



# WHEN PROFESSIONAL ENGINEERING SERVICES GO AWRY

BY RICHARD T. REDANO, J.D., NORTH CAROLINA ALPHA '78

Above Image: Kinokawa River, Musota, Wakayama, Japan - Circa October, 2021

## AN INTRODUCTION TO ENGINEERING MALPRACTICE LITIGATION

For over four decades, the author has read articles in *The Bent* exploring the wonderful contributions that engineers have made to society through innovation and technological advancement. Unfortunately, not all engineering endeavors have a happy ending. Sometimes engineering design errors occur that can give rise to a lawsuit (litigation) for engineering malpractice. The purpose of this article is to provide an overview of potential liability resulting from negligent engineering services. The primary focus here is engineering malpractice litigation, including the elements of a malpractice claim, the type of expert testimony often needed, and the potential financial impact (awardable damages).

## THE ELEMENTS OF A MALPRACTICE CLAIM

The discussion of engineering malpractice in the article applies to situations where the federal government is not involved (Limited Scope Provision). Legal claims fall into two general categories: contract and tort. *Merriam Webster's Dictionary* defines **tort** as “a wrongful act other than a breach of contract for which relief may be obtained in the form of damages or an injunction.” An **injunction** is a court order commanding a party to take certain action (e.g. stop using a specific trademark).

Professional malpractice claims are negligence based. *Merriam Webster's Dictionary* defines **negligence** as “failure to exercise the care that a reasonably prudent person would exercise in like circumstances.” In engineering malpractice cases, the relevant standard for evaluating negligence is that of the

reasonably prudent engineer. In a malpractice tort claim, the plaintiff bears the burden of proving:

- the professional who provided services owed the plaintiff a duty to act with the reasonable standard of care for that profession;
- the professional breached that duty;
- the breach of that duty caused the plaintiff to incur damages; and
- the damages incurred are compensable.

A **contract** is a binding agreement between two or more persons that may be written or oral. Where there is a contract for professional services, the party claiming to be injured by professional negligence often brings a breach of contract claim on theories such as failing to receive the benefit of the bargain or the professional's failure to meet contract specifications.

## WHOSE LAW CONTROLS THESE CLAIMS?

An initial issue to address in any legal controversy is: Whose law controls? Subject to the previously defined Limited Scope Provision, contract claims and malpractice tort claims are controlled by state law; however, they may be litigated in state or federal court, depending on factors beyond the scope of this article. A state or federal court will normally apply the law of the state in which suit is brought for a state law claim. An exception to this general rule is where there is a Choice of Law provision specifying whose law controls. Courts may ignore such provisions, but are unlikely to do so where a party to the contract has a relationship to the state whose law is chosen.

## CERTIFICATE OF MERIT — A HIRED GUN NEUTRALIZER

While malpractice litigation occurs in courts, the judicial branch of government is not the only branch involved in this area. State legislatures have enacted measures intended to limit perceived abuses in malpractice litigation. Professional societies advocate for their members in lobbying state legislatures to enact such measures. Thus, be active in your professional society.

Readers old enough to have mastered the slide rule may remember the early 1960s TV show *Have Gun – Will Travel*. By the 1970s, expert witnesses had emulated that show's gunslinger hero Paladin, with a minor modification to their business cards: *Have CV – Will Travel*. Professional societies complained to state legislatures about "hired gun" experts shipped in from large cities in distant states to opine on behalf of plaintiffs in malpractice cases. This practice was most prevalent in medical malpractice, resulting in several states requiring an expert to be licensed in the locality where the defendant practiced medicine.<sup>1</sup> This was the forefront in a legislative effort to curb perceived abuses in professional malpractice litigation.

For engineering malpractice cases, several states enacted Certificate of Merit requirements to reduce the incidence of frivolous malpractice claims.<sup>2</sup> Unfortunately, there are "experts" who will provide "made to order" opinions

regardless of the facts. The Certificate of Merit requirement is aimed at ensuring more competent expert testimony in engineering malpractice cases.

We will examine Texas' Certificate of Merit requirement as a representative example.<sup>3</sup> Texas law mandates the filing of a Certificate of Merit contemporaneously with the filing of a complaint seeking "damages arising out of the provision of professional services" by a licensed or registered professional engineer as follows:

*[T]he claimant shall be required to file with the complaint an affidavit of a third-party licensed professional engineer who [1] is competent to testify, [2] holds the same professional license as the defendant, [3] practices in the area of practice of the defendant, and [4] offers testimony based on the person's (A) knowledge, (B) skill, (C) experience, (D) training, and (E) practice.*

*The affidavit shall set forth specifically for each theory of recovery for which damages are sought, [5] the negligence, if any, or other error, or omission of the licensed or registered professional in providing the professional service, including any error or omission in providing advice, judgment, opinion, or a similar professional skill claimed to exist, and [6] the factual basis for each such claim. [7] The third-party professional engineer shall be licensed or registered in this state and [8] actively engaged in the practice of engineering.*<sup>4</sup>

The above requirements impose a substantial barrier to frivolous engineering malpractice claims. This Certificate of Merit is required, not only in malpractice cases, but also in any case where the plaintiff seeks to recover damages arising out of the provision of professional services enumerated in the statute.

Consider the Texas registered professional engineer who performed bridge structural analysis for 30 years, retired, and one year into her retirement is asked to provide expert testimony on behalf of a plaintiff in a Texas engineering malpractice case regarding a bridge's structural failure. While she may be eminently qualified to provide such testimony from a technical perspective, she is arguably<sup>5</sup> not "actively engaged in the practice of engineering," as required by item [8], above.

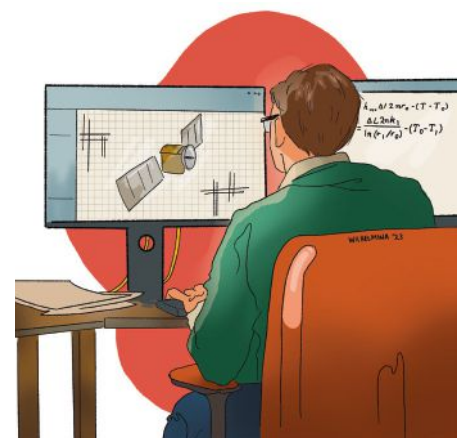
The Texas Supreme Court dismissed a case where the plaintiff conflated Certificate of Merit requirements [2] and [3].<sup>6</sup> The plaintiff argued that it could be inferred that the expert practiced in the same area as the defendant from the fact that the expert held the same license as the defendant. The Texas Supreme Court rejected this argument, holding:

*We conclude then that the statute's knowledge requirement is not synonymous with the expert's licensure or active engagement in the practice; it requires some additional explication or evidence reflecting the expert's familiarity or experience with the practice area at issue in the litigation. Here, we have no such evidence.*<sup>7</sup>

Returning to our previously discussed Texas bridge malpractice case, assume that the defendant who performed the original structural analysis holds a Texas P.E. registration in mechanical engineering, and the plaintiff submits an affidavit from an expert with the same P.E. registration who has designed heat shielding for NASA spacecraft his entire career. That affidavit would fail to meet the aforementioned requirement [3].

## EXPERT TESTIMONY REGARDING STANDARD OF CARE

Expert testimony is usually, perhaps even always, required in a professional malpractice case regarding the standard of care applicable to the professional services in question. In *Criterium-Farrell Engineers v. Owens* (the *CFE* case), a Texas appeals court held that the Certificate of Merit "must necessarily address the applicable standard of care





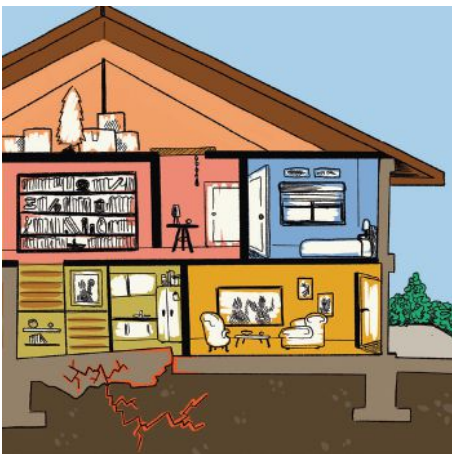
and the defendant's failure to meet the standard" because "negligence is conduct that falls below the applicable standard of care." (See aforementioned requirement [5])<sup>8</sup>

In the *CFE* case, the plaintiffs hired engineering firm Criterium-Farrell Engineers (CFE) to perform a structural inspection of a house that the plaintiffs wished to purchase. A CFE engineer inspected the house and issued a report finding the house to be "structurally sound" with "no major structural problems." The plaintiffs purchased the home, noticed some defects, and had CFE perform a second inspection. CFE issued a second report stating "we observed a high spot on the floor on the left side of the game room."<sup>9</sup>

The plaintiffs then had the house inspected by other licensed structural engineers who discovered foundation problems, structural defects, failed attempts at remediation, and attempted concealment of the defects. The plaintiffs sued CFE, the sellers of the residence, the home's builder, and the home warranty provider. The claims asserted by the plaintiffs included breach of contract and negligence.

Note the plaintiffs sued everyone involved in this transaction. This is common and usually prudent at this stage of litigation under similar circumstances. It benefits a plaintiff to involve as many "deep pockets" as possible. The deep pockets include the parties sued and their insurance carriers. A plaintiff wants to wait for defendants to point their fingers at each other.

Initially undetected cracks in the foundation



While the *CFE* case deals with a house, one can easily extrapolate this situation to a larger project, such as the litigation arising from the June 2021 collapse of the Champlain Towers South in Surfside, FL. The defendants in the Champlain Towers litigation included the developer, contractor, condo association, and several engineering firms.<sup>10</sup>

In support of their negligence claims, the plaintiffs in the *CFE* case submitted a Certificate of Merit affidavit from Texas registered structural engineer Gary Boyd detailing his inspection of the house and his review of CFE's reports.<sup>11</sup> Mr. Boyd's affidavit stated:

- a. CFE's inspector erred in measuring the first floor elevation;
- b. had CFE's engineer accurately measured the slope, then he would have concluded repairs were warranted by CFE's own reported standards;
- c. CFE omitted an inspection of the residence's second floor, which should have been performed; and
- d. had the second-floor inspection been performed, then a prudent engineer would have discovered the excessive slope.<sup>12</sup>

CFE filed a motion to dismiss the negligence claims, arguing that Mr. Boyd's affidavit did not meet the statutory requirements for a Certificate of Merit in Texas.<sup>13</sup> The trial court denied this motion. The appeals court affirmed this ruling, holding that the Boyd affidavit complied with those statutory requirements.<sup>14</sup>

## PROOF REQUIRED TO RECOVER MALPRACTICE DAMAGES

Last, but not least, in the elements of a malpractice claim, is damages. Under basic common law principles, the plaintiff in a malpractice case may recover all damages proximately caused by the defendant's negligence.<sup>15</sup> Proximate cause, comprises two elements: (1) causation in fact, and (2) foreseeability.<sup>16</sup>

Causation in fact "requires proof that an act or omission was a substantial factor in bringing about injury, which would not otherwise have occurred."<sup>17</sup> Assume that an engineer designs a boiler with a pressure relief valve (PRV) actuated by

a pressure sensor. Unfortunately, the design temperature in the boiler room exceeded the recommended operating temperature for the pressure sensor, as stated in its specification. This resulted in boiler over-pressurization and an explosion that damaged equipment. This is an example of causation in fact.

Assume the same boiler and pressure sensor design with these additional facts. Someone inadvertently injected a highly volatile compound into the boiler that exploded at the boiler's design temperature, below the opening setpoint of the PRV. In this scenario, the negligent design of the pressure sensor does not meet the causation in fact requirement, because the boiler would have exploded anyway (i.e. in legal lingo, there is not "but for" causation).

Foreseeability exists "when the actor as a person of ordinary intelligence should have anticipated the dangers his negligent act creates for others."<sup>18</sup> A structural engineer who errs in his load calculations for a parking garage should anticipate a collapse of the parking garage from such an error. Alternatively, assume that negligently designed circuitry for an auto's check engine light results in the light coming on and the driver pulling into a service station while an armed robbery is occurring. The driver is shot during this robbery. This gunshot injury is not a foreseeable result of the negligently designed circuitry.

## POTENTIAL MAGNITUDE OF MALPRACTICE DAMAGES

As previously mentioned, claims arising from negligent engineering services may be brought as contract or tort claims. A complex legal doctrine (The Economic Loss Doctrine) may limit the categories of damages available, depending on the type of legal claim asserted and/or who asserts it.<sup>19</sup> Depending on how courts apply this doctrine, some of the damage categories in the examples below may not be available to certain plaintiffs.

In the Champlain Towers condo collapse litigation, the engineering firm hired to inspect the tower for its 40-year recertification settled for \$16 million and the consulting structural engineering firm settled for \$8.55 million.<sup>20</sup> The amount of a settlement is usually proportional to, and discounted from, one's damage exposure.

In September 2021, the estimated cost of the I-69 Ohio River Crossing bridge project was \$1.27 billion.<sup>21</sup> The Federal Highway Administration estimated that the Gordie Howe Int'l bridge from Detroit to Windsor, Ontario, will cost \$4.4 billion.<sup>22</sup> Costs exceeding one billion dollars for new major bridge projects are common. Where an engineer's negligent design results in a bridge collapse, the available damages may include the cost of bridge repair or replacement and personal injury for any victims of the collapse. While the consulting engineer who designed the bridge may owe a duty to only the bridge owner, that owner likely would seek reimbursement (indemnification) from the consulting engineer for the third party claims against the owner, arising from the collapse. Such damages could exceed one billion dollars.

The natural gas liquification facility in Freeport, TX, is estimated to be worth \$14 billion.<sup>23</sup> Assume that an engineer's negligent design of an LNG liquification facility resulted in a major explosion and resulting eight-month shutdown. The resulting damage recovery may include cost of equipment repairs or replacements, related engineering costs, and lost profits. This liability could exceed one billion dollars.

The author is hopeful that the above discussion of damages will motivate any consulting engineers reading this article to ask themselves whether they are:

- a. carrying sufficient malpractice or errors & omissions insurance; and;
- b. adequately evaluating the liability exposure in the engagements they undertake.

Each of those questions is sufficiently complex to merit its own article in *The Bent*.

## COMMON PRACTICES TO LIMIT LIABILITY

Consulting engineers routinely provide services pursuant to a written contract. A prudent engineer will include clauses precluding consequential damages and requiring indemnification of the engineer by the client. Additionally, the prudent engineer will not sign a contract obligating the engineer to defend, indemnify, or hold harmless, anyone else.<sup>24</sup>

Even with a well written contract, an engineer will face some potential liability, often in an amount that exceeds the income derived from providing services. One of the best ways to limit liability that the engineer must personally satisfy is having malpractice or errors & omissions insurance. An important benefit of such coverage is the cost of defense, which can run several hundred thousand dollars in complex cases.

## THE RELATIVE SOCIAL IMPORTANCE OF ENGINEERING

How do the professions of medicine, law, professional engineering, and public accounting rank in importance to society? If television were the decisive factor in deciding this question, then medicine and law would be the two most important professions. Professional engineering and public accounting would be distant finishers. When is the last time you watched a TV show that focused on engineers or accountants?

Suppose that instead of TV, we based our answer to the above question on the magnitude of liability for professional negligence that reasonably could be envisioned for each of these professions. In that case, public accounting and engineering would be first and second, law would be third, and medicine would be a distant fourth.

Let us first consider public accounting. The companies in the S&P 500 have a total market capitalization of approximately \$33.3 trillion.<sup>25</sup> Thus, the average market cap of an S&P 500 company is approximately \$66.6 billion. An auditing error by a public accounting firm can easily cause a publicly traded company to lose 10 percent of its value. Thus, the annual audits of the S&P 500 companies provide several hundred opportunities for public accountant firms to incur billions of dollars in malpractice liability.

As discussed in the above section, professional engineers can face liability in excess of a billion dollars arising out of negligent designs for structures as common as bridges. For more expensive industrial facilities, the liability can be higher.

Let us next consider law. Legal malpractice can arise in many ways from document drafting errors (inoperative

will), erroneous legal advice (incompetent noninfringement opinion), or litigation errors (filing suit after the statute of limitations expired). A May 2022 article in *law.com* reported survey results of 11 legal malpractice insurers regarding their highest payouts to resolve claims. The highest reported payouts were described as over \$300 million,<sup>26</sup> which strongly indicates that they were under \$400 million.

In an article entitled "Top 10 Medical Malpractice Settlements in the United States in 2020" from *Top Verdict*, the highest settlement amount listed was \$20.1 million.<sup>27</sup> While one can find reports of jury verdicts or settlements in medical malpractice cases exceeding \$50 million, they are rare.

Liability is proportional to value. Rather than being dismayed by the above discussion of potential damage for engineering malpractice, recognize it as a testament to the importance of the engineering profession!

## CONCLUSION

Our legal system is periodically recalibrated to achieve a balance between ensuring that (a) those injured by engineering malpractice are adequately compensated, and (b) the incidence of frivolous engineering malpractice claims is minimized. The author hopes that this article has provided the reader with an enhanced understanding of how this system deals with engineering malpractice, the potential liability resulting from it, and how to mitigate liability exposure from such claims. For those interested in reading case studies of engineering design failures, the author highly recommends *Humble Pi: When Math Goes Wrong In The Real World* by Matt Parker.

.....  
**RICHARD T. REDANO** holds a B.S. in nuclear engineering (NC State Univ.) and a J.D. from the Univ. of TN College of Law. He is a licensed attorney in Texas, a registered patent attorney, and was a licensed P.E. in Texas. He held positions as a nuclear engineer & reactor inspector with the US-TVA and the US-NRC, respectively. Richard practiced intellectual property law in Houston for 26 years prior to his retirement in 2011. He now serves as a Director of the TBII Great Smoky Mountains Alumni Chapter.

See Works Cited on page 20.

## Spring Problems *Continued*

### BONUS: Integers

How many positive integers  $N$  less than or equal to 10,000 have the property that  $2^N - N^2$  is divisible by 7 with no remainder?

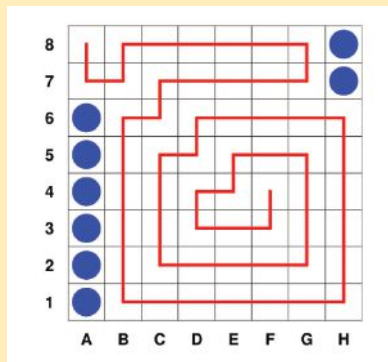
—*Challenging Mathematical Problems with Elementary Solutions*  
by A.M. & I.M. Yaglom

### DOUBLE BONUS

A rook is placed on an unoccupied square of a chessboard where some of the squares are already occupied as shown right. The rook then moves until all unoccupied squares have been visited exactly once. As an example, the figure includes a 23 move path starting at A8 and ending at F4. This is not the most efficient path for a rook starting at A8 to visit all unoccupied squares.

For an optimal starting square, what is the fewest number of moves such that every square is visited exactly once? Which row or rows (1 through 8) have no starting square that can achieve that minimal number of moves?

—**Timothy J. Slegel, PA A '80**



Email your answers (plain text only) to any or all of the Spring Brain Ticklers to [BrainTicklers@tbp.org](mailto:BrainTicklers@tbp.org) or by postal mail to **Dylan Lane, Tau Beta Pi, P.O. Box 2697, Knoxville, TN 37901-2697.**

The method of solution is not necessary. The Double Bonus is not graded. Where possible, exact answers are preferable to approximations. The cutoff date for entries to the Spring column is the appearance of the *Summer Bent* which typically arrives in mid-June (the digital distribution is several days earlier). We welcome any interesting problems that might be suitable for the column. Dylan will forward your entries to the judges who are **F.J. Tydeman, CA A '73**; **J.C. Rasbold, OH A '83**; **J.R. Stribling, CA A '92**; and the columnist for this issue,

— **G.M. Gerken, CA H '11**

## Works Cited continued from page 17 — **When Professional Engineering Services Go Awry**

- For example, Tennessee requires experts in medical malpractice cases to be "licensed to practice in the state or a contiguous bordering state a profession or specialty which would make the person's expert testimony relevant to the issues in the case." TCA 29-26-115(b).
- This article's reference to "frivolous" malpractice claims is not meant to suggest that meritorious malpractice claims do not exist.
- Texas was selected because (1) its economy employs many engineers, (2) the author is a licensed attorney in Texas, and (3) the author has held a P.E. license in Texas. Other states with similar statutes include Georgia, Delaware, Michigan, New Jersey, New York, Ohio, and Pennsylvania. *Sharp Engineering et al. v. Luis et al.*, 321 S.W. 3d 748, 755 fn. 11 [Tex. App. – Houston [14th Dist.] 2010, no pet.]
- Tex. Civ. Prac. & Rem. Code Ann. § 150.002(a) [Vernon Supp. 2009] This statute also applies to claims seeking damages arising out of professional services by architects, landscape architects, and land surveyors. The discussion in this article is limited to this statute's application to professional engineers.
- Subjective terms such as "actively" leave room for lawyers to argue about what minimum level of work is necessary to meet this ambiguous requirement.
- Levinson Alcoser Assoc. LP et al. v. El Pistolon II Ltd.*, 513 S.W.3d 487, 494 (Tex. 2017)
- Id.*
- Criterium – Farrell Engineers v. Owens*, 248 S.W. 3d 395, 400 [Tex. App. – Beaumont 2008, no pet.]
- Id.* at 396.
- The Real Deal*; <https://therealdeal.com/miami/2022/01/04/surfside-collapse-defendants-deflect-responsibility-in-new-court-docs/>
- 248 S.W. 2d at 397.
- Id.* at 400.
- Id.* at 396.
- Id.* at 400.
- Claims Against Architects and Engineers – New York Law Journal* (Sept. 21, 2021) ("Generally speaking, all damages which naturally flow from the malpractice of an A/E are recoverable, subject to any contractual limitations.")
- Farley v. M. M. Cattle Co.*, 529 S.W. 2d 751, 755 (Tex. 1975)
- Prudential Insurance Co. v. Jefferson Assoc.*, 896 S.W. 2d 156, 161 (Tex. 1995)
- El Chico Corp. v. Poole*, 732 S.W. 2d 306, 313 (Tex. 1987)
- Sharyland Water Supply Corp. v. City of Alton*, 354 S.W. 3d 407, 409 [Tex. 2011]; *LAN/STV v. Martin K. Eby Const. Co. Inc.*, 435 S.W. 3d 234, 245 [Tex. 2014]
- WESH Channel 2; [www.wesh.com/article/surfside-condo-collapse-tentative-settlement/39375498](http://www.wesh.com/article/surfside-condo-collapse-tentative-settlement/39375498)
- I-69 Ohio River Crossing Project Initial Financial Plan, Section 3.2 at p. 9 (Sept. 2021)
- [www.fhwa.dot.gov/ipd/project\\_profiles/mi\\_gordie\\_howe\\_int\\_bridge.aspx](http://www.fhwa.dot.gov/ipd/project_profiles/mi_gordie_howe_int_bridge.aspx)
- [www.constructiondive.com/news/ferc-approves-fourth-train-at-14b-freeport-lng-terminal/555320/](http://www.constructiondive.com/news/ferc-approves-fourth-train-at-14b-freeport-lng-terminal/555320/)
- Sources for suitable clauses are the engineer's insurance carrier, and an attorney experienced in representing engineers.
- [www.slickcharts.com/sp500/marketcap](http://www.slickcharts.com/sp500/marketcap)
- LAW.COM; [www.law.com/americanlawyer/2022/05/24/legal-malpractice-payouts-reach-all-time-high-firm-insurers-planning-premium-hikes/](http://www.law.com/americanlawyer/2022/05/24/legal-malpractice-payouts-reach-all-time-high-firm-insurers-planning-premium-hikes/)
- <https://topverdict.com/lists/2020/united-states/top-10-medical-malpractice-settlements>