



National Tile and Stone Authority

NTSA Forensic Principles Series

The Anatomy of a Defensible Expert Opinion

Eight Principles That Separate Reliable Forensic Analysis from Unsupported Conclusions

The first explanation sounded reasonable. Individual mosaic pieces were coming loose in a wet installation, and the initial opinions focused on inadequate mortar coverage and missing movement joints. Both conditions can contribute to tile failures, so the theory was easy to accept.

The physical evidence, however, did not fully support it. The pieces were separating from the mesh-backed assembly in a way that coverage alone did not explain. Destructive examination and testing eventually identified a different mechanism: the adhesive used to secure the fabric mesh to the backs of the mosaics was water-soluble. Moisture degraded that adhesive, allowing the individual pieces to release.

The visible condition had been correctly identified. The failure mechanism had not.

That distinction captures the central challenge of expert work. Attorneys, judges, and juries are often presented with competing opinions from professionals who are all experienced, qualified, and confident. The real question is not which expert sounds more certain. It is which opinion was developed through the more reliable process.

Credentials establish that an expert is qualified to offer an opinion.

They do not establish that the opinion is correct.

Experience helps identify possibilities.

Evidence determines which of those possibilities can actually be supported. A defensible opinion is therefore more than a conclusion. It is the result of a disciplined investigation in which assumptions are identified, observations are separated from interpretations, competing explanations are evaluated, and the limits of the evidence are stated honestly.

Over the years, these principles have become the foundation of our forensic methodology.

They apply well beyond tile and stone because they are principles of disciplined investigation, not principles of a particular trade.

Together, they describe the habits that allow an opinion to be understood, questioned, tested, and ultimately defended.

Principle 1

Start With Questions, Not Conclusions

Every assignment arrives with a history. The owner may believe the contractor caused the problem. The contractor may blame the product. The manufacturer may point to the installation. Attorneys develop legal theories, insurers evaluate claims, and previous consultants may already have written reports.

That information is useful because it identifies the concerns of the parties. It becomes dangerous when it quietly becomes the expert's conclusion before the investigation begins.

In the mosaic matter, the accepted story was an installation failure. Had the investigation begun by asking only whether mortar coverage was deficient or movement joints were missing, the analysis could have remained trapped inside that theory. The more basic question was different: Where did the separation actually occur?

A reliable investigation begins by identifying what is known, what has merely been reported, and what still needs to be established. The first task is not to decide who is responsible. It is to define the technical question correctly.

Experience may suggest likely answers quickly, but that is where discipline matters most. Familiarity should guide the search, not end it. The purpose of an investigation is not to confirm the first plausible theory. It is to test it.

Principle 2

What You See Isn't Always What Happened

Forensic work begins with observable conditions. Tile is cracked. Stone is stained. Water appears below a shower. A floor sounds hollow. Mosaic pieces have detached. These observations are important, but none of them identifies its own cause.

The same visible condition may result from several different mechanisms. A crack may reflect substrate movement, shrinkage, impact, material behavior, insufficient support, or more than one condition acting together. Water outside a shower may involve the waterproofing, plumbing, drain connection, enclosure,

penetrations, or adjacent construction.

Loose mosaic pieces may suggest inadequate mortar contact. Yet if the separation occurred between the tile and the mesh adhesive, the appearance of loose tile does not prove that the field-applied mortar caused the failure.

The observation tells the expert where to begin. The investigation must determine what the observation means. Moving directly from appearance to causation is not efficiency. It is an analytical shortcut, and shortcuts are difficult to defend when another reasonable explanation fits the evidence.

Principle 3

Never Be More Certain Than the Evidence Allows

Litigation creates pressure for clear answers. Clients want to know what happened. Attorneys need opinions they can evaluate. Judges and juries must decide between competing explanations. The evidence, however, does not always provide complete certainty.

An investigation may occur years after the event. Conditions may have changed, repairs may have altered the assembly, and critical materials may no longer exist. Records may be incomplete. Sampling may be limited. Testing may document the present condition without establishing what existed at the time of the reported failure.

Experience is invaluable because it helps identify patterns, recognize possibilities, and interpret technical findings.

Evidence is indispensable because it determines which of those possibilities can actually be supported.

Experience may guide the investigation.

It cannot replace the facts.

Every opinion still requires a reliable factual foundation that can be explained, examined, and defended by the expert who formed it.

There are times when the available evidence supports a cause with a high degree of confidence. There are other times when it supports only a probable explanation, several reasonable possibilities, or no reliable conclusion at all. Those levels should not be presented as though they are the same.

The available evidence does not allow us to reach that conclusion.

That statement is not an admission of weakness when it is accurate. It shows that the opinion remains proportional to the evidence.

Credibility is not built by answering every question. It is built by recognizing which questions can honestly be answered.

Principle 4

Challenge Your Own Opinion Before Someone Else Does

Once a preliminary theory begins to fit the facts, the investigation becomes vulnerable to confirmation bias. Supporting evidence receives attention, while conflicting evidence may appear less important. This can happen without dishonesty and without conscious advocacy. It is a normal human tendency, which is precisely why it must be addressed deliberately.

Whenever we believe we have identified the cause, we ask what evidence would contradict that conclusion. What else could produce the same condition? What should be present if the theory is correct? What findings would make it less likely? Have the alternatives been evaluated, or merely mentioned?

In the mosaic investigation, inadequate coverage and missing movement accommodation could not simply be dismissed. They had to be examined as possible causes. The question was whether they explained the specific pattern of separation better than deterioration of the mounting adhesive. The stronger opinion emerged only after the alternatives were compared against the physical evidence.

Newer experts sometimes feel pressure to identify the problem quickly because they want to demonstrate knowledge or avoid increasing the client's cost. Those concerns are understandable. The greater cost, however, is an opinion that later requires retreat, additional testing, or defense against a question that should have been asked before the report was written.

The best time to discover a weakness in an opinion is before anyone else has the opportunity to find it.

That should happen during our own investigation, not during cross-examination.

Principle 5

Separate Observation from Interpretation

A reliable report allows the reader to see where the facts end and the expert's reasoning begins. That requires a clear distinction between observation, interpretation, and causation.

An observation describes a condition: individual mosaic pieces are detached; adhesive residue remains on the mesh; mortar is present behind the sheet; moisture exposure occurred. An interpretation

explains what those findings may indicate. A causation opinion goes further by identifying the mechanism that produced the failure.

Combining all three into a single sentence may make a report sound decisive, but it conceals the reasoning that should connect them. If an expert writes that tiles are loose because the installer failed to achieve adequate coverage, the sentence presents the cause as though it were directly observed. It was not. The looseness was observed. The cause must be demonstrated.

Keeping those steps separate strengthens both the investigation and the report.

Observations can be verified.

Interpretations can be challenged.

Causation can be tested against competing explanations.

That distinction becomes especially important during deposition and trial.

Opposing counsel often moves back and forth between what an expert actually observed and what the expert inferred from those observations.

If those steps were never separated during the investigation, they become difficult to separate under oath.

A disciplined investigation makes that distinction from the beginning.

It allows the reader to follow the path from observation to interpretation, and from interpretation to causation, rather than being asked to accept the conclusion on the expert's authority alone.

Principle 6

A Deficiency Is Not Necessarily the Cause of the Failure

Construction projects often contain more than one deficiency. Some may violate an industry standard or manufacturer instruction. Some may reflect poor workmanship. All relevant conditions should be documented, but their existence does not establish that they caused the damage being claimed.

This distinction was central to the mosaic matter. The absence of movement joints may have been a legitimate deficiency. Mortar contact may also have warranted evaluation. Neither condition, standing alone, explained why individual pieces were separating

from the mesh-backed product after moisture exposure.

The analysis required three separate questions: What deficiencies exist? Which of them are technically related to the reported failure? What evidence supports the conclusion that a particular deficiency caused or materially contributed to that failure?

An installation can contain numerous departures from accepted practice and still fail for a different reason. Conversely, a single concealed condition may cause widespread failure even where the visible workmanship appears excellent. A report that lists every deficiency without addressing relevance may be comprehensive, but it is not necessarily a causation analysis.

Identifying a deficiency is only the beginning of the analysis.

Demonstrating that it caused or materially contributed to the reported failure is the conclusion.

Confusing those two steps is one of the most common errors in forensic investigations.

Principle 7

An Expert's Duty Is to Seek the Truth, Not to Support a Position

Every expert is retained by a client, and every client naturally hopes the evidence will support their position.

Sometimes it does.

Sometimes it does not.

That should never change the way the investigation is conducted.

I have always believed that my client deserves my honest opinion before hearing a different one from opposing counsel, another expert, or the court. If the evidence supports the client's theory, I will explain why. If it does not, I will explain that too.

Those conversations are not always easy.

I have had to tell clients that the evidence did not support the opinion they hoped to receive. I have also had to explain that the available evidence was incomplete and did not permit a reliable conclusion.

That is not a failure of the investigation.

It is part of being an independent expert.

Seeking the truth does not mean that an expert will always find it completely. Evidence may be missing, conditions may have changed, and some questions may remain unanswered.

The responsibility is to pursue the truth while keeping every opinion

within what the available evidence can honestly support.

I was not retained to prove a theory.

I was retained to investigate it.

An opinion that changes to satisfy a client may sound helpful in the short term. It becomes far less helpful when it is tested in deposition or trial.

Clients hire experts for their knowledge.

Courts rely on experts for their independence.

Neither responsibility can be fulfilled without intellectual honesty.

Principle 8

A Reliable Opinion Should Survive Honest Scrutiny

Many years ago, I encountered a simple exercise that stayed with me.

Participants were given ten questions and told they had only one minute to complete them. Most immediately began answering as quickly as possible.

The first instruction, however, told them to read all ten questions before answering.

The final question said:

Do not answer any of the previous questions.

The exercise was not really testing intelligence.

It was testing discipline.

Forensic investigations can present the same problem.

An intake form may describe a porcelain tile failure. Everyone accepts that description and begins examining workmanship, mortar coverage, substrate preparation, and installation procedures.

The investigation becomes more detailed and increasingly sophisticated.

Then laboratory testing reveals that the product did not meet the applicable standard for porcelain tile.

The investigators may have spent considerable time answering a technically complex question before confirming that it was the

correct question.

The problem was not a lack of knowledge.

The first assumption had never been verified.

Experts sometimes believe that their value is demonstrated by identifying a sophisticated failure mechanism. Experience has taught me that the most sophisticated explanation is not always the correct one.

Sometimes the answer requires extensive testing and analysis.

Sometimes it is sitting in plain sight.

The expert's responsibility is not to prefer complexity or simplicity. It is to determine which explanation is best supported by the evidence.

Before finalizing an opinion, I ask myself:

What assumptions did I accept?

What evidence contradicts my conclusion?

What reasonable alternatives remain?

What would cause me to change my opinion?

If the opinion cannot survive those questions, it is not ready for anyone else to rely on.

The last meaningful challenge to an expert opinion should not come from opposing counsel.

It should come from the expert who formed it.

Final Thoughts

Every expert can offer an opinion.

A defensible opinion must be earned.

It is earned by asking better questions than anyone else.

By resisting the temptation to confuse observations with conclusions.

By recognizing the limits of the available evidence.

By challenging your own opinions before someone else has the opportunity.

And by following the evidence wherever it leads, even when it leads away from the conclusion you expected to find.

Experience matters.

Credentials matter.

But neither can compensate for a flawed methodology.

In the end, credibility is not something an expert claims.

It is something the investigation earns.

That is the anatomy of a defensible expert opinion.

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