National Tile and Stone Authority

NTSA Forensic Principles Series

A Deficiency Is Not Necessarily the Cause

Why Noncompliance and Causation Must Be Analyzed Separately

We have investigated tile floors that contained several documented deficiencies and only one principal failure pattern.

In one matter, removal documented limited mortar contact in sampled areas. No movement accommodation was visible at several transitions. A substrate discontinuity also ran beneath the principal line of cracking.

Each condition required analysis.

It would have been easy to identify the clearest departure from an applicable requirement and call it the cause.

The mapping did not support that shortcut.

Limited contact appeared at sampled cracked and uncracked locations. The principal cracks followed the substrate discontinuity. Other hollow-sounding areas had not cracked, and some sampled cracked locations did not show the same bond condition.

The deficiencies were real. Their relationship to the reported distress was not the same.

That distinction supports another essential forensic principle:

A deficiency is not necessarily the cause.

A Deficiency Answers One Question

Before a condition can be called deficient, the applicable benchmark must be established. It may come from the contract documents, a code, an industry standard, a manufacturer instruction, or a recognized industry practice applicable to the product, method, location, exposure, and time of installation.

A requirement drawn from a different system, material, or edition should not be treated as controlling without explaining why it applies to the work under review.

Once an applicable requirement and a departure from it have been established, one question has been answered: the work did not conform to that requirement.

That finding does not yet answer what caused the reported distress.

The deficiency may be unrelated to the condition being investigated. It may have contributed without being the sole cause. It may be the principal cause. Those conclusions are not interchangeable.

Causation Requires a Mechanism

A causation opinion should explain the physical or technical mechanism connecting the deficiency to the observed condition.

Limited mortar contact may reduce bonded area or support. Whether it explains loose tile, cracking, impact damage, or another condition depends on the failure interface, the distribution of distress, the loads involved, and the evidence preserved at the project.

Insufficient movement accommodation may leave stresses unrelieved at restrained locations. That possibility does not establish that it caused a particular crack unless the location, pattern, timing, and surrounding construction support the connection.

An improperly terminated waterproofing assembly may provide a potential water path. Water outside a shower, however, may also involve plumbing, the enclosure, penetrations, drain connections, or adjacent construction.

Naming a deficiency and a failure in adjacent sentences is not a causation analysis. The opinion must explain how one produced or materially contributed to the other.

The Pattern Must Fit the Theory

The location and distribution of distress often provide some of the most useful evidence of causation.

Where is the deficiency located?

Where is the reported distress located?

Do the two correspond?

If the same deficient condition is widespread but the distress is concentrated in one area, the expert should identify what distinguishes that area. If the distress continues through locations where the alleged deficiency is not present, the proposed explanation may be incomplete. If the pattern follows a substrate joint, transition, exposure zone, drainage path, or other construction feature, that relationship must be evaluated.

A close geographic relationship does not prove causation by itself. A poor relationship between the deficiency and the distress can still weigh against the theory.

The analysis must also remain proportional to the sampling. Conditions exposed at several locations may not establish what exists throughout an entire installation.

Performance Elsewhere Must Be Addressed

Performing areas can provide useful comparative evidence.

If the same departure exists in areas without the reported distress, that fact does not automatically prove the departure is harmless. Loads, exposure, workmanship, use, and time may differ from one area to another.

It still must be addressed.

An expert should not rely on a deficiency in the failed area while ignoring the same condition in an area that continues to perform. The comparison may show that another factor was necessary, that more than one condition may have operated together, or that the deficiency affected susceptibility rather than initiating the failure.

Comparative evidence is rarely perfect. It is often more informative than evaluating the failed area in isolation.

Timing and Sequence Matter

A proposed cause must be capable of operating before or as the reported condition developed.

That sounds obvious, but forensic investigations often occur after repairs, changes in use, repeated exposure, or the removal of critical materials. The condition observed during the inspection may not establish when it began or whether it existed before the reported event.

The expert should evaluate installation records, dated photographs, maintenance history, repair documents, weather or water events when relevant, and attributed statements from people with direct knowledge.

A reported sequence is not automatically an established sequence. Where the chronology is incomplete or disputed, the causation opinion should acknowledge that limitation.

A technically possible mechanism may remain only a possibility when the evidence does not establish that it operated at the relevant time.

Do Not Bundle Deficiencies Into One Cause

Construction projects often contain more than one deficiency.

A report may identify limited contact, improper transitions, missing accommodation, inconsistent support, and departures from manufacturer instructions. The temptation is to list them together and conclude that they collectively caused the failure.

A cumulative effect may be real, but it must be explained.

Which deficiency relates to which condition?

How could the deficiencies interact?

Does the pattern support combined action?

Which conditions are causal, contributing, incidental, or not reliably connected to the reported distress?

Counting departures does not establish causation. Each material deficiency should be evaluated for relevance rather than allowed to borrow significance from the others.

A Contributing Condition Is Not the Same as the Sole Cause

Technical causation is not always all or nothing.

One condition may initiate the distress. Another may allow it to spread, increase its severity, or reduce the assembly's ability to tolerate movement or exposure. A third may be present but unrelated.

For example, limited support may not initiate a crack that follows a substrate discontinuity, but it may affect how individual tiles respond after movement occurs. Moisture may not create an improper installation detail, but under some conditions it may contribute to deterioration at a vulnerable interface.

Those distinctions require evidence. They should not be supplied by possibility alone.

When the evidence permits, the report should state whether a condition is supported as the principal cause, a material contributor, an aggravating condition, or a deficiency whose causal role has not been established. The expert should not assign percentages or relative shares unless the evidence provides a reliable basis for doing so.

Precise language is not hesitation. It tells the reader what the investigation actually established.

Repair Scope Is a Separate Question

Causation and repair scope are related, but one does not automatically determine the other.

A deficiency may require correction because it does not comply with an applicable requirement, creates a continuing performance risk, or cannot reasonably remain as part of the repaired assembly. That may be true even when the deficiency has not been shown to cause the specific event or damage alleged in the case.

The reverse can also occur. A localized causal condition may support a limited repair even though unrelated deficiencies exist elsewhere. A broad replacement recommendation should not be used as retroactive proof that every identified deficiency caused the reported failure.

Repair analysis should consider the present condition, applicable requirements, access, compatibility, recurrence risk, and practical feasibility. Causation should explain why the condition occurred.

Keeping those questions separate allows counsel to evaluate liability and remedy without treating one as proof of the other.

The Report Must Show the Connection

A vulnerable report may state:

Mortar coverage was deficient. Therefore, inadequate mortar coverage caused the cracking.

The conclusion may be correct, but the reasoning is missing.

A more defensible analysis would identify the applicable requirement, the observed contact at sampled locations, the failure interface, the crack pattern, the corresponding substrate condition, the evidence from performing areas, and the reasonable alternatives considered.

It may conclude:

Removal at sampled locations documented mortar contact below the applicable requirement. The principal cracks aligned with a substrate discontinuity, and limited contact was also present outside the cracked pattern. The evidence supports limited contact as a bond-related deficiency and a possible contributor to local looseness, but it does not establish limited contact as the initiating cause of the aligned cracking.

That opinion is narrower than the shortcut. It is also easier to trace and defend.

The Distinction Matters Under Oath

Opposing counsel may ask:

What requirement did the installation violate?

How did that departure produce this particular condition?

Was the same deficiency present where no distress occurred?

Did the distress occur where the deficiency was not found?

What evidence establishes when the mechanism operated?

Are you identifying the cause, a contributing condition, or simply noncompliant work?

Does your repair opinion depend on a causal conclusion you have not established?

Those questions can expose reports that move directly from noncompliance to causation. They do not weaken an opinion that has already separated the issues and explained the connection.

An expert should be able to identify the deficiency, describe the mechanism, show how the pattern and timing support it, address meaningful alternatives, and state the causal role the evidence supports.

Final Thoughts

Deficiencies matter. They should not be minimized merely because causation is disputed or cannot be fully established.

But the existence of noncompliant work is not a substitute for a causal analysis.

A reliable opinion identifies the applicable requirement, documents the departure, defines the condition that must be explained, evaluates the mechanism, compares the pattern and timing, considers reasonable alternatives, and states the deficiency's causal significance without exceeding the evidence.

Sometimes the deficiency is the cause.

Sometimes it is one contributor among several.

Sometimes it is real, important, and unrelated to the reported failure.

The expert's responsibility is to explain which conclusion the evidence supports.

Find the deficiency. Then establish the connection.

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