

Construction Defects

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INSURANCE Florida Supreme Court agrees to consider coverage for faulty work **P. 16**

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Station Fire Suit Parties Debate Dismissal Of TV Companies

PROVIDENCE, R.I. — Three affiliated defendants in the suits arising from The Station nightclub fire argue in a March 1 motion that they should be dismissed on the strength of a previous ruling in the case; the plaintiffs counter in an April 20 opposition that the reasoning behind the original order remains wrong. **SEE PAGE 4.**

Parties In Philadelphia Arts Center Suit Settle Confidentially

PHILADELPHIA — Parties sparring over problems with a performing arts center in Philadelphia have reached a confidential settlement agreement ending the litigation, according to a joint March 3 statement. **SEE PAGE 5.**

Anti-SLAPP Proper In Construction Defect Case, Panel Finds

LOS ANGELES — Defendants in a California construction defect case had reason to believe a paint contractor was partially liable for the alleged defects and filed proper motions to dismiss the contractor's suit against them for malicious prosecution, a panel of the Second District California Court of Appeal held March 27. **SEE PAGE 6.**

Court: Proposed Jury Instruction Wrong, New Trial Denial OK

BOISE, Idaho — A contractor's proposed jury instruction was a misstatement of Idaho law, and the trial court in the case properly declined to administer it, the state Supreme Court found April 24. **SEE PAGE 7.**

Nevada Court Raises Construction Defect Winners' Fee Award

CARSON CITY, Nev. — Plaintiffs who prevailed in a single-home construction defect suit are entitled to attorney fees and costs under the Nevada statutory scheme, the state Supreme Court held April 27. **SEE PAGE 8.**

Homeowner Wins Roofing Appeal, Gets Twice The Legal Fees

FORT WORTH, Texas — A roofing contractor who was sued based on a poor roof replacement could not cancel the jury's findings in favor of the plaintiff based on lack of presuit notice because the statute in effect at the relevant time did not allow for such dismissals, a Texas appellate panel held April 13. **SEE PAGE 9.**

Maine Judge Favors Construction Defect Plaintiffs, Orders Repairs

BANGOR, Maine — A general contractor is obligated to pay for repairs to several items in the home of two plaintiffs, notwithstanding its contention that it had not been given sufficient notice and opportunity to correct the problems before suit was initiated, a Maine superior court judge held Feb. 17.

Sufficiency Of Notice
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No Timely Answer Equals Default Judgment In Louisiana Defect Case

LAKE CHARLES, La. — Illness of a defendant in a construction defect case and problems mailing responsive pleadings to the court did not justify the defendant's failure to timely answer the plaintiffs' petition, and, thus, a default judgment order was properly entered, a Louisiana panel held April 19.

Default
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Kansas Federal Judge Puts Off Faulty Tower Trial Due To Weather

WICHITA, Kan. — A federal judge in Kansas on April 11 granted an emergency motion for continuance of a construction defect trial on the ground that the defendant's counsel's main offices had been damaged by a weather phenomenon but did not allow the requested 120 days.

Continuance
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Commentary

Another Perspective On Extrapolation Evidence

By
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and
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[Editor's Note: Ronald M. Sandgrund and Scott F. Sullan of Vanatta, Sullan, Sandgrund, Sullan & Smith, P.C., Denver, Colorado, have extensive trial and appellate experience litigating construction defect, construction material, multi-family community, class action and liability insurance lawsuits. They have been appointed class counsel in nine cases and have obtained a successful verdict in one of the largest residential homeowner class actions ever certified, the Mission Viejo case. They successfully negotiated a class action settlement on behalf of over 25,000 Colorado homeowners with Richmond American Homes in 1996. During the past year, they negotiated a \$39 million settlement with a different national homebuilder, as well as a \$32.5 million settlement in a defective windows class action.]

Messrs. Sullan and Sandgrund frequently lecture and write on construction and materials defect liability and insurance issues. They co-authored the 414-page Residential Construction Law in Colorado, published by the Colorado Bar Association and available from CLE of Colorado, Inc. Messrs. Sandgrund and Sullan often testify before the Colorado legislature regarding proposed laws affecting Colorado homeowners, and their articles have been cited in various court opinions. They were instrumental in crafting the Colorado Construction Defect Action Reform Acts of 2001 and 2003 so as to maintain a balance between homeowner, builder-developer and insurer concerns. Leslie A. Tift, Esq. assisted with the preparation of this article. Their law firm's website is <http://www.vsss.com>. Copyright 2005-2006 by the authors. Responses to this commentary are welcome.]

Abstract

This article discusses "extrapolation" evidentiary issues that arise frequently in construction defect lawsuits involving multi-family residential developments. The article responds, in part, to the criticisms leveled by Patrick L. Perrone and Brian J. Osias at extrapolated expert opinions in their article *Is Expert Extrapolation in Construction Defect Cases Sufficiently Reliable?*, *Mealey's Litigation Report: Construction Defects*, Vol. 7, Iss. 3 (April 2006), at 28.

"Extrapolation," an often misused term, generally refers to an expert's opinions regarding defects and repairs based on the direct examination of some, but not all, of the construction elements in a multi-family development, apartment building or other large structure or integrated construction project. This article describes typical situations where "extrapolation" arises; a proposed analytic approach to determining the admissibility of such evidence under Colorado's Rules of Evidence; and practical problems courts and practitioners likely will face applying this analytic framework. Because Colorado's evidentiary rules are patterned on the Federal Rules of Evidence, and Colorado has adopted a *Daubert*-like approach to the admission of expert testimony, this article's analysis of extrapolation evidence admissibility will be useful to non-Colorado practitioners as well.¹

Extrapolation

Disputes regarding proper methods for determining damages often arise in cases involving numerous

multi-family living units located in a single project, where the same constructed element is repeated. Parties frequently attempt to prove the existence or non-existence of defects or damage in similarly constructed or designed construction elements by presenting evidence of the condition of some, but not all, of the construction elements, and then having an expert opine that the defect or damage in, and any required repairs to, the observed construction element applies to all substantially similar, but unobserved, construction elements. Some call this investigatory and analytic methodology "extrapolation," a term that may be misleading when used in the context of a lawsuit rather than in a scientific article.

A Typical Fact Pattern

A typical "extrapolation" case might involve a project's "building wrap" and flashings. Building wrap often consists of a water-resistant material that is delivered to a jobsite in four-foot or wider rolls. The material is "wrapped" in overlapping layers, sometimes in one continuous sheet across the face of the building, but must be cut and detailed around fenestrations such as windows and doors. Proper building wrap installation requires that layers located higher on a building exterior be placed on top of ("lapped" over) lower layers so that as penetrating moisture from rain and snow runs down and across the layers, the water is directed away ("shed") from the underlying building components. Where the layers are "reverse-lapped," the weatherproofing intent is defeated. Because the building wrap is often applied from scaffolding, the layers inevitably are lapped from the bottom up or the top down of the building face. None of the building wrap is visible without removing or cutting into the exterior cladding, such as wood siding, stucco or artificial stone veneer, or pulling apart window and door assemblies.

The flashings serve a similar purpose and are typically installed where the wrap interfaces dissimilar materials, such as at windows, and at transitions where differences in building topography occur. Portions of the flashings often can be observed without disassembling the building exterior.

Due to significant moisture entry complaints concerning two west-facing units in a ten-building condominium complex (consisting of four units to a building), the homeowner association and the devel-

oper retain moisture barrier experts. The association's expert cuts into and invasively examines the interface between the windows and adjacent exterior cladding near leaks reported in the two leaking units, and also in two north-facing units located in other buildings. He observes that at all inspected locations, the building wrap is improperly "reverse-lapped," and the adjacent window flashings are improperly installed, drawing water into the wall cavity. This water has penetrated the drywall in the two leaking units, but has merely stained the wall cavity in the other two units and not yet penetrated the drywall because the other two units face a direction that is subject to considerably less weathering.

From this evidence, the association's expert tentatively concludes that the building wrap and flashings may have been improperly installed around every window and that the entire project may have to be "skinned," *i.e.*, the exterior cladding removed, and all the building wrap and flashings redone, or serious wood rot, mold growth and interior leak problems are likely to develop. The association's lawyer, in consultation with the expert, wants to devise a forensic inspection program to determine the extent of the misapplication problem such that the data and resulting conclusions will be admissible at trial.

From the same evidence, the builder's expert concludes that the installation errors are idiosyncratic. He recommends that only the two areas of the reported leaks be repaired. He tentatively concludes that the other two areas exhibit very little evidence of moisture penetration, and that the staining simply may have occurred during construction when those areas were exposed to the elements.

At this juncture, an objective observer likely would reasonably conclude that some additional investigation is warranted, but that deconstruction of the entire project's exterior cladding at extraordinary cost to permit inspection of every square inch of the underlying building wrap is unnecessary or premature. All parties agree that visible damage from moisture gradually finding its way into wall cavities usually takes many years to appear. The association's counsel warns that a two-year statute of limitations may apply to the association's potential claims against the builder, and that a possible six or eight-year statute of repose may apply. The project is already five years

old. The builder's expert suggests a "wait-and-see" approach as being most cost-beneficial.

Extrapolation Defined

The term "extrapolation" has no well-accepted meaning in the law. There are two common definitions of "extrapolation," one scientific, the other experiential:

- 1: (mathematics) calculation of the value of a function outside the range of known values
- 2: an inference about the future (or about some hypothetical situation) based on known facts and observations.²

The Colorado Rules of Evidence govern the admissibility of an expert's opinions in that state regarding defects and repairs based on the direct examination of some, but not all, of the construction elements in a large structure or series of related structures.

Although the fact of damage must be proven by a preponderance of the evidence, Colorado does not require proof of damages with scientific precision: the fact finder may, by utilizing all the evidence and the reasonable inferences to be drawn from such evidence, devise a fair method of assessing damages.³ Colorado courts regularly instruct juries that "difficulty or uncertainty in determining the precise amount of any damages does not prevent you from deciding an amount," and that the jury should use its "best judgment based on the evidence."⁴ Colorado generally recognizes the propriety of admitting evidence based on reasonable inferences drawn from statistics and other types of estimates.⁵

The commonly accepted definition of extrapolation as "an inference . . . based on known facts and observations" is consistent with Colorado's jury instructions directing that "evidence may be either direct or circumstantial," and that "circumstantial evidence is the proof of facts or circumstances from which the existence or nonexistence of other facts may reasonably be inferred."⁶ Colorado makes no distinction between the effects of direct evidence and circumstantial evidence.⁷ Taken together, these basic evidentiary concepts assist juries in considering the validity of, and judging the weight, if any, to be accorded, opinions founded on "extrapolation," that is, inferences based on known facts and observations.

Case Law

Only a handful of published decisions address the admissibility of opinions developed through extrapolation. These few cases applied the relevant jurisdiction's evidentiary rules to the particular facts before the court in deciding whether extrapolation was proper in each case.⁸ Thus, in Sentinel Management Co. v. Aetna Casualty & Surety Co.,⁹ the defendant filed a motion *in limine* to prevent the plaintiff's expert from "extrapolating" from just four positive dust samples taken at five apartment units at a 450-unit apartment complex that asbestos fibers existed in all 450 units. At a hearing to determine the admissibility of the expert's testimony, the expert explained that his conclusion was based on his testing sample (five units out of 450), his observation of the property and information from building managers as to the materials used at the project.¹⁰ The trial court allowed the expert's opinion into evidence, ruling that his investigative methods "went to the weight, rather than the admissibility of his testimony, and thus [were] a matter for the jury."¹¹ The Minnesota Supreme Court agreed and affirmed the holding.

Similarly, in Consolidated Electrical Distributors, Inc. v. Kirkham, Chaon & Kirkham, Inc.,¹² the California Court of Appeals affirmed a trial court's decision to allow a supplier to use "extrapolation" to prove that his fixtures were used in the construction of an elementary school. The court affirmed the trial court's holding that it was not necessary for the plaintiff's employee to have "physically observed all of the materials being actually incorporated into the school building."¹³ The court also held that the employee's testimony was not "deficient because, in those instances where the blueprints indicated that certain rooms were identical in configuration with respect to the required fixtures, *he extrapolated* on the basis of his physical examination of a sampling of the *identical premises*."¹⁴ The court explained that the "extrapolation" methodology used went to the weight of the evidence, not its admissibility.

Finally, Washington Courte Condominium Ass'n-Four v. Washington-Golf Corp.¹⁵ affirmed a \$1.8 million damages verdict based on an engineering expert's extrapolation from limited data of the need to extensively repair construction defects in areas never examined by the engineer or his staff. Without squarely addressing the admissibility of the engineering expert's

testimony, the Illinois Court of Appeals sustained the verdict based on the engineer's testimony that he and his staff had spent 1,900 hours investigating the cause of a building's structural problems, conducted a series of invasive tests, examined the roof with an infrared scan, performed an ASTM rain simulation test, developed "crack maps" and observed water infiltration migration patterns, and found that this sampling allowed him to conclude with near certainty that "if he 'opened up the entire building . . . [it] would be found . . .'" as he predicted.¹⁶

Other cases have allowed experts to extrapolate from limited data to opine whether a worker developed mesothelioma from exposure to a particular manufacturer's asbestos product, and to justify the removal of asbestos-containing materials.¹⁷ The common thread underlying the reasoning of this line of cases is simple practicality and economics. It was unworkable to test every cubic foot of air for asbestos fibers in Sentinel Management Co., to remove every electrical component to confirm its supplier in Consolidated Electrical Distributors, or to go back in time and measure a worker's asbestos exposure.

The U.S. Supreme Court has similarly approved of "extrapolation." In United States v. Fior D'Italia,¹⁸ the Court affirmed the IRS's use of an aggregate estimate of total tip income to assess a restaurant for FICA taxes on those tips. The IRS reviewed the restaurant's payment records for credit card customers to calculate an average percentage of tips. The IRS then reviewed other records to determine cash sales and applied the same average tip percentage to those sales. The Supreme Court rejected the restaurant's argument that this method was not sufficiently precise, noting that all audits are based on assumptions and inaccuracies, that claims need not be proven with precision, and that all that is necessary for admission of such evidence is some reasonable foundation.¹⁹

Similarly, in Texaco, Inc. v. Hasbrouck,²⁰ the Court rejected an oil company's argument in a price discrimination case that the plaintiff retailers' damages were based on imprecise estimates and inferences and likely contained errors. The damages were calculated based on an estimate of how many customers had been lost to other gas retailers who benefited from favorable pricing, and included certain assumptions as to ownership that could not be proven with certainty.

The Court held that regardless of the likelihood of some error, "the expert testimony nevertheless provided a sufficient basis for an acceptable estimate of the amount of damages."²¹ The Court recognized that damage issues in such cases "are rarely susceptible of the kind of concrete, detailed proof of injury which is available in other contexts" and must rely upon a "reasonable inference from the proof."²² Moreover, in General Electric Co. v. Joiner, the Court noted, "[t]rained experts commonly extrapolate from existing data," but added that a court is not required to admit opinion evidence connected to existing data only by the *ipse dixit* of the expert — a court may conclude that there is simply "too great an analytical gap between the data and the opinion proffered."²³

Thus, while courts preclude extrapolation when the record does not support its reliability, the case law certainly does not foreclose extrapolation as a matter of law or evince any special hostility to it.²⁴ For example, in Harbor House Condominium Ass'n v. Massachusetts Bay Insurance Co.,²⁵ the court refused to allow the proffered evidence because the plaintiff's experts wholly failed to perform *any* air pressure tests to locate the pipe damage at issue. These same experts also failed to visually examine *any* of the pipes, which examination was necessary, according to their own deposition testimony, to determine the cause of the damage.²⁶ The court observed, however, that with a proper foundation showing some evidence of current damage, extrapolation would be an appropriate methodology to calculate damages.²⁷

A number of Colorado district courts have addressed extrapolation evidence derived from poorly conceived and inadequately funded investigations into alleged construction defects. Under these circumstances, district court judges rejected opinions based on what was characterized as "extrapolation." These rulings were driven by the quality and quantity of the evidence before the court, with little sympathy allowed property owners unable or unwilling to fund a reasonably adequate forensic investigation.²⁸ Close examination of these orders reveals that Colorado district courts properly have not ruled extrapolation evidence inadmissible *per se*. Instead, courts simply have held a construction defect plaintiff to its burden of proving that a reasonable juror, in viewing the record and all favorable inferences to be drawn from it, could reasonably have found that the alleged defects existed,

or that the claimed damages were based on proof of the need for reasonable and necessary repairs; where a proper record is amassed, these same district courts allow the introduction of extrapolated opinions.²⁹

Applying *Shreck*

Colorado's leading scientific evidence case, *People v. Shreck*, instructs that depending on the nature of the evidence and the conclusions sought to be drawn from that evidence, courts may be required to exercise their "gatekeeper" function and preclude invalid or unreliable opinions.³⁰ *Shreck* held that inquiry regarding the admissibility of expert testimony generally should:

focus on the reliability and relevance of the proffered evidence and requires a determination as to (1) the reliability of the scientific principles, (2) the qualifications of the witness, and (3) the usefulness of the testimony to the jury.³¹

If a defendant contends that an admittedly scientifically valid test has been done incorrectly, or that invalid scientific assertions may be admitted under this liberal standard, such concerns often are assuaged by Colorado Rule of Evidence 701's overarching mandate of reliability and relevance. Sometimes, however, the proper course may simply be for the defendant to employ the usual "truth-seeking" mechanisms of trial.

Thus, *Shreck* noted that "experience-based" specialized knowledge is not well suited to this kind of admissibility analysis, because such experience-based knowledge is "not dependent on scientific explanation"³² Property owner counsel often argue that it is precisely this kind of experience-based knowledge that comprises the opinion testimony of most building envelope and other construction defect experts.³³ Where the trial court allows the admission of "experiential" opinions over a defendant's objection, *Shreck* teaches that the defendant's concerns can be "mitigated by vigorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof."³⁴ Moreover, simply because a forensic investigation into construction defects involves some "sampling" of those defects and resulting damage, it does not logically follow that the conclusions drawn from the investigation must satisfy strict statistical

and scientific parameters. Such sampling may be coupled with other direct and indirect evidence sufficient to allow a reasonable juror to draw the same conclusions of defect, damage, and needed repair proffered by the plaintiff's expert without engaging in improper speculation. The court, and jury, must gauge the record as a whole.

The Practical Need For Extrapolation In Construction Defect Cases

Colorado's appellate courts recognize that many construction defects are hidden beneath other constructed elements. "Even if a buyer is sufficiently knowledgeable to evaluate a home's condition, he rarely has access to make any inspection of the underlying structural work, as distinguished from the merely cosmetic features."³⁵ Underlying structural work, like underlying building wrap and flashings, in-wall insulation and concealed plumbing and electrical systems, all are covered up during the construction process, becoming difficult and expensive to access for inspection. Anyone who has experienced a roof leak knows that tracing the leak to its source is a difficult and costly endeavor. Colorado's appellate courts also recognize that damage arising from some construction defects may be latent, often not manifesting itself for years. Thus, in *American Employer's Insurance Co. v. Pinkard Construction Co.*,³⁶ a case involving insurance coverage for construction defects, the court noted that the defect-caused corrosion:

was a continuous, progressive condition which began immediately following the construction of the roof in 1973 and which was caused by the use of a certain fill material. By the time the portions of the roof collapsed in 1984 and the corrosion was discovered, the damage was widespread.³⁷

Given the hidden nature of many construction defects, the extraordinary cost of locating and exposing such defects to inspection and the potential for a latent defect to fester for many years before its injurious effect becomes obvious to a typical property owner, practical necessity suggests property owner experts and attorneys will seek cost-beneficial ways of proving the existence of and need to repair such defects without requiring the owner to incur the cost of dismantling his home.

Experts for both property owners and construction professionals have developed well-accepted techniques and methodologies for conducting forensic investigations that supply reasonably accurate and reliable information about the "whole" of a structure or a particular building component through examination of only a "part" of the structure or "samples" of the component. So long as a reasonable juror could find based on that evidence, and the reasonable inferences to be drawn from that evidence, the existence of a construction defect and the reasonableness and necessity of the prescribed repair, opinions regarding the same should be allowed.

In practice, a forensic expert typically will inspect as much of the exposed elements of a structure as can be reasonably examined; note those defects that are obvious; review the various developer, builder and sub-contractors' employees' deposition testimony regarding the construction methods used (and, if available, examine photographs of the work in progress); note damage patterns and correlate them to underlying defects known to create such patterns; examine the original plans and specifications; perform limited intrusive examinations;³⁸ utilize indirect tests such as dielectric and infrared scanning, which are forensic tools that can help identify areas of moisture intrusion and heat loss and, thus, may assist in identifying moisture barrier construction and thermal insulation installation deficiencies; and otherwise attempt to determine the cause of observed problems using a combination of direct, indirect and circumstantial evidence without unduly dismantling the structure. The Colorado Rules of Evidence expressly permit forensic experts to rely even on inadmissible evidence so long as it is of a type "reasonably relied on" by others in his field.³⁹

Moreover, evidence of a construction company's custom, habit and practice as to its construction methods is admissible and relevant, and may help fill "evidentiary gaps" in the foundation underlying an "extrapolated" opinion.⁴⁰ Often, a defendant's supervisory personnel will testify that he or she was present regularly at the site and took steps to ensure that the construction techniques approved for use by one subcontractor at one location on a particular building were used everywhere on that building, and that construction techniques approved for use by one subcontractor on a particular building were to be used

by other subcontractors on other buildings. Such personnel may testify that the inspection, supervision, approval and quality control measures employed were intended to assure uniform construction methods and quality levels throughout the project based on their personal participation in and supervision over the building's construction.

Suggestions that a forensic engineering expert may not properly draw his opinions from a mix of both *direct evidence* (e.g., various employees' testimony and defendants' construction records, coupled with the results of the expert's own observations, inspections and tests) and *indirect evidence* (e.g., the reasonable conclusions that may be drawn from such direct evidence, and circumstantial evidence of underlying water infiltration based on exterior evidence of water damage or moisture content readings) find no support in current Colorado law, and directly contradict the instruction to Colorado juries that the law makes no distinction between the effect of direct evidence and circumstantial evidence, that evidence may be either direct or circumstantial, and that circumstantial evidence consists of the proof of facts or circumstances from which the existence or nonexistence of other facts may reasonably be inferred.⁴¹

Thus, evidence may be adduced during discovery that building wrap is customarily "wrapped" in contiguous sheets across the face of a building such that if one pulls back the flashing or removes a trim piece around a window, one can see if the wrap was properly or improperly lapped. Property owner counsel then should be permitted to argue to the jury that it is reasonable to infer (to interpolate, as opposed to extrapolate) that *due to the nature of the installation process*, if there is direct evidence of reverse-lapping at one or more locations on an exposure, the wrap was reverse-lapped everywhere on that exposure.

However, determining whether a similar inference is proper as to the other three sides of the structure, or substantially identical structures "wrapped" by the same general contractor or subcontractor, likely will require additional supporting evidence. In one case the authors worked on, the builder's construction manager testified that he directed that each of 400 windows be installed in a particular way throughout a 60-unit condominium complex, and that he spot-checked the windows to ensure compliance with his

directive. Unfortunately, the installation method resulted in the windows being installed upside down, which was not apparent to the uninformed, but which resulted in the connected flashings being installed upside down, drawing water into, rather than shedding it away from, the wall cavities. Few courts would reject a damage claim based on the need to repair the windows because the property owner's expert had examined only 10 of the windows, all of which were installed upside down. From a strict scientific and statistical perspective, the 10-window sample size is too small to support the extrapolated conclusion that all 400 windows were installed upside down; but, when the expert's observations are combined with other, relevant evidence of the builder's custom and practice, it appears beyond dispute that, at minimum, a jury question is presented as to whether the other 390 windows need repair.⁴²

The Construction Industry's Historical Reliance On Extrapolation

Interestingly, the construction industry commonly relies on extrapolation methodology in building structures. Colorado builders and engineers face extrapolation issues everyday, and they typically deal with these thorny problems by relying on experience and judgment, rather than science and statistics. For example, a home is constructed on a "block" of earth underlying the home's footprint. A typical 2,000 square foot footprint for a ranch home without a basement is underlain by a soil mass. The physical and chemical characteristics of this soil will influence the structure's performance. Assuming for purposes of this discussion that the soil will be sampled to a depth of at least 15 feet beneath the home, the mass being "tested" consists of 30,000 cubic feet of soil.⁴³

Before starting construction, most Colorado soils engineers and builders rely on small samples from a soil boring,⁴⁴ usually at least 15 feet deep and three inches in diameter, totaling about 2.9 cubic feet of soil. This represents a sample of about 0.001 percent (1/10,000th) of all the soil upon which the home will rest.⁴⁵ Based on this sample of just 0.001 percent of the soil, and despite the knowledge that soil composition often is not uniform across a lot, the soils engineer will make foundation design recommendations, the structural engineer will design the foundation, and the builder will construct the foundation. (Typically, the only safety-valve in the process is the soils

engineer's recommendation that a soils engineer be present after the foundation excavation has begun to visually confirm that the exposed soil *appears consistent* with the tested soil.) Property owner counsel often argue that if such methodology is considered acceptable and cost-beneficial by the construction industry *for building homes*, analogous methodologies for evaluating the performance of constructed homes should be acceptable as well.

Similarly, the authors also have found that after questioning builders, general contractors and construction management companies regarding their quality control practices, nearly all testify that they do not employ a statistically valid sampling method when inspecting and approving for payment subcontractors' work. Instead, they conduct only as many inspections as their experience suggests is necessary to allow them to subjectively conclude that the work was done in substantial compliance with the plans, specifications and applicable building code.

Defective Condition Versus Legal Responsibility

In a typical construction defect negligence case, the homeowner must prove the breach of a legal duty of care, damages and a causal connection between the breach and claimed damages. Practically speaking, this burden is met upon proof of the existence of a defective construction element that is not reasonably suitable for its intended purpose; proof of the reasonable and necessary cost of remedying the defect and any resulting damage caused by the defect; and proof that the defect is the "responsibility of the individual defendant."⁴⁶

An extensive forensic investigatory record may easily support the reasonable inference that a builder-vendor is liable for breach of its implied warranties or non-delegable tort duty of reasonable care in constructing a home as to a particular defect. However, that same record may be inadequate to establish liability on the part of a specific subcontractor where multiple subcontractors were employed on a given project or, perhaps, even as to a single building within the project, and factual disputes exist as to who performed what work and precisely what work was required of the particular subcontractor. As to a specific subcontractor, the evidence must establish that the defect at issue and its alleged resulting damage is that subcontractor's individual responsibility.

The Colorado Supreme Court has said that, "[t]o impose an impossible or unreasonably onerous burden of proof is to deny many consumers a meaningful remedy."⁴⁷ *Prutch v. Ford Motor Co.* held that injustice would result from denying breach of warranty relief where one of several defendants in a product distribution chain was responsible for a farm machinery defect, but the plaintiff could not prove which one.⁴⁸ Noting that procedural rules governing burdens of proof are intended to "facilitate the truth-seeking process," the Court adopted a strict liability evidentiary methodology whereby each defendant was required to prove the product was not defective when it left its control, which procedure simply "redistributes the burden to those who have superior knowledge of the truth and better access to evidence."⁴⁹ Where a builder-vendor and several of its subcontractors share responsibility for ensuring the building wrap and flashings are properly applied, and instead they are found to be reverse-lapped, drawing water behind the building envelopes' moisture barrier, property owner counsel will argue that imposition of a burden of proof among those construction professionals who "have superior knowledge of the truth" and "better access to evidence" similar to that mandated by *Prutch* is proper, rather than requiring the property owner to entirely dismantle a structure to prove its case.

Does 'Extrapolation' Require 'Exceptional' Evidence?

Messrs. Perrone and Osias urge in *Is Expert Extrapolation in Construction Defect Cases Sufficiently Reliable?*⁵⁰ that using extrapolation evidence in multi-family residential defect cases is "not necessary" because "it is possible for experts to inspect and render a particularized opinion for each unit," and that extrapolated opinions may be improper because "each parcel of land is unique."⁵¹ However, as shown above, where the evidentiary record as a whole supports the reasonable inference that customary (but inadequate) construction methods were used or a negligent design employed, it may be appropriate for the fact finder to draw certain reasonable inferences about the whole of the construction based on an expert witness's observation of something less than the whole. Plaintiffs' counsel may bolster this conclusion by presenting evidence that the expert also relied on: (a) direct observations made by fact witnesses and/or other experts; (b) select intrusive examination and testing; (c) photographs; (d) valid and representative

statistical sampling; (e) other direct and circumstantial evidence; or (f) a combination of some of these or other means. These commentators' suggestion that a defective structure must be dismantled and each discrete, suspect component observed or tested before opinions regarding the pervasive presence of defects and resulting damage should be admitted seems too stringent a standard and may not be consistent with federal or most state evidentiary rules. While they are correct to note that "cost and convenience" alone cannot justify allowing inadmissible opinion evidence, the admission of extrapolated opinions need not be conditioned on "exceptional circumstances," as they suggest. Such evidence's admissibility must be gauged as any other evidence is gauged: against the applicable evidentiary rules.

Reliance on the old saw that all real property is unique may be proper when *establishing the market value* of parcels and real estate improvements,⁵² or seeking the *specific performance* of a purchase contract,⁵³ but the maxim offers little useful guidance in determining whether a construction defect that is the product of standardized, but improper, construction methods or an erroneous, underlying, repeated design is, more likely than not, present in all mass-produced living units built as part of an integrated construction effort.

Messrs. Perrone and Osias also rely on *dicta* from cases considering whether a court should properly certify construction-defect claims as a class action. These cases turn on satisfaction of the class action requirements of numerosity, commonality, typicality and representational adequacy, as well as the superiority and manageability of the class action device.⁵⁴ Examining one such case is illuminating.

In *Hicks v. Kaufman & Broad Home Corp.*, the court directed the class certification of express and implied warranty claims based on allegations that the foundations of 10,000 class members' homes "contain[ed] an inherent defect which [wa]s substantially certain to result in malfunction during the useful life of the product."⁵⁵ The court upheld the denial of certification of negligence and strict liability claims because these claims required proof of individualized damage, while the warranty claims merely required proof of a common defect — the alleged use of an inherently inadequate "[f]ibermesh, a polypropylene product," instead of "welded wire mesh" in constructing the

homes' foundations.⁵⁶ Hicks effectively held, based on the record before it, that an expert could properly extrapolate that all the homes' foundations were defective without examining each home because the identical design defect was allegedly present in each, but that expert testimony based on examination of each home likely would be required to establish that resulting injury-in-fact to each home was caused by the defect.⁵⁷

Reliance on analogies to cases addressing "extrapolation" in the context of blood-alcohol analysis and animal studies in tort litigation is not greatly helpful. In the blood-alcohol cases, courts find that the availability of corroborating evidence, such as slurred speech, bloodshot eyes and disequilibrium, can satisfy the evidentiary gap that may arise if one relies solely on mathematically extrapolating the driver's tested blood-alcohol level backwards in time.⁵⁸ This conclusion is consistent with the analogous view that an expert's direct observation of some construction defects, properly combined with corroborative circumstantial or inferential evidence of the wide-spread presence of such defects and resulting damage, may support some extrapolated opinions. Conversely, where the data upon which the extrapolated blood-alcohol opinion is drawn is virtually nonexistent and fails to supply the necessary technical foundation, the opinion may properly be excluded,⁵⁹ just as an expert's opinion in the construction context should be excluded if equally deficient.

Similarly, relying on the judiciary's well-founded hostility to extrapolating human drug reactions from animal studies is not particularly useful in evaluating the admissibility of extrapolation evidence in construction defect cases because of significant methodological differences between the medical and engineering disciplines, and the notoriously idiosyncratic interaction of drugs with human physiology versus the more predictable physics of (and abundant experience relating to) how structures react to loads, stress and the environment.

In sum, a Daubert-like analysis does not support a knee-jerk rejection of extrapolation evidence. Rather, the quality and quantity of the evidence upon which the expert relies need only be "based on sufficient facts or data" that is the "product of reliable principles and methods," coupled with a showing that the expert "has applied the principles and methods reliably to

the facts of the case."⁶⁰ A proper foundation for such analysis might begin by showing that extrapolation is used frequently in the construction and engineering fields. The court should be advised that use of the term "extrapolation" itself may be misleading. Defense counsel may intend the term to mean only a statistically valid sampling and analysis.⁶¹ However, plaintiff's counsel may intend the term to refer to expert opinions based on a reasonably thorough forensic investigation, coupled with other direct and indirect evidence gleaned from discovery, which, once combined with the expert's practical field experience, training and education, is sufficient to allow a jury to reasonably conclude that the expert's opinions regarding the existence of a defect or damage in locations he has not observed are, more likely than not, valid.

Motions *In Limine*: Practical Considerations

A motion *in limine*⁶² typically requests the trial court to make certain evidentiary rulings before trial. Such rulings often allow for more efficient trial preparation and can streamline and shorten the trial. Whether to admit or exclude evidence is left to the sound discretion of the trial court, and a verdict following such rulings will not be set aside unless it can be shown that the ruling substantially affected a party's right to a fair trial.⁶³ The Colorado Supreme Court has said that factors bearing on admissibility of evidence "can best be evaluated in the evidentiary state of the record at trial rather than in the artificial atmosphere of a pretrial motion."⁶⁴ From a practical standpoint, waiting until trial before ruling on a motion *in limine* directed at so-called "extrapolation evidence" may be a superior approach to resolving the motion in some cases.

First, the court may not be able to fully appreciate the voluminous evidence amassed by the forensic experts, nor how all the factual bases for the experts' opinions integrate with one another, until the evidence is presented in the crucible of trial. Extensive illustrative and "cut-away" exhibits depicting the construction elements and defects that are the subject of the motion, as well as the relevant construction sequence, often are not finalized until close to trial. Such exhibits may assist the court (and the jury) in understanding how things "came together" at the job site.

Second, if the *in limine* motion is intended to constitute a true Shreck-Daubert challenge to aspects

of the expert's testimony and the evidence his or her opinions rest on, often the most effective way to process such a challenge is during the course of his or her testimony. Taking time out for an extensive and separate Shreck-Daubert⁶⁹ hearing before trial, where a prima facie Shreck-Daubert challenge has not been clearly established, may result in a waste of court and jury time. Instead, the court may elect to allow the expert's testimony to proceed and the foundation for the expert's opinions to be laid. The expert then can explain in detail what his or her investigation consisted of and what other investigations he or she relied on. Then, before the expert renders his or her opinions, the court could consider any Shreck-Daubert challenge to relevant aspects of the expert's opinions outside the presence of the jury, if the challenge appears to have any merit and the court is inclined to hear further argument at that time.

The careful practitioner also should consider alternate grounds the record may afford for resisting a motion *in limine*. Thus, in the hypothetical building-wrap and flashing case described above, the record may establish that so much of the *exterior cladding* and associated flashings must be removed and replaced or repaired due to installation errors *regardless of the condition of the underlying building wrap*, that this process will necessarily damage the underlying building wrap, requiring the building wrap's removal and replacement in any event. Prudent property owner counsel, working closely with the property owners' experts, must spend the necessary time, money and effort before trial developing and documenting the evidentiary record supporting those conclusions. Defendant construction professionals and their experts' deposition testimony may help expand this record by showing that the proffered opinions are: (a) based on data and other information of a type reasonably relied on by other experts in the field; (b) experientially-based rather than the product of scientific study; and, (c) based on investigatory and inspection methodologies employed during the construction process and deemed reasonable by the construction industry.

Conclusion

The admissibility of construction defect opinions based either on mathematical or experiential extrapolation from known facts must be gauged against legal relevancy standards as expressed in the applicable rules of evidence. Because most construction defect

opinions are experientially-based, the trial court's gate-keeper function is served by examining the record as a whole and determining whether a reasonable juror, after viewing that record and all reasonable inferences to be drawn from that record in the light most favorable to the property owner, supports the property owners' experts' opinions, and that the expert holds those opinions within a reasonable degree of probability. Property owner counsel and their expert witnesses must spend the necessary time, money and effort before trial to develop and document the evidentiary record to support any opinions as to the "whole" of the structure drawn from direct examination of just "some" of its components.

Endnotes

1. Colorado has not adopted the most recent amendments to Federal Rule of Evidence 702. The Colorado Supreme Court has, however, embraced the "reliability" and "gatekeeping" aspects of Daubert v. Merrell Dow Pharmaceuticals, Inc., 509 U.S. 579 (1993), in People v. Shreck, 22 P.3d 68 (Colo. 2001).
2. *The American Heritage Dictionary of the English Language* (Houghton Mifflin Co., 4th ed. 2000).
3. See Polz v. Donnelly, 213 P.2d 385, 386 (Colo. 1949) (admissible evidence must provide a "basis for inferences" drawn by jury).
4. See C.J.I. Civ. 5:5 (4th ed. 2004); see also Logixx Automation, Inc. v. Lawrence Michels Family Trust, 56 P.3d 1224, 1227-28 (Colo. Ct. App. 2002) (fact of damage must be proven; fact finder to consider all the evidence); W. Conference Resorts, Inc. v. Pease, 668 P.2d 973, 977 (Colo. Ct. App. 1983) (law permits approximation of the amount of damages); Margenau v. Bowlin, 12 P.3d 1214, 1218 (Colo. Ct. App. 2000) (amount of damages need not be determined by mathematical formula).
5. See, e.g., Cerrone v. People, 900 P.2d 45, 54 (Colo. 1995) (relying on evidence "extrapolated from the statistical evidence that more persons with lower

- incomes were excluded," and "some correlation" between education and income, court affirmed finding of discrimination by State on basis of economic status in exclusion of low wage earners from grand jury); Peterson v. Ground Water Comm'n, 579 P.2d 629, 515 (Colo. 1978) (affirming denial of permit application to construct well based upon various hydrological estimates as to future rates of water depletion, even though "hydrograph evidence was not conclusive as to future experience," evidence admitted because it was "relevant"); Salazar v. Am. Sterilizer Co., 5 P.3d 357 (Colo. Ct. App. 2000) (in personal injury claim against manufacturer of sterilizing machine caused by exposure to ethylene oxide leaks, periodic sampling and reports of leaks used to prove fact of leaks and exposure to leaks). Many other cases allow a jury, with or without an expert's supporting testimony, to infer the existence of a larger set of facts from a much smaller subset of those facts
6. See C.J.I. Civ. 3:8 (4th ed. 2004); see also Quinrana v. Kudrna, 402 P.2d 927, 928 (Colo. 1965) (reasonable inferences properly deducible from circumstantial evidence will support a judgment based upon them); Miller v. Boma Inv. Co., 144 P.2d 988, 991 (Colo. 1944) (inferences to be drawn from circumstantial evidence and weight to be given to testimony are for jury to decide).
 7. See C.J.I. Civ. 3:8 (4th ed. 2004).
 8. See, e.g., Sentinel Mgmt. Co. v. Aetna Cas. & Sur. Co., 615 N.W.2d 819 (Minn. 2000); Consol. Elec. Distribs., Inc. v. Kirkham, Chaon & Kirkham, Inc., 95 Cal. Rptr. 673 (Cal. Ct. App. 1971); cf. Washington Courte Condo. Ass'n-Four v. Washington-Golf Corp., 643 N.E.2d 199 (Ill. Ct. App. 1994).
 9. Sentinel Mgmt., 615 N.W. 2d 819
 10. *Id.* at 823.
 11. *Id.*
 12. Consol. Elec. Distribs., 18 Cal. App. 3d 54.
 13. *Id.* at 60.
 14. *Id.* (emphasis added).
 15. Washington Courte Condo. Ass'n, 643 N.E. 2d 199.
 16. *Id.* at 809.
 17. See Anderson v. Combustion Eng'g. Inc., 647 N.W.2d 460, 465 (Wis. Ct. App. 2002) (jury "entitled to extrapolate" from testimony of plaintiff's working conditions in quantifying plaintiff's exposure to asbestos; requiring "daily log" of activities and exposures impossible and would place intolerable burden on those claiming similar injuries); United States Gypsum Co. v. Mayor of Baltimore, 647 A.2d 405, 423-24 (Md. Ct. App. 1994) (in upholding surface dust sampling to extrapolate asbestos contamination levels throughout building, court noted that sampling technique "not free from criticism," and despite no universally accepted protocol for sampling, scientific acceptance need not be universal in order to be considered generally accepted).
 18. United States v. Fior D'Italia, Inc., 536 U.S. 238 (2002).
 19. *Id.* at 248.
 20. Texaco, Inc. v. Hasbrouck, 496 U.S. 543 (2002).
 21. *Id.* at 572.
 22. *Id.* at 573.
 23. Gen. Elec. Co. v. Joiner, 522 U.S. 136, 145 (1997).
 24. See, e.g., Harbor House Condo. Ass'n v. Mass. Bay Ins. Co., 703 F. Supp. 1313 (N.D. Ill. 1988). See also Ayala v. Pardee Constr. Co., Nos. E028639 & E029242, 2002 WL 31160551 (Cal. Ct. App. 2002) (unpublished), concluding that without *any expert testimony* as to the foundation for and the reasonableness of arguing that problems with one mass-produced home probably afflicted second mass-produced home, the second home's owners could not meet their burden of proof and their defect claims were properly dismissed. The preclusion order also found that the second home's owners' counsel repeatedly failed to timely and properly designate expert witnesses, and engaged in deliber-

- are "gamesmanship" in failing to disclose required information. *Id.* at *6. The one expert homeowners arguably endorsed testified that homeowners "had not retained him, he had not inspected their homes, and he had no opinions about their homes." *Id.* at *10.
25. Harbor House Condo. Ass'n, 703 F. Supp. 1313.
 26. *Id.* at 1317.
 27. *Id.* at 1320.
 28. See, e.g., Order, Canyon Ranch Condo. Ass'n, Inc. v. Canyon Ranch Condos., LLLP, No. 98 CV 545 (Douglas County Dist. Ct. June 29, 2001) ("extrapolation should not be used to argue that physical damage exists when such physical damage can be verified through simple inspection"; court would not allow "conjecture using a simple mathematical formula and not an opinion based on special knowledge"); Order, Village II Homeowners Ass'ns Inc., No. 98-CV-1862 (Boulder County Dist. Ct. Jan. 11, 2001) (denying motion for admission of extrapolation evidence based on Colorado Rule of Evidence 403; no discussion of procedural posture or facts); Order, Foothills at Cheyenne Autumn Condo. Ass'n, No. 98-CV-3354 (El Paso County Dist. Ct. Mar. 17, 2000) (finding Plaintiff's unit defect disclosures inadequate due to failure to identify specific locations of claimed defects observable and/or identifiable by inspection and testing, and extrapolating unspecified portions of property on basis of samplings from specific unit defects that would have been clearly observable and/or identifiable by inspection and testing); Order, Glenborough Condo. Ass'n, Inc. v. Century Contractors, Inc., No. 99-CV-5389 (Denver County Dist. Ct. Oct. 25, 2001) (rejecting expert opinions based on methodology of inspecting "small number of units, then projecting the observed percentage of defects to total number of units").
 29. See, e.g., Order, Terrace at Columbine II v. Vision Homes, Inc., No. 99 CV 2632 (Jefferson County Dist. Ct. Mar. 20, 2001) (holding "extrapolation is not a novel scientific principal," and "[i]n general extrapolation testimony should be admissible so long as a proper foundation is established."); Order, Village II Homeowners Ass'n, Inc., No. 98-CV-1862-2 (Boulder County Dist. Ct. July 26, 2000) ("As a matter of general principle, the Court is not opposed to extrapolation of evidence"); Order, Kentucky Ridge Townhomes Homeowners' Ass'n, Inc. v. Kentucky Ridge Investors, Ltd., No. 99 CV 2239 (Arapahoe County Dist. Ct. Aug. 13, 2003) (finding "extrapolation evidence is reasonably reliable, if properly done," and both sides' experts agree that "extrapolation is a method relied on . . . to determine the extent of defects without having to check every location."); The Ponds at Blue River Homeowners Ass'n, Inc. v. Ponds at Blue River Ass'ns, LLC, No. 03 CV 35, Transcript at 143-46 (Summit County Dist. Ct. Aug. 22, 2005) (where expert opinions based on "sampling," "trier of fact to determine whether that sampling, along with all of the other evidence . . . is sufficient to establish by a preponderance that there are defects throughout the property itself").
 30. See Shreck, 22 P.3d 68.
 31. *Id.* at 70.
 32. *Id.* at 75.
 33. An extreme example helps underscore this point: how many misinstalled, leaking natural gas fittings concealed within an apartment building's walls must an expert uncover before an opinion that invasive cuts must be made into every wall to allow the inspection of all 150 fittings becomes admissible?
 34. *Id.* at 78 (citations omitted).
 35. Cosmopolitan Homes, Inc. v. Weller, 663 P.2d 1041, 1045 (Colo. 1983).
 36. Am. Employer's Ins. Co. v. Pinkard Constr. Co., 806 P.2d 954 (Colo. Ct. App. 1990).
 37. *Id.* at 955 (emphasis added).
 38. Construction professional counsel argue that such "limited" intrusive investigations must be representative, often urging that they must constitute a random and representative sampling sufficient in number to allow conclusions to be drawn within an acceptable "level of confidence" using statistical analysis. Property owner counsel respond that, in

- practice, large buildings or projects typically are not built such that scientifically valid statistical studies can be achieved easily. For example, each side of a structure faces a different direction and, as a result, is subject to different environmental conditions such as thermal changes, wind loads and moisture exposures, resulting in differential weathering and performance. Property owner counsel urge that no peer-reviewed, published scientific studies exist or are likely ever to be made of the differing effects of these environmental conditions because of the many variables, yet both property owner and construction professional experts often express a high degree of confidence rendering experience-based opinions relating to such weathering and performance issues.
39. Colo. Rule Evid. 703.
 40. See Colo. Rule Evid. 406.
 41. C.J.1. Civ. 3:8 (4th ed. 2004).
 42. The parties' experts disagreed whether removal and replacement of all 400 windows was the proper repair or whether squirting sealant around each window perimeter would do the trick.
 43. This example simplifies things by ignoring the fact that soils adjacent to the footprint as well as below this 15 foot depth likely will influence the home's foundation's performance as well.
 44. Sometimes, the sample is actually taken only from outside the home's "footprint."
 45. Actually, the sample size is *considerably* smaller, since only two or three "discs" of soil sliced from the column are sampled, not the entire bored sample.
 46. Cosmopolitan Homes, 663 P.2d at 1045.
 47. Prutch v. Ford Motor Co., 618 P.2d 657, 660 (Colo. 1980).
 48. *Id.*
 49. *Id.* at 660.
 50. Perrone and Osias, *Is Expert Extrapolation in Construction Defect Cases Sufficiently Reliable?*, Mealey's Litigation Report: Construction Defects, Vol. 7, Iss. 3 (April, 2006), at 28.
 51. *Id.*
 52. But see Shampton, *The Use of Statistical Inference to Establish Severance Damages in Condemnation Cases*, 2 Tex. Wesleyan L. Rev. 429, 439 (1996) (questioning the continuing validity of the maxim).
 53. But see Centex Homes Corp. v. Boag, 320 A.2d 194, 198 (N.J. Super. Ct. Ch. Div. 1974) (denying specific performance for breach of sales agreement: "condominium apartment unit has no unique quality but is one of hundreds of virtually identical units"; "units are sold by means of sample, in this case model apartments, in much the same manner as items of personal property are sold . . . the only variance as between apartments having the same floor plan (of which six plans are available) is the floor level or the building location within the project. In actuality, the condominium apartment units, regardless of their realty label, share the same characteristics as personal property").
 54. In Colorado, and in other states that have adopted similar portions of the Uniform Common Interest Ownership Act, a homeowners association may sue in its own name "on behalf of itself or two or more unit owners" on "matters affecting the common interest community." See Yacht Club II Homeowners Ass'n, Inc. v. A.C. Excavating, 94 P.3d 1177, 1179 (Colo. Ct. App. 2003), *aff'd*, 114 P.3d 862 (Colo. 2005) (construing C.R.S. § 38-33.3-302(1)(d)). This standing rule paves the way for a homeowners association to assert claims on behalf of hundreds of unit owners arising from common construction errors. Of course, standing to bring such suits does not, in and of itself, bridge the evidentiary gap between what is claimed and what needs to be proven to support such claims.
 55. Hicks v. Kaufman & Broad Home Corp., 107 Cal. Rptr. 2d 761, 768 (Cal. Ct. App. 2001).
 56. *Id.* at 764.
 57. In Shuette v. Beazer Homes Holdings Corp., 124 P.3d 530 (Nev. 2005), another class action case, the proposed representative plaintiffs alleged, *without*

submitting any proof, that alleged expansive soils problems involving 206 homes were the same, and the trial court certified these claims, along with claims involving thirty other types of construction defects, for class action treatment. In reversing the trial court's certification order, the Shuette court noted that the plaintiffs admitted:

the houses were constructed in different phases, under different plans, and with at least two separate slab designs, and they did not show that each of the houses suffered from the same design or constructional flaw or were affected by the expanding soils in the same way. Further, the record contains evidence indicating that the houses' underlying soils required different levels or types of preparation.

Id. at 545. Shuette observed, however, that, "Class action treatment may be proper . . . if the constructional defect case or issue involves a singular defect that predominates over any other problems" *Id.* at 544.

In Colorado, narrowly focused claims involving the alleged use of a defective flooring system over expansive soils in over 900 homes were certified for class treatment and tried on this basis, with a resulting liability verdict for the plaintiffs. See Peterson v. Mission Viejo Co., No. 92CV568 (Douglas County Dist. Ct.), petition for immediate review dismissed, No. 95SA191 (Colo. June 22, 1995). In Peterson, the plaintiffs contended that the use of a slab-on-grade flooring system rather than a structurally supported floor over expansive soils in areas intended to be suitable for finishing was improper. The trial court permitted the jury to consider this claim on a class basis in light of evidence that the builder decided which flooring system to use based on four expansive soil "risk" categories with which the builder characterized each lot, *i.e.*, low, medium, high and very high. In response to special interrogatories, the jury concluded it was improper to use the slab-on-grade floor as to each of the four risk categories. The case settled before individual trials on causation, damages and affirmative defenses occurred.

58. Commonwealth of Pennsylvania v. Sullivan, 864 A.2d 1246 (Pa. Super. Ct. 2004).

59. State v. Wolf, 605 N.W.2d 381 (Minn. 2000).
60. See Fed. Rule Evid. 702.
61. On this point, the authors' and Messrs. Perrone and Osias's views may converge. Establishing the necessary foundation for a valid statistical analysis involves many challenges, including identifying reasonably random samples, establishing that the samples are representative, and then drawing appropriate conclusions from those samples within a reasonable degree of probability. The proverbial "tear-down" suit alluded to in *Is Expert Extrapolation in Construction Defect Cases Sufficiently Reliable?* at endnote 1 is particularly problematic when evaluated against such a statistical standard. Such suit is typically based on tearing down the interior drywall and exterior cladding on a single multi-family living unit, identifying defects and damage in the exposed construction elements, and then having expert witnesses "extrapolate" from this evidence that all units "probably" suffer from the same defect and damage. See also discussion of statistical sampling in note 38, *supra*.
62. See Colorado Rules of Evidence 104 and 105; see also Good v. A.B. Chance Co., 565 P.2d 217 (Colo. Ct. App. 1977) (court has inherent power to pass on admissibility). While a party may be required to renew its objection to evidence that is the subject of a motion *in limine* during the course of trial, where "a specific evidentiary issue is presented to the trial court in advance of trial, the primary purposes of the contemporaneous objection rule — to permit the trial court to accurately evaluate the legal issues and to enable the appellate court to apprehend the basis of the objection — are satisfied," and requiring "an additional formal objection and ruling in all cases would undermine the benefits provided by the motion *in limine* procedure." Uprain v. Huntington Lab. Inc., 723 P.2d 1322, 1330 (Colo. 1986).
63. See Plank and Gill, Colorado Appellate Law §§ 18.8 & 18.9 (1999).
64. Higgs v. Dist. Ct., 713 P.2d 840, 859 (Colo. 1985).
65. Shreck, 22 P.3d 68. ■