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The Moisture Mob Roofing Show Part II: Leaks, Dry-outs, Mitigation & Scammers!

John T. "The Roof Guy" Hull John "The IEQ Guy" Lapotaire

John T. Hull has over 25 years in the roofing and coatings industries. He is a recognized authority on roof restoration and moisture detection within the roof and building envelope. Mr. Hull has provided technical support, training, and consulting in over 30 Countries. His expertise in roof restoration has contributed to roofing projects at NFL stadiums, airports, universities, hospitals, military bases and even the White house.

John Lapotaire, together with his wife Lydia, has owned and operated Orlando Florida based Indoor Air Quality Solutions since 2001. John is a Building Envelope & Indoor Environment Consultant specializing in building product failure investigations, forensic water intrusion investigations, and building envelope failure investigations for commercial and residential structures.

Nuggets mined from today's episode:

Let us review some key points from the first show and go a little deeper.

John Hull's Comments

Roof inspection

The process needs to be consistent & repeatable.

Must understand the building use.

Must understand the type of roof.

Awareness of influencing factors (cold storage, overhead cranes, thermal shock, building movement). Matching buildings may conceal differences (such as: skills of roof installation crews, materials, etc.)

Walk entire roof noting and marking visual problems.

Find known dry area. (Sometimes you cannot find a known dry area, so reverse the process and look for areas when the needle on the meter goes down) Make 2" core cut down to roof deck.

Calibrate instruments and equipment. Uses Tramex: Dec Scanner, RWS, CMEX5 (Take quantitative dry readings and adjust setting on moisture meters. Dry = 7%-15%).

Establish dry standard and then survey the roof.

Mark problem areas with paint.

Sketch and overlay Google earth.

Create accurate diagrams; notate position of drains, HVAC equipment, etc. Applicable ASTM standard is driven by type of surveying instrument.

Roof problems:

Roofs should be designed to shed water.

Roofs with high foot traffic are most prone to leaks.

Roofs with less redundancy are more prone to leaks.

Roofs undergo thermal shock and construction.

Geography is a big factor. Roofs in moderate climates along the Mason Dixon line will outlast roofs in more extreme climates.

UV light and extreme weather can affect roof lifespan.

Roof materials offer uniform quality.

Installation skill varies.

Water ponding takes a toll as does abrasive soil and biological degradation. He advocates for routine inspection and cleaning of commercial roofs.

Roof Asset Management- includes annual inspection, cleaning, replacement of sealants. A good roof surveyor needs to think like water and be a building scientist.

3 phases of a roof:

- Repair Phase during which deficiencies are fixed.
- Restoration Phase during which an encapsulant or coating is applied to extend life.
- Replacement Phase The most expensive and invasive option.

- The roof covering is what is exposed to the elements. Construction waste from roofing tear-offs is the major waste disposed of in landfills. 2/3's of roofs can be repaired and revitalized.
- A roof is like a car; proper maintenance extends service life.
- Owners often delay roof restoration until it is too late.

John Lapotaire Comments

- Moisture meters are money! Tramex RWS allows operator to preset moisture 1%-100% and depth sensitivity.
- Advocate for the 7.8" electrode in conjunction with CMEX5
- Advises that roofing tiles be cleaned with appropriate cleaning products. Does not advise cleaning asphalt shingles with chlorine or highly caustic cleaners.

Cause and Origin Roof Leak Investigations

Roof leaks are responsible for many of the nuisance odor complaints we respond to. We consult for many Central Florida Home Builders on cause and origin investigations. Often roof leaks are discounted since the roof leak does not manifest at the ceiling. Ceiling stains are easy to spot and can easily be distinguished from condensation an HVAC duct due their occurrence when it rains. Condensation is a constant.

Roof leaks at transitions between roofs and adjoining building materials such as walls and chimneys often have no visual indication of failure at the ceiling. Often there is little more than an odor. These are the roof leaks that are much more difficult to identify. Kick-out flashing, chimney saddles, crickets, dead valleys are some of the areas that are more difficult to identify. Add to that the ever-growing use of spray polyurethane foam insulation and roof leaks become a cause and origin boom for us.

Case Study #1 Flashing Transitions

The first case study is a newly constructed home with a value well over 1 million dollars. The issues with this home were multiple leaks that the roofing contractor stated were not from the roof. The leaks manifested during construction and

disappeared for a few months only to reappear once occupied. The leaks disappeared during the winter when there is very little rain. The home also has Spray Polyurethane Foam Insulation which also slowed the appearance of the leaks.

The remaining unidentified leaks were at the rear of the home. The leaks came through the tongue and grove lanai ceiling. This was reportedly an inaccessible attic space. Inaccessible until we made an access. Once in the attic space we could hunt for the origin from the attic which is the preferred method of hunting for roof leaks. Roofers prefer to hunt for leaks from the roof.

We found 3 separate areas of roof leaks all at the flashing transitions between the roof and vertical walls. The first was a corner transition that was failing, the second was a parapet wall transition that was failing, and the third was below the second-floor windows where the flashing transition between the windows and roof decking was limited and led to a creative and failed flashing transition.

Case Studies #2 - #4 Kick-Out Flashing

Case Study #2 is also a newly constructed home that is well over 1 million dollars. The home had not yet been occupied and had a reported nuisance odor in the first-floor study to the left of the front door. Our investigation found there to be no contributors to the musty odor at the first floor or the second floor. We traced the identified moisture from the first-floor study to the roof transition to the turret. This little kick-out flashing was allowing water to enter the turret that then flowed down to the first floor. "Kickout flashing, also known as diverter flashing, is a special type of flashing that diverts rainwater away from the cladding and into the gutter. When installed properly, they provide excellent protection against the penetration of water into the building envelope." – Source: nachi.org

The water was trapped within the turret wall behind the spray polyurethane foam insulation. We used moisture meter probes to identify the moisture within the walls that was unidentifiable at the surface. I cannot stress enough the need for probes when hunting for leaks. Surface moisture scanning, even with the probes will not help find leaks. The use of thermal image cameras will not identify moisture within a wall behind the SPF. You will need long probes. I will call them T-Probes and they come in 3 different sizes, 3 inches, 7.8 inches and the standard ½ inch.

Case Study #3

Also a newly constructed home that had been occupied for just shy of a year. The odors were reported in the second-floor front bedroom and then in the first-floor dining room directly below the bedroom. This home had two areas of flashing failure. The first was a the second-floor kick-out flashing to the second-floor bedroom wall. There was no indication of water intrusion beyond the reported odors. The second was a transitional flashing that failed at the garage roof to the second-floor bedroom wall just above the bedroom floor.

Again, we used our probes to check the moisture of the exterior sheathing and not the moisture content of the unaffected drywall. We found elevated moisture from the floor to the ceiling of the bedroom exterior wall. The original leak was at the second-floor kick-out flashing that caused substantial damage to the exterior sheathing. The damage to the exterior sheathing then compromised the transitional flashing at the garage roof.

Case Study #4

This is another newly constructed home with reported musty odors in the front dining room of the home just to the left of the entry. There had been thermal cameras used to identify moisture in the walls along with moisture scanning of the drywall. There was reportedly no moisture within the wall. As the odors persisted, we were called to identify the origin.

We again used our shorter T-probes. We found the exterior CMU (concrete masonry unit) block wall to be saturated. It's important to point out that the exterior CMU wall has ¾" furring strips that have a radiant perforated foil between the furring strips and the drywall. There is no way for a thermal camera to see the CMU wall through the reflective foil. Measuring the moisture content of the drywall is equally useless.

To confirm the water intrusion at the kick-out flashing that had already been caulked we removed the drywall and foil, and water tested the wall. As you can see in the pictures the wall quickly became saturated.

Case Study #5

This is a simple dead valley thrown in to make a point that a dead valley cannot be corrected with the liberal application of bull or caulk. "A dead valley is a point on a roof where two slopes meet in such a way that makes it difficult for water to run off. Water flows into the flat area but does not flow out." - Source: proroofingnw.com

The cricket if there is one, must be removed, extended and re-flashed. "A cricket or saddle is a ridge structure designed to divert water on a roof around the high side of a chimney or the transition from one roof area to another, the cricket is normally the same pitch as the rest of the roof, but not always. Smaller crickets are covered with metal flashing, and larger ones can be covered with the same material as the rest of the roof."- Source: Wikipedia

Case Study #6

This is a home that was reportedly affected by a named storm 13 months prior to our assessment. The home was reroofed by a roofing contractor that had partnered with a newly minted restoration company that needed to confirm the category of water that stained the ceilings of the home. Enter Indoor Air Quality Solutions. We interviewed the homeowners and assessed the home and all the ceiling stains. Some were from the reported roof leaks and others were from condensation at the attic HAVC ducts.

During the interview I asked if anyone in the home has been sick or has had any reaction to the roof leaks and ceiling stains. The reported that they have not been sick, nor have they had any reaction to the leaks or ceiling stains. Straight from the S500, Category 3 - Category 3 water is grossly contaminated and can, contain pathogenic, toxigenic or other harmful agents. So, Category 2 it is.

We met with the adjuster and discussed the need for some ceiling removal to correct the ducting and the removal of the exterior wall surrounding the fireplace due to the extensive water intrusion. The home was in poor condition and the maintenance was severely lacking. The roofer happened upon the home 13 months after the storm and was able to get the re-roof covered by the insurance.

The roofer and partner restorer then attempted to get substantial indoor restoration work due to Category 3 contamination. Unfortunately, the

homeowner hired us, and we talked to the adjuster about the loss. When we returned to the home for the post remediation verification, we were amazed at the fact that the home was fully packed out and there was a substantial amount of restoration that was not in our protocol. The pictures show the extent of the restoration that was based solely on the use of ATP by the restoration contractor.

In addition to that legal mess the reroof was failing because the roofer replaced the shingles and never addressed the failing flashing.

"John Lapotairisms":

- "A roof leak is more than a water spot on the ceiling."
- "Plugging the hole where the water is coming out won't solve the problem."
- "We are a saw away from access."
- "We never hesitate to open a wall."
- "Flashing goes in first, so it's never in the way."
- "What starts as an odor complaint call is often a roof leak."

Want to learn moisture surveying and roof inspection?

American Roofing Educators 169 Griffin Boulevard Unit 115, Panama City Beach, Florida 32413 (850) 803-4855 www.americanroofingeducators.com

Roofing Industry Trade Shows

- International Roofing Expo
- Western Roofing Expo
- Florida Roofing and Sheet Metal Expo
- <u>New England Roofing Contractor Association Show (NERCA)</u>
- <u>RCAT Texas Roofing Conference</u>
- <u>Midwest Roofing Contractor Association Conference (MRCA)</u>
- <u>Metalcon</u>

Restoration Industry Global Watchdog, Pete Consigli:

- Roofing has overtaken carpeting as the major waste in landfills. Some states have rules for carpet disposal, requiring it to be rolled up & placed curbside.
- In 1990's California when plumbers diversified into insurance repair it created conflicts of interest on insurance claims. It spread into other states.
- It appears roofers are going down that road in Florida and other states.
- As mentioned in the chat, leaking waterbeds were a common cause of water damage claims. In the 1980's waterbed manufacturers often had high deductibles and trouble getting coverage. Building owners and managers often forbid waterbeds in upper floor units and required increased deposits.
- Pete recounted being on call on New Year's Eve early in his career and responding to 2nd floor waterbed trauma incident event that looked like the movie set of a horror film with dark red water running down through the ductwork into family room below. The homeowner policy covered the claim.

Business opportunity for restoration contractors:

- Roofers who fail to protect property during roof removal in fair weather may encounter catastrophic damage caused by freak storms.
- Roofing contractors may have large insurance deductibles or be selfinsured.
- Roofing tar can cause costly damage when tracked onto vulnerable flooring materials, a liability issue where roofers contract with specialty cleaners.
- Malodors can trigger IEQ issues or impede closure on insurance claims.
- Odor detection and resolution skills are useful and lucrative for restorers!

IAQ Radio+ wishes to acknowledge Pete Consigli's preshow assistance with today's broadcast.

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Z-Man Signing Off

Trivia Question:

What is the main determining factor on the type of roofing you have on your home?

Answer: Climate

Answered by Lydia Lapotaire