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## **Proper Use of Inference, Extrapolation, and Allocation in Property Claims**

Claims professionals, attorneys, and experts use inference, extrapolation, and allocation often without realizing the full potential implications or bases for these methodologies. Are these the best methods to bolster your case? Inference is a conclusion based on evidence and reasoning; extrapolation is estimating or concluding something by assuming that existing trends will continue; and allocation relates to assigning responsibility among different interested parties. This paper discusses considerations on the admissibility and use of extrapolation, inference, and allocation.

The roundtable panel discussion will include discussion on how to address a multi-phase development with cookie-cutter homes when there are multiple contractors involved, varying contractor crews within each, and other variables. Other questions for discussion include: Can we infer opinions from one home to another, extrapolate resultant damage, or even allocate damage when such variables exist? For claims professionals and counsel, what are the costs associated with these methods? When is a greater investment in initial intrusive testing necessary, and are there instances in which extrapolation or inference can be used to lower overall costs? When is there a hidden back-end cost, related to motions to strike experts that may have improperly relied on extrapolation and inference, or whose allocation methodology is unclear or unfounded? Case studies are very useful in illustrating these issues and will be discussed during this session.

### **I. Key Definitions**

#### **Extrapolation and its Use in Evidence**

In the construction defect litigation context, a well-known plaintiffs' firm describes extrapolation as a "type of circumstantial evidence whereby an inference is based on known facts and observations." The Oxford online dictionary defines "extrapolate" as "extend[ing] the application of [a ... conclusion...] to an unknown situation by assuming that existing trends will continue, or similar methods will be applicable." Webster's Ninth New Collegiate Dictionary defines extrapolate to mean "to project, extend, or expand known data or experience into an area not known or experienced so as to arrive at a conjectural knowledge of the unknown area."

Each definition of extrapolation is premised on the concept of creating an assumption about the unknown, based on a set of known data. Courts have not established a bright line rule for what types of data or information must be known – including the amount, the nature, etc. of the data – in order to ensure the reliability of the extrapolated conclusion. The U.S. Supreme Court has stated that something more than the *ipse dixit* (an unproven statement) of an expert is required to connect the known information to the extrapolated conclusion. See *General Elec. Co. v. Joiner*, 522 U.S. 136, 146 (1997).

### **Inference as a Scientific Principle**

The Oxford online dictionary describes an inference as “A conclusion reached on the basis of evidence and reasoning.” The Wikipedia article on inference describes inference more precisely, characterizing inference as both the conclusion reached and the process by which it is reached. Per Wikipedia, inferences are steps in reasoning, divisible into three kinds: deduction, induction, and abduction. Deduction is the inference most commonly associated with scientific principles in the context of construction disputes. Deduction is inference deriving logical conclusions from premises known or assumed to be true.

The hallmark of inference is the use of reasoning and logic to arrive at conclusions in a case. The failure of an expert to employ sound reasoning or logic supports an argument that the inferred opinion is either susceptible to attack or should be stricken outright.

### **Allocation**

The concept of allocation arises from legal requirements that a plaintiff provide a computation of damages claimed; that the plaintiff provide the factfinder with a reasonable basis for calculating actual damages; and that damages must be traceable to and the direct result of the wrong sought to be redressed. These proof requirements are why plaintiffs propound expert allocation reports, identifying the extent of the responsibility of different party defendants for subsets of the claimed damages.

Allocation reports are frequently criticized for the failure to employ a recognized methodology. One defense firm has written that there is no basis for the admission of allocation reports, and that “No college, engineering, or graduate course exists which instructs as to a reliable, replicable method of allocation of fault with a known or demonstrable error rate.” Thomas R. Buchanan and Jason L. Buchanan, *Daubert Motions in Construction Litigation* (2014)

## **II. The Requirement of Scientific Methodology**

Federal Rule of Evidence 702 establishes the requirements for testimony by an expert witness, establishing that a witness who is qualified as an expert by knowledge, skill, experience, training, or education may testify in the form of an opinion or otherwise if:

- (a) the expert's scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue;
- (b) the testimony is based on sufficient facts or data;
- (c) the testimony is the product of reliable principles and methods; and
- (d) the expert has reliably applied the principles and methods to the facts of the case.

The requirement for reliability of the principles and methodology is intended to ensure that the expert's opinion is "genuinely scientific." *Rosen v. Ciba-Geigy Corp.*, 78 F.3d 316, 318 (7th Cir. 1996).

Case law emphasizes the necessity of having the courts examine these factors, acting as a gatekeeper to ensure that the opinions offered are supported by reliable principles and methods:

While meticulous Daubert inquiries may bring judges under criticism for donning white coats and making determinations that are outside their field of expertise, the Supreme Court has obviously deemed this less objectionable than dumping a barrage of questionable scientific evidence on a jury, who would be even less equipped than the judge to make reliability and relevance determinations and more likely than the judge to be awestruck by the expert's mystique.

*Allison v. McGhan Med. Corp.*, 184 F.3d 1300, 1310 (11th Cir. 1999).

The importance of avoiding introduction of unfounded or insufficiently reliable principles and methods is especially important in light of jury research that concludes:

- (a) lay jurors have considerable difficulty evaluating the quality of scientific evidence;
- (b) as the scientific evidence becomes more complex jurors tend to turn to more superficial cues to determine its validity;
- (c) fact finders are more persuaded by storytelling and clinical testimony than by quantitative science;
- (d) jurors are prone to give more credence to expert testimony provided at trial than they would have otherwise outside of court; and
- (e) cross-examination is often ineffective in undoing the impact of erroneous or misleading scientific evidence.

Thomas R. Buchanan and Jason L. Buchanan, *Daubert Motions in Construction Litigation* (2014)

## **Statistics in Extrapolation**

Statistical validity of the sample is a leading consideration as to the reliability of an extrapolation opinion. For example, in the *Ayala v. Pardee Const. Co.*, opinion, the plaintiff offered an argument that known construction defects in one single family residence could be determined to exist in the plaintiff's home, via extrapolation based on the inspection of the other similarly constructed home. The court rejected this argument,

asking: “[W]hen is a sampling “sufficient”? On this record, we have no way of knowing whether the alleged defects in the Rochelles' houses and the Ayalas' houses were so similar as to make expert testimony regarding the latter unnecessary.” *AYALA v. PARDEE Constr. Co.*, E028639, E029242, 2002 Cal. App. Unpub. LEXIS 9107, at \*31 (Sep. 30, 2002).

On the opposite end of the spectrum, courts have permitted expert extrapolation opinions when, as the plaintiff’s expert testified, the “sampling sizes created by his testing procedures formed a statistical basis with an accuracy of 99.3%, meaning that if he ‘opened up the entire building, 99.3 percent of the building would be found just the way I have described it.’” *Wash. Courte Condo. Ass’n-Four v. Wash.-Golf Corp.*, 643 N.E.2d 199, 212 (Ill. App.1994).

Most expert extrapolation opinions exist in the area in between no sampling on the subject building, and sampling with a 99.3% accuracy. Questions to consider when challenging the adequacy or accuracy of a sample include the validity of the sample size, and the confidence interval (or margin of error) involved in the sample. See *Bell v. Farmers Ins. Exch.*, 115 Cal. App. 4th 715, 753, 9 Cal. Rptr. 3d 544, 576-77 (2004) (discussing acceptance of inferential statistics). It is rare, in a construction defect case, for a plaintiff’s expert to offer a statistical analysis that provides a confidence interval for the extrapolated opinions based on limited intrusive testing. In a sufficiently complex or high value case, it may be worthwhile to retain a consulting statistician to offer analysis on the sufficiency of the intrusive testing sample.

Another question that should be evaluated is whether the sample itself was randomly selected, and whether the sample was designed to be representative of the building(s) or site. If an expert concedes that intrusive testing was only conducted at five buildings with visible water damage, and that the results were then extrapolated to conclude that all fifty buildings at the project suffered from the same construction defects, the expert has failed to reliably apply the principles and methods to the investigation.

### **The Role of Corroborating Evidence in Extrapolation and Inference**

In construction cases, the statistical significance of the intrusive testing sample is often not the only evidence considered by the court in determining the admissibility of an expert extrapolation opinion under Rule 702. Other corroborative evidence, including visual observations, deposition testimony, witness interviews, and documentation relating to construction all serve as corroborating evidence that bolster the expert’s conclusions. See *Sentinel Mgmt. Co. v. Aetna Cas. & Surety Co.*, 615 N.W.2d 819 (Minn. 2000); *Consolidated Electrical Distributors, Inc. v. Kirkham, Chaon & Kirkham, Inc.* 95 Cal. Rptr. 673 (1971). Defense lawyers have asserted that the true rule on extrapolation evidence that emerges from case law is that “to be admissible, extrapolation evidence based on statistically insignificant sample sizes or other scientifically invalid sources must be supported by corroborating evidence to verify the reliability of the extrapolation.” Howard A. VanDine III and Erik Norton, *The Foundation of Extrapolation Evidence*, Construction Law (DRI 2007).

Defense counsel should closely examine cases in which the sample size is insignificant and in which the expert opinion should necessarily be required to include corroborative evidence, to determine whether the expert has failed to, or chosen not to, consider available corroborative evidence. Courts have stricken expert testimony that improperly “cherry picks” the facts considered to render an expert opinion. See *Barber v. United Airlines, Inc.*, 17 F. App'x 433, 437 (7th Cir. 2001) (“A review of Dr. Hynes's proffered expert opinion, his deposition testimony, and the overall record confirms the district court's conclusion that in formulating his opinion, “Dr. Hynes relied on weather data, but he rejected some weather data that contradicted his opinion.” ... Dr. Hynes “rejected the testimony of the pilot and the copilot, which contradicted his opinion, [and] in formulating his opinion, Dr. Hynes did not give any additional data or information that he relied upon, which formed the basis of rejecting some of the weather data and the opinions of the copilots.” Dr. Hynes also did not adequately explain why he ignored certain facts and data, while accepting others. Nor did Dr. Hynes present any other data which supported his opinion--he merely accepted some of the testimony and weather data that suited his theory and ignored other portions of it that did not. Because in formulating his opinion Dr. Hynes cherry-picked the facts, he considered to render an expert opinion, the district court correctly barred his testimony because such a selective use of facts fails to satisfy the scientific method and *Daubert*, and it thus fails to “assist the trier of fact.”

### **Allocation and Methodology**

Corroborative evidence and inferential conclusions are often the principal bedrock for allocation opinions and allocation methodology. Areas of criticism as to the sufficiency of an allocation report, as noted above, focus on whether there is in fact any recognized principle or method for discerning damages allocable to one trade versus another, when both trades' work is implicated in defective construction. In addition, an expert's “technical or specialized knowledge” should be closely examined, to understand exactly what type of knowledge the expert has, that both supports this type of analysis and can therefore assist the trier of fact.