monomer (EPDM). For fractures not visible to the unaided eye. Single-ply roofing samples are examined under magnification and backlighted by high-intensity light to identify characteristics of potential impacts and corresponding fractures to the membrane. Experts examine the front and back sides of the samples visually, tactilely, and using a high-intensity light source to help locate fractures, strains, or other notable conditions. This analysis can help distinguish a material defect such as uneven coverage of the bitumen material.

**Water Column Testing**

Water column testing helps us determine the response and resistance of a particular material to water intrusion. Water column testing helps reveal the presence of leaks due to fractures or holes in the membrane. There are different standards for different materials. But all of these test methods are each a standard procedure for determining water leakage through a roofing system such as a metal roof panel system side seams, end laps, and roof plane penetrations when the roof system is subjected to a specified static water pressure head. It should be noted that water column testing does not evaluate the roofing systems' resistance to wind-driven rain.

ASTM D7281, Standard Test Method for Determining Water Migration Resistance Through Roof Membranes is the test method that covers the determination of water migration resistance of roof membranes including built-up roof membranes, modified bitumen, and single-ply roof membranes. The procedures were developed to determine the potential for leakage of water through the roof membranes resulting from a standing head of water and when pressurized with air from the underside.

ASTM-E2140, Standard Test Method for Water Penetration of Metal Roof Panel Systems by Static Water Pressure Head is the laboratory test method that covers the determination of the resistance to water penetration of exterior metal roof panel system side seams, end laps, and roof plane penetrations when a specified static water pressure head is applied to the outside face of the roof panel.

**III. Hands-on Evaluation**

**Live Demonstration**

As previously discussed, one of the best ways to learn about the differences between naturally occurring hail and/or wind damage vs. manufactured damage, material defects, and/or mechanical damage is to physically inspect examples of each. During the presentation, attendees will be given the opportunity to try and trick each other by trying to recreate manufactured hail damage with items such as hammers, quarters, and the heel of a foot. This demonstration will showcase the different appearances of the roofing coverings after each type of damage is induced. In addition, desaturation examples from Envisat's laboratory will be showcased for attendees to visualize what happens to the reinforcing mesh inside an asphalt shingle.

**IV. Defects, the Law, and the Interplay Roofing Damage**

**Legal Definitions**

Legal definitions with roof covering defects are critical to the understanding of the subject matter. In general, "patent" defects are those that are visible and/or obvious, while "latent" defects are those that are hidden and/or concealed. Individual states provide definitions for both patent and latent.

The California Code of Civil Procedure, § 337.1(e) defines a patent defect as "*a deficiency which is apparent by reasonable inspection*." There is an interplay of "negligence" with insurance policies that may impact coverages and/or exclusions. The difference between patent and latent is summarized well by a Cornell Law School brief with references to cases included: "*In further analyzing whether a defect is patent, courts may consider whether an objective person would discover the defect. For example, in Delon Hampton & Associates, Chartered, v. Superior Court, a California court described the California test for whether construction defects are patent as "whether the average consumer, during the course of a reasonable inspection, would discover the defect. There, the court found that a stairwell that was too narrow with a banister which was too low was a patent defect. California case law has also included the following examples as patent defects: the absence of a fence around a swimming pool (Mattingly v. Anthony Industries, Inc.); raised paving stones on a patio (Tomko Woll Group Architects Inc. v. Superior Court); and defective construction of a landing that allows water to pool on the landing and to drain into an office (Sanchez v. Swinerton & Walberg Co.). By contrast, California case law found that the follow defects were not patent, and therefore latent: an improperly designed heating and air conditioning system, which causes uncontrollable temperature fluctuations (Baker v. Walker & Walker Inc.); and the absence of a vapor barrier, which caused the siding on a building to buckle (Mills v. Forestex Co.)*."

In the Florida Statute § 95.11(3)(c), latent defects "…*are generally considered to be hidden or concealed defects which are not discoverable by reasonable and customary inspection, and of which the owner has no knowledge*." Moreover, within this statute, the state bars an action "*founded on the design, planning, or construction of an improvement to real property*" if an action/lawsuit is not filed within four years of the date the latent defect "*is discovered or should*

*have been discovered with the exercise of due diligence*." Refer to Case: The Cottages at Stoney Creek Condominium Association, Inc. et al v. JDR Construction, LLC et al, No. 1D20-956, 2021 WL 2209851 (June 1, 2021) aff'd per curiam.

This interactive course depicts both patent and latent defects with the intent of showing the "gray" in whether a defect and/or damage is one or the other – as well as the subjectiveness of such assertion. Casetext.com summarizes this well: "*More often, the dispute centers on whether the manifestation is "obvious" or could be due to causes other than an actionable defect, in which case a factual issue remains*."

## V. Hindsight, Foresight, and Lessons Learned

### Is the Past a Predictor of the Future?

Laws and legal precedents regarding construction, resiliency, inspections, and laboratory testing continue to evolve. What have we learned and how do we keep up? The intent is to learn from past mistakes and adopt what was learned into decisions made going forward. Communication and education are a large part of this. Communication between the claims professionals, experts, attorneys, insureds, contractors, and subcontractors goes a long way in resolving roof issues that occur, whether caused by storm damage, typical material construction, or a defect in the material. Although more expensive, laboratory testing could be a good option in certain claims. Communication will help us determine the correct path forward.

### What Does this Mean for Underwriting, Risk Managers, Claims Professionals, Experts, and Attorneys?

How do we adapt to the "new norm" of roofing claims, from the frivolous to the earnest? Roofing claims may not be avoidable, and they surely aren't going away, but we can (and should) be better prepared. Laboratory testing and education are important on the claims side in preventing missteps.