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Here Come the Moisture Mob Enforcers: The Forensic Aspect of  
3rd Party Evaluations  
Moisture Related Issues Affecting Wood and Concrete  
Substrates and Flooring!  
Roland Vierra & Bob Blochinger

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Moisture Related Issues  
Affecting Wood and  
Concrete Substrates  
and Flooring - Part 2

Roland Vierra  
Robert Blochinger



**Roland A. Vierra** is President and CEO of FLOORING FORENSICS INC of San Jose CA. Roland has been a third-party claims consultant for more than 35 years. During that time, he has advised numerous clients on product and installation selection, evaluated performance and installation failures and been designated as an expert in many construction defect litigation actions. [www.flooringforensics.com](http://www.flooringforensics.com).

**Bob Blochinger** was raised in New York City, working in the family construction business. Bob began his career in the flooring industry in 1970, offering carpet cleaning and installations while specializing in water and fire damage restoration.

work. He expanded into the retail department store sector providing installation of floor covering sales. During the 1990's his company started to service the architectural and interior design trade with high-end floor covering product sales and installations. Bob also works as an expert witness, inspector and investigator for law firms, condominium associations and flooring manufacturers.  
Blochinger.net

In Part 1 the Enforcers discussed the use, application and meaning of the term Forensic as it pertains to 3rd party inspections before diving into each of their first 2 case studies. This week in Part 2, we picked-up where the Enforcers left off.

### **Nuggets mined from today's episode:**

#### Roland Viera- Church Gym Project, Northern CA

Solid Maple Floor, nailed directly to plywood.

Problem ½ flooring is cupping.

Background: ½ of flooring sitting on a dirt filled slab on grade. ½ of the floor on an addition cut into a hill. The flooring over the dirt filled slab was cupping.

Destructive inspection: Found that flooring fasteners had penetrated through moisture retarder membrane. Normal moisture content in northern CA is approximately 5.25%

Findings: Due to a simple mathematical error, flooring contractor miscalculated and ordered fasteners that were too long.

Status: Flooring contractor replaced floor at a cost of approximately \$100,000

#### Bob Blochinger Moisture Testing in School Tampa, FL

Problem: 30,000 sqft of VCT shrinking resulting in wavy appearance and oozing of black substance at seams.

Moisture content of concrete is 6.4%, should be 3%≤

Destructive inspection: Clear set and an Unidentified Black Substance (UBS) found on concrete. (UBS may be moisture barrier?)

Findings: acclimation issue, flooring was installed without acclimation or HVAC. Vinyl shrinks when cold.

Status: Settlement currently being negotiated.

Roland Viera, Junior College, downtown San Francisco.

Linoleum flooring. 14 floors of classrooms and corridors.

Problem: Flooring began bubbling 6-9 months after installation. Temporary repairs made by lifting linoleum, scraping off old adhesive, applying new adhesive and reinstalling. Many other building problems, e.g. roofing, electrical, etc. Multiple 3<sup>rd</sup> party experts hired who began tearing things apart. Everyone is sued.

Findings: calcium chloride tests and moisture mapping found moisture levels in concrete to be well within acceptable ranges. Comparative calcium chloride testing done over prepped and unprepped areas (ran 3 RH tests). Adhesive found to be releasing from concrete. Silicone based combination concrete cure + penetrating permanent moisture vapor mitigator was specified by architect. Problem is that most adhesives don't adhere to silicone. Sealer manufacturer claims sealer penetrates to a 1/8" in concrete. Alkali hydrolysis degraded the adhesive. Concrete was gray during installation now it is black. Within 30 seconds of lifting linoleum droplets are visible along with malodor. Highly alkaline (11-12pH) oily liquid is emanating from the concrete. Alkali will cook adhesives (same process is being used as chemical alternative to cremation).

Status: In claims like this its common to have settlement conferences in which everyone agrees to pay, settlement amounts are kept confidential.

Follow-up question:

***How to repair bubbles?***

Small bubbles- hypodermic syringe is used to inject adhesive.

Large bubbles- cut 3 sides and lift flap, scrape away old adhesive e, abrade concrete, skim coat concrete, apply new adhesive, place flap back and trim.

Larger bubbles- remove old linoleum, prep floor, install new linoleum and seal seams.

Bob Blochinger, Hotel Casino Moisture Testing Hard Rock Hotel Hollywood, FL

Job: Demonstrate methodology and conduct proactive testing before flooring installation. Multiple types of flooring will be installed into the theatre (LVT, VCT, sheet goods, carpet tiles, glued down carpet.)

- ASTM F1869 - 16a Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride prior to flooring installation.
- ASTM F2170-19 a Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes
- For pH testing Bob uses both litmus paper and a digital pH meter. He finds the meter more accurate.
- Must follow manufacturer's instructions for testing and acceptable ranges as found on product labels. Proactive testing is becoming more common in Florida due to number of flooring claims.

Findings: 34 grams of moisture was collected during first test. A combination of permanent and temporary HVAC was present depending on location.

- pH test was elevated.
- 40% moisture content was elevated.
- Foreign matter needs to be removed from substrate (drywall mud, paint overspray, and "bond breakers" i.e. sweeping compound need to be removed.
- Substrate needs to be ground or shot blasted before flooring installation. Recommends quality moisture barrier and high quality adhesives be used.

Follow-up question:

***How many days does it take you to make and inspection and what do you charge?***

Average service call takes several hours, fee range starts at \$300-\$600.

Roland Viera, Retail Showroom, 20 year old concrete slab

Background: concrete was pretested before installation and moisture levels exceeded manufacturer's specifications. Owner and General contractor decided that floor was 20 years old and there were no problems decided to disregard testing results and move forward with LVP installation.

Problem: unsightly adhesive seeping between plank joints, floors are a mess.

Findings: concrete was wet during installation. Wet concrete prevented adhesive from curing. The adhesive never solidified. The combination of excessive moisture and high alkalinity caused failure of the installation, bellows effect of adhesive oozing during foot traffic.

Additional information: The building is a conversion from warehouse to retail space. In California it's common that builders opt to save money by omitting vapor barriers under concrete slabs when building warehouses. Recommends core sampling to determine what if anything (e.g. vapor barrier, capillary break) is present under the slab.

The insitu ASTM RH test, a hole is drilled to 40% of the depth of the slab, a plastic sleeve is inserted, the sleeve is allowed to sit for 24 hours and probes are then put in place and hole resealed for 2-6 hours. Roland's sweet spot is 2 hours. During adverse conditions for extended periods the sensors are subject to creep.

Resolution: Removed old floor. Retested the concrete, found high moisture and recommended a 2 part epoxy system which is performing well after two years.

Roland Viera, Hospital LVT glued to above ground slab.

Problem: 60%-80% of the LVT is releasing from floor and developing a negative curl (i.e. center of plank is higher than the edges). Lack of adhesion allowed center of plank to rise.

Findings: Pulled several planks which came up very easily. Adhesive well bonded to the concrete slab and not bonded to the planks. Found contamination present on the planks. The contamination was a form release agent. Resolution: Manufacturer agreed to replace floor. Due to hospital activities and occupancy, only 500 square feet per night could be replaced.

Bob Blochinger- Moisture Testing in restaurant under construction

Testing: Calcium chloride was done using a TANITA instrument. Result was 34.5g with a 29.1g starting point. The Tramex concrete meter read 4.8%, elevated moisture content.

Documentation: Bob uses a building floorplan to note locations where testing was conducted.

Recommendations: Moisture remediation was recommended. Moisture barrier recommended as insurance prior to installation of seamless epoxy flooring.

#### Bob Blochinger- Powerplant Industrial Warehouse Moisture Testing

Bob conducted 13- ASTM 2170 test sites all of which were elevated. Some slabs may be 12" thick. Bob normally drills down 2.5" to where the moisture accumulates. Following the ASTM guidelines, Bob will go back and test 3 days later. It is important to document the working conditions.

Follow-up questions:

***How is moisture in concrete remediated?*** Smooth and slick concrete is unacceptable, you must remove 1/16" of skim off the concrete by either grinding or bead blasting. Then epoxy sealer is rolled or poured on. Note from Radio Joe: This question relates to new construction and installation of floor coverings.

***What about silica?*** When drilling be careful to comply with Silica Regulations, use special tools: HEPA vacuums, HILTI hollow core drill bits with vacuum attachment, dust shroud with HEPA vacuum, etc.

#### ***In the foreseeable future will meters replace the need for testing?***

Bob Blochinger: Nothing will replace ASTM testing methods in the near future. Impedance meters indicate whether a problem exists or doesn't. Bob uses several different brand meters, and prefers TRAMEX.

Roland Viera: TRAMEX is his preferred meter because TRAMEX meters provide repeatable results. When manufacturers mandate testing such as ASTM 1869 or ASTM 2659 be done you must do it. The 1869 moisture vapor emission standard is fading from view.

#### **Roundup-**

Restoration Global Watchdog; Pete Consigli

- Pete appreciates the preparation the guests put into the interviews,
- The audience likes the case studies.
- Mike McGuinness worked for OSHA enforcement; Mike commented that there is more to silica compliance than was discussed.
- Pete agrees with that silica hazards and compliance are often overlooked.

- 3<sup>rd</sup> party inspections are very important and extend beyond flooring inspectors. Water runs down, water and moisture extend into IEQ.
- Restoration technicians need training on how to properly use meter and other instruments, the danger of misuse and misinterpretation exists. False readings and misinterpretations of the data have far reaching financial implications while undermining the credibility of the industry with those they serve and the entities that bear the bulk of corrective action and remedial costs.
- The importance of proper floor preparation.
- Forensic isn't just Quincy or CSI, forensic is relating to the use of science or technology in the investigation and establishment of facts or evidence in a court of law.

### *Z-Man signing off*

Trivia question:

In real life, who was the original owner of the ship that brought fictional character Vito Andolini to the US?

Answer:

Dr. Kurt Siemers.

Answered by: Terry Sopher, Sr