



FROM THE CODE OF HAMMURABI TO CURRENT CALIFORNIA LEGAL PRECEDENT: SATISFYING ETHICAL DUTIES OF DESIGNERS

C. L. Perry⁽¹⁾, E. A. Fierro⁽²⁾, M. N. White⁽³⁾

⁽¹⁾ Principal, BFP Engineers, Inc., clp@bfpeq.com

⁽²⁾ Principal, BFP Engineers, Inc., efa@bfpeq.com

⁽³⁾ Principal, Law Offices of Mark N. White, mark.white@mnwhitelaw.com

Abstract

Engineers' conceptions of their responsibilities to their clients, third parties, and the public at large have evolved concurrently with the evolution of civilization itself. Engineers have long recognized that by satisfying their professional responsibility to avoid foreseeable harm to clients and others, they can avoid the legal consequences of failing to satisfy that fundamental duty. Recognition of this basic dynamic is partly the result of legal codes which have long made explicit the serious consequences of failing to protect the life and safety of the client. The Code of Hammurabi, dating from 1754 B.C., is an early example of the breach of duty dynamic: it dictates that a builder will receive the death penalty if the residence that he builds collapses and kills the owner.

As civilization matured and evolved from the time of Hammurabi, subtle and not-so-subtle changes have been made to the breach of duty dynamic. Aside from the death penalty, the designer (and/or builder) (currently one or more institutions) faces other legal consequences if the structure it designed (and/or constructed) collapses during a foreseeable earthquake. As an example, ASCE 7-10 has reshaped the standard of performance that the structural consultant has a duty to deliver. Its commentary states that the performance target for Risk Category II facilities is (i) a 10 percent probability of collapse and (ii) a 25 percent probability of serious personal injuries, including fatalities, during a Maximum Considered Earthquake (MCE). Application of the simple breach of duty dynamic from the Code of Hammurabi would require the imposition of the most serious sanctions if a Risk Category II structure built in accordance with ASCE 7-10 in fact caused collapse and fatalities during a foreseeable MCE—in fact, if the design and construction met rock-bottom minimum code requirements for Risk Category II and was subjected to an MCE, the design professional would face a 25 percent chance of defending against charges requiring the most serious civil and criminal legal penalties, probably including institutional death.

This paper will analyze how modern versions of the breach of duty dynamic have shifted away from the simple justice formula of the Code of Hammurabi; it will focus, in particular, on how the breach of duty dynamic can play out in the context of modern high-rises (say those 30 stories or more and above 135 meters in height). Illustrative hypotheticals will be based upon the design development process for a high-rise in San Francisco.

Using contemporary legal standards, how can a design professional reduce the risk that their institution will receive the death penalty after their structures are exposed to strong and severe earthquakes, including foreseeable MCEs? The answer is revealed in the testimony that the owner and its design professionals develop long before their structure performs poorly in a foreseeable earthquake and, as a consequence, long before their seminal choices are subjected to legal inquiry.

Keywords: *Hammurabi; ethics; duty; claims; testimony.*



1. Introduction

Those who design and build high-rises in urban centers will be held accountable when third parties are injured as a result of unacceptable performance of the high-rise during a foreseeable earthquake. The details of legal liability will vary from jurisdiction to jurisdiction, but the basic dynamic that was part of the Code of Hammurabi currently is universal in the civilized world: if the earthquake hazard was foreseeable and the unacceptable performance was avoidable, decisions made by the owner and its design team will be the subject of legal inquiry, including whether those decisions were reasonable under the circumstances.

Developers and designers of high-rises simply cannot immunize themselves from all potential legal liability arising from earthquakes. However, by incorporating the lessons learned from recent seminal legal precedents, developers and designers can refine their means and methods of satisfying basic legal duties, and thereby reduce their potential legal liability. This improvement in best practices requires an explicit decision concerning the appropriate seismic performance target (such as those specified in ASCE 7-10) before construction is consummated. In particular, both developer and designer must be able to prove that before the project reached substantial completion, each considered adopting a performance target that was above the minimum standard prescribed by building code. Controlling legal standards have evolved in the direction of requiring structural consultants (and other members of the design team) to spell out to the developer what performance targets can be selected above the minimum standards specified by code. This paper will identify the evidence that judges and juries will require each party to provide when third parties pursue legal claims after sustaining injuries caused by unacceptable performance of high-rises during foreseeable earthquakes. This paper will also demonstrate how developers and their design professionals can reduce their seismic risk in the legal arena.

2. The Hammurabi Code and the duty to avoid unacceptable structural performance.

For several centuries, various legal systems in the civilized world have recognized that those hired by the owner to design and/or build structures have a legal duty to protect the interests of the owner and the interests of third parties. For instance, the Code of Hammurabi (dating from approximately 1754 B.C.) created strong incentives for the builder to protect the life and safety of the owner:

- “229. If a builder has built a house for a man, and has not made his work sound, and the house he built has fallen, and caused the death of its owner, that builder shall be put to death.”

Using the lens of modern Western jurisprudence, this dynamic can be described as recognizing a duty owed by builder to owner, which if breached, will lead to legal liability of an existential nature (“death”). Similarly, the builder’s duty to protect life and safety extends to certain third parties:

- “230. If it is the owner’s son that is killed, the builder’s son shall be put to death.”
- “231. If it is the slave of the owner that is killed, the builder shall give slave for slave to the owner of the house.” [1]

Obviously, as civilization has evolved after the time of Hammurabi, the boundaries and contours of legal liability for professional negligence (leading to design flaws) and negligent construction (leading to structural defects) has changed. For instance, modern civilization does not countenance slavery and hence does not mete out punishment for slave death caused by design flaws or construction defects. For contemporary breaches of the duty to protect life and safety, most legal systems impose money judgments against corporations (which, because of punitive damages, can be of an existential magnitude) rather than death sentences against individuals. In this respect and others, the underlying dynamic lives on and becomes more complex as civilization advances. The best practices by which design professionals can satisfy their basic duties to owners and third parties have necessarily expanded because of the improvement of widely available engineering tools, and the concomitant ability (i) to foresee earthquake hazards and (ii) to predict the performance of modern facilities, such as high-rises.



3. Ethical duties owed by design professionals to developers, owners and third parties: “Damned if I do and damned if I don’t.”

In the civilized world, it is axiomatic that owners who lack the technical expertise to design and build a high-rise are expected, legally, to hire competent design professionals and contractors to perform those licensed services. Many developers of high-rises tell their designers and contractors that they want the “biggest bang for the buck”—that is, they want to minimize investment costs in order to maximize profits. The shorter the planned period for recovering profits, the greater the potential for an ethical conflict to confront the structural consultant. Specifically, if the developer wants to reach substantial completion and then quickly transfer title to a purchaser or an owner association, the temptation is great to undervalue (or, worse, trivialize) the nature of the earthquake hazard at the specific site. In this fast conversion scenario (sometimes referred to as a “flip” transaction), the developer’s budgeter will create pressure on the design team to minimize design, development and construction costs. In turn, the structural consultant will be pressured to match seismic capacity to minimal code standards. The structural consultant can be “damned” if he or she accedes and recommends the minimal code target—he or she could well absorb elevated exposure to legal liability compared to the lower level of professional liability if a more robust seismic performance target is adopted by the developer. In most jurisdictions, professional liability insurance will not obviate all of this additional professional risk.

If, in the structural consultant’s judgment, this elevated professional risk is unacceptable, he or she should communicate to the developer that a performance target above code minimum is appropriate, given the specific earthquake hazard potential at the site. This likely will yield higher cost, and probably lower profits in the short run, which will need to be rationalized by the structural consultant and design team. If the developer declines the recommendation, then the structural consultant may well be “damned if I don’t”—the structural consultant could lose the engagement to another design professional who is willing to take on the elevated risk of professional liability. Best practice in urban centers with high seismicity will be for the more conservative design professional to “walk away” rather than take on unacceptable professional liability risk that could prove fatal to the firm should the facility fall short of acceptable performance in a foreseeable earthquake.

Not all developers and not all owners insist on the lowest possible cost for structural elements that are vulnerable to seismic demands. Some owners expressly adopt long-term strategies for their high-rises, and assume that one or more earthquake hazards will be experienced. These owners often accept the recommendation that extra costs be incurred in order to obtain better performance in foreseeable earthquakes over 50 or more years. For many owners, this not only improves the utility value of the facility, but helps to reduce seismic risk in the legal arena as well. This more conservative approach also tends to reduce the tension between the interests of the owner and those of the design professionals on the project.

Two recent legal precedents help illustrate the issues that contemporary judges and juries will resolve when owners and/or design professionals breach their duties, and third parties are injured as a result.

4. The *Myrick* case: Owners are not immune from legal attack even when they follow minimal code standards in the design, maintenance and operation of their facilities.

In California, the basic rule of tort liability for property owners (including an owner of a new high-rise) is that the owner must use ordinary care in the management of his or her property to prevent injury to another. [2] California’s leading legal precedent concerning civil liability for poor seismic performance suggests that, in light of this basic rule, the owner of a high-rise will be expected to act to prevent unsatisfactory seismic performance that may result from foreseeable earthquakes.

As a matter of law, is a high-rise owner automatically immune from legal liability to tenants, visitors and neighbors if it chooses to design, build or operate a structure in accordance with minimum building code standards? In most American jurisdictions, the answer will be in the negative! In California’s leading legal precedent concerning commercial owner liability for poor seismic performance, entitled *Myrick v. Mastagni* (2nd District 2010) 185 Cal. App. 4th 1082 (*Myrick*), the trial judge, the jury and the court of appeal all found that a building owner can have legal liability for the poor seismic performance of a structure even if its



management and use is in accordance with the minimum standards of local ordinances and building codes.

The California Court of Appeal ruled that the test for the trier of fact is whether the owner has acted as a reasonable person in view of the probability of injury. *Myrick*, 185 Cal App. 4th at 1087. In the *Myrick* case, the owners of a commercial building (the “Acorn”) were found liable for the deaths of two women who were struck by a collapsing roof during moderate shaking during the 2003 San Simeon earthquake. The plaintiffs in the *Myrick* lawsuit sustained their burden of proving to and persuading the jury that by failing to correct known structural vulnerabilities in the Acorn, the owners failed to use ordinary care in its use and operation leading up to the earthquake that triggered its collapse. A jury required owners to pay \$2 million in compensation mainly because the owners failed to act promptly to increase the seismic capacity of their building (by retrofit) after becoming aware of its seismic vulnerability. The owners appealed on the theory that they had no duty to retrofit until 2018, the deadline established by local municipal ordinance and, as a matter of law, owners’ duty “was limited to compliance with the ordinance.” The appellate court rejected that argument, reasoning that in California the “general rule is that statutory compliance is not a complete defense in a tort action.” Among other things, “a statute, ordinance or regulation defines a minimum standard of conduct” and mere adherence to that minimum standard “does not preclude a finding that a reasonable person would have taken additional precautions under the circumstances.” *Myrick*, supra, 185 Cal.App.4th at 1087-1090.

As one would expect, the defendant owners in *Myrick* argued that a policy underlying the retrofit ordinance was the protection of the owners’ property interests, which should have prevailed, as a matter of law, over the interests of the plaintiffs whose family members had died. The appellate court rejected that argument: “Certainly, the city considered the interests of the building owners in setting the deadline for compliance. But the overriding policy behind the seismic retrofit ordinance, taken as a whole, is not the promotion of the interests of building owners. Instead, the overriding policy is public safety” (*Myrick*, supra, 185 Cal.App.4th at 1090). In many ownership scenarios, judges and juries will extend the logic of the *Myrick* precedent to ask whether the owner acted reasonably after it became aware that its high-rise had a seismic vulnerability (such as sliding-shear vulnerability in exterior corners, for instance). The judge and jury will want to know when owner was on notice (or should have been on notice) of the vulnerability and how it related to the foreseeable performance of the structure. In many scenarios, the judge and jury will want to know if owner proactively engaged a structural consultant to predict the seismic performance of the vulnerable structure in foreseeable earthquakes. The prudent owner should be prepared to defend against the argument of an aggressive plaintiff’s attorney that before the earthquake in question, it should have engaged a competent structural consultant to predict for owner whether significant load-bearing assemblies of the high-rise (i) would perform elastically or inelastically during (ii) three or more earthquake scenarios, and if the prediction was inelastic performance, (iii) whether that performance would likely result in falling hazards, collapse or other injurious patterns of unsatisfactory structural (and non-structural) behavior.

5. The *Beacon* case: Design professionals have duties to protect third parties from foreseeable harm caused by their designs, even when they have no contractual obligations to those third parties.

As a matter of law, is a design professional who contracts directly with the project developer automatically immune from legal liability when a party with whom it has no contractual relationship claims that it is entitled to damages for the poor seismic performance of the facility? In most American courts, the answer will be in the negative! In a published California Supreme Court opinion entitled *Beacon Residential Community Association v. Skidmore, Owings & Merrill LLP et al.* (2014) 59 Cal. 4th 568 (“*Beacon*”), the California Supreme Court held that the architects who had directly contracted with the developer owed a non-statutory duty of care to follow-on purchasers of project units despite the absence of any contractual relationship with the follow-on purchasers and despite language in the architects’ contracts that attempted to limit their liability to future follow-on purchasers. Most American courts would apply similar reasoning and reach the same conclusion if follow-on purchasers pursued claims for poor performance of project units during an earthquake



against the structural engineers of record who had contracted directly with the developer.

Following the holdings of the **Beacon** opinion, most judges would allow the injured bystanders to allege that the structural engineer of record owed them a duty of care to avoid unacceptable performance during a foreseeable earthquake that was equal to or smaller than the 1906 San Francisco earthquake. The same would be true in the event the high-rise tower performed poorly and homeowners sustained personal injuries and economic damages. A zealous plaintiff's attorney will push hard to extract testimony that the structural engineer designed the new high-rise to save as much money as possible and subordinated adequate seismic capacity in the process.

6. Hypothetical High Rise Project in San Francisco.

In a hypothetical San Francisco project where the developer wants to build a 30 story high-rise (say approximately 136 meters in height), the structural engineer of record should consider what his or her testimony would be in the event that the structure fails to perform elastically in a service level earthquake (say peak ground acceleration on the order of 0.20 gravity) and bystanders are severely injured by spalling concrete and falling non-structural components (say HVAC assemblies) when it sustains a partial collapse. Following the **Beacon** opinion, most judges would allow the injured bystanders to allege that the structural engineer owed them a duty of care to avoid unacceptable performance during a foreseeable earthquake that was equal to or smaller than the 1906 San Francisco earthquake. Needless to say, the structural engineer's ability to manage its risk in the legal arena is enhanced if he or she can truthfully testify that the design was intended to exceed the minimal standards of San Francisco's building code in light of the owner's choices for seismic performance targets specified in ASCE 7-10 and ASCE 41-13.

How can the design professional manage its risk arising from possible claims of third parties in this scenario? As was suggested above, the design professional can better manage this risk by delivering in writing to the developer predictions of performance of the project facility in at least three earthquake scenarios: service level; design basis; and maximum considered event. After discussing the details of these predictions, the design professional should obtain from the developer a written decision of which performance targets (using the frameworks specified in ASCE 7-10 and ASCE 41-13) it has chosen for both structural and non-structural components of the facility. [3] If the design professional adheres to the performance target choices of the developer in design development and project management, its risks should be reduced.

7. Conclusion.

Recent published court opinions in California illuminate how owners and designers will be required to defend themselves from legal claims arising from poor performance of high-rises during strong and severe earthquakes. The recent **Myrick** decision held that owners are not automatically immune from legal attack even when they follow minimal code standards in the design, maintenance and operation of their facilities. In the recent **Beacon** decision, the California Supreme Court held that design professionals can have duties to protect third parties from foreseeable harm caused by their designs, even when they have no contractual obligations to those third parties.

These legal holdings will shape the ultimate legal liability of owners and designers of high-rises in San Francisco following the next cataclysmic earthquake (say a seismic event causing dislocation close to or on the order of the 1906 earthquake). By ordinance, the Community Safety Element of San Francisco's General Plan requires owners and designers to develop residential high rises that will survive strong and severe earthquakes, with minimal physical damage, and enable residents to return to their units shortly after the event. [4] Some high-rises will fall short of complying with these performance targets and many of those individuals who are in turn injured will seek legal redress against owners or design professionals or both.

What tangible steps can owners and designers take to reduce the risk that they will be sued by third parties for the poor performance of their high-rises during a strong or severe earthquake? First, owners and design professionals must understand the likely seismic performance of their high-rise in foreseeable strong and severe earthquake scenarios. This includes an up-to-date understanding of actual seismic performance of other high-



risers, including those which have been tested by significant earthquakes in Japan, New Zealand, the United States and Chile during at least the last fifty years. As a practical matter, this will often entail understanding what the testimony of a qualified forensic engineer would be if a legal challenge was made. This understanding should correspond to written memoranda prepared before the owner finalizes decisions to construct or retrofit, and preferably long before the seismic event.

Second, before construction of the high-rise commences, the owner and its design professionals should discuss and agree upon the appropriate structural and non-structural performance targets that will adhere to the local code and ordinance mandates. In the case of San Francisco, owners and design professionals should discuss and agree on the high-rise performance targets to be selected from ASCE 7 and 41 that best comply with the Community Safety Element of the San Francisco General Plan, among other things.

Thirdly, the owner and its design professionals should develop further testimony after the owner finalizes decisions to construct. The point of this testimony should be to demonstrate that construction, maintenance and operation of the high-rise adhered to or exceeded the requirements of local ordinances and codes, as well as those inherent in seminal performance targets. Before any strong or severe earthquake, owner and its design team should be ready to testify how they obtained the “biggest bang for the buck” without sacrificing the seismic capacity of structural and non-structural elements. This will put them in a better position to prove that legal attacks lack merit because they fulfilled their contractual obligations and satisfied their legal duties to third parties.

Finally, the cited provisions in the Code of Hammurabi serve as a reminder that throughout history there has been a common perception that owners, designers and builders have ethical duties to the future occupants or bystanders of any construction project. Design and construction professionals have an ethical duty to provide structures that are safe for use by others, however that safety is construed; nowhere is it written that design professionals have an ethical duty to optimize the short term return on investment for the developer who has hired them. Our legal system has evolved since Hammurabi, but minimum standards embodied in building codes and various layers of liability insurance should not obscure the fundamental ethical duties that fall to those people and institutions who develop, design, build and maintain modern high rise buildings. Occupants and bystanders of structures in a modern urban environment rightly have the expectation that these structures will perform satisfactorily in foreseeable earthquakes and will have standing to seek legal redress, particularly when modern structures fall short of their expectations. Design and construction professionals should reflect carefully on the personal and institutional implications of the ASCE 7-10 and 41 language regarding 10 percent probability of collapse and 25 percent probability of possibly fatal injuries during a foreseeable MCE when they next sit down with a prospective client to discuss a new project.

References

- [1] Johns CHW (1904, reprinted 1987), *Babylonian and Assyrian Laws, Contracts and Letters*. Gryphon Editions.
- [2] California Civil Code, section 1714.
- [3] American Society of Civil Engineers (2013): *Minimum Design Loads for Buildings and Other Structures*, ASCE/SEI 7-10, Reston, Virginia: American Society of Civil Engineers. American Society of Civil Engineers (2014): *Seismic Evaluation and Retrofit of Existing Buildings*, ASCE/SEI 41-13, Reston, Virginia: American Society of Civil Engineers.
- [4] The City and County of San Francisco (2012): *Community Safety Element of the San Francisco General Plan* (www.sf-planning.org/ftp/General_Plan/Community_Safety_Element_2012.pdf), adopted by the San Francisco Board of Supervisors on October 16, 2012, and signed by the Mayor of San Francisco on October 23, 2012, Ordinance No. 218-12.