THE LEGAL CLOUD LOOMING OVER SAN FRANCISCO HIGH-RISES: LEGAL DEVELOPMENTS SINCE LOMA PRIETA

M. N. WHITE

ABSTRACT

After the Loma Prieta Earthquake, developers built dozens of high-rises (taller than 160 feet) in downtown San Francisco. Most are subject to Administrative Bulletin 83 (AB-083) of the San Francisco Building Code. When seismic performance targets included in AB-083 are taken into account with developments in California law since Loma Prieta, the foreseeable legal consequences of designing, building and using these tall buildings are far more challenging for designers and developers than historically has been the case. Adhering to minimum code standards does not automatically provide immunity to designers and developers when their tall buildings perform poorly in service level, DBE and MCE earthquakes. Managing this risk profile includes selecting the appropriate Risk Category (among other things) specified in ASCE 7-10 (Minimum Design Loads for Buildings and Other Structures, 2011) and its progeny. What legal risk profiles do the developer and lead structural consultant face when, hypothetically, their 350 foot high-rise (first occupied after 2009) is crippled and deemed unsalvageable after a foreseeable service level earthquake (say with a PGA of 0.25); what if tenants and passers-by are injured or die as a result of the poor performance of the structure? Are the defendants automatically immunized from liability if they show that they adhered to minimum code standards? How will the trial judge shape the debate over these and related issues? In most scenarios, the trial judge will hear testimony concerning AB-083 and will consider arguments concerning the significance of two recent California legal cases, Myrick and Beacon. Most judges will rule: that under Myrick, 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; and that under Beacon, designers can be found liable to innocent bystanders.

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After the Loma Prieta Earthquake, developers built dozens of high-rises (taller than 160 feet) in downtown San Francisco. Most are subject to Administrative Bulletin 83 (AB-083) of the San Francisco Building Code. When seismic performance targets included in AB-083 are taken into account with developments in California law since Loma Prieta, the foreseeable legal consequences of designing, building and using these tall buildings are far more challenging for designers and developers than historically has been the case. Adhering to minimum code standards does not automatically provide immunity to designers and developers when their tall buildings perform poorly in service level, DBE and MCE earthquakes. Managing this risk profile includes selecting the appropriate Risk Category (among other things) specified in ASCE 7-10 (Minimum Design Loads for Buildings and Other Structures, 2011) and its progeny. What legal risk profiles do the developer and lead structural consultant face when, hypothetically, their 350 foot high-rise (first occupied after 2009) is crippled and deemed unsalvageable after a foreseeable service level earthquake (say with a PGA of 0.25); what if tenants and passers-by are injured or die as a result of the poor performance of the structure? Are the defendants automatically immunized from liability if they show that they adhered to minimum code standards? How will the trial judge shape the debate over these and related issues? In most scenarios, the trial judge will hear testimony concerning AB-083 and will consider arguments concerning the significance of two recent California legal cases, Myrick and Beacon. Most judges will rule: that under Myrick, 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; and that under Beacon, designers can be found liable to innocent bystanders.

Introduction

How does the developer and the lead structural consultant manage their respective legal risks when they develop, design, build and operate a high-rise in San Francisco? The starting point for meeting this challenge is to develop a strong evidentiary record long before the high-

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rise is subjected to a service level (or more severe) earthquake. This includes knowing ahead of time what evidence concerning development of the structural design will be presented to a judge and jury in the event the facility performs poorly in a foreseeable earthquake. In particular, the developer and the lead structural consultant should establish a clear understanding of the performance targets for the facility long before construction commences.

A hypothetical high-rise project will be used in this paper to illustrate the practical steps that can be taken by both the developer and the lead structural consultant to develop an evidentiary record that will help manage their respective legal risk profiles. The hypothetical high-rise facility has the following characteristics:

- Structural design and submittal documents for building permit purposes specify that the project will employ non-prescriptive seismic design procedures. They are submitted on July 1, 2018, six months after entitlement is granted by the San Francisco Planning Commission.
- The intended use is residential (rentals for a ten-year period followed by condominium conversion). The useful life of the structure is projected to exceed 50 years. It is not an essential facility (e.g., not a hospital).
- The height is 350 feet (hn as defined in San Francisco’s Building Code), including a tower of 35 stories over a one story basement. The principal seismic force-resisting system of the tower is comprised of a special reinforced concrete shear wall core. The tower foundation consists of a pile cap supported by several hundred precast concrete piles.
- When the structure is under nonlinear lateral deformation, the structural design contemplates ductile yielding mechanisms.
- The tower is cladded in a glass and aluminum curtain wall.

What are some of the salient factors in San Francisco’s permit-granting process? San Francisco’s Administrative Bulletin 83 (enacted March 25, 2008 and updated January 1, 2014; herein “AB-083) [1] requires the design team to establish during a non-prescriptive “service-level evaluation” that the structure will “demonstrate acceptable seismic performance for moderate earthquakes.” Commentary at 83-3. In particular, it directs that the “primary structural system is required to demonstrate acceptable, essentially elastic seismic performance” during a “service-level” earthquake (defined as one with a 50% probability of exceedance in 30 years; AB-083 at 83-4, 5; emphasis added). “Essentially elastic performance” includes a prediction of no worse than “minor yielding of ductile elements of the primary structural system, provided such results do not suggest appreciable permanent deformation in the elements, strength degradation, or significant damage to the elements requiring more than minor repair.” AB-083 Commentary 83-5. In addition, “it is expected that the building cladding will remain undamaged and that egress from the building will not be impeded when the building is subjected to the service-level ground motion.” AB-083 Commentary 83-5. “The evaluation shall demonstrate that the elements being evaluated exhibit serviceable behavior.” AB-083 83-5.
The following are examples of evidence that the developer and lead structural consultant can develop during the design development phase, long before commencement of construction, of our hypothetical tower:

- The structural consultant proposes to the developer that the tower be designed to exhibit “essentially elastic performance” during any service level (or smaller) earthquake. Because of its proximity to essential facilities in downtown San Francisco, the structural consultant proposes the adoption of Risk Category III for the facility, in accordance with both ASCE 7-10 and ASCE 7-16 [2]. The developer agrees and budgets enough funds to design and build to those performance targets.

- The structural consultant demonstrates to San Francisco’s Structural Design Reviewer (aka “Peer Reviewers” selected by San Francisco’s Department of Building Inspection; see Administrative Bulletin 082 (December 2016)[3]) that its non-prescriptive “service-level evaluation” demonstrates that, during a service level earthquake and if built as designed: the tower will sustain no more than “minor yielding of ductile elements of the primary structural system,” without permanent deformation in the elements, strength degradation, or significant damage requiring more than minor repair; the curtain wall system will remain undamaged; and the tower doors to the outside will not be impeded.

- The Structural Design Reviewer accepts the proposal to abide by the requirements of Risk Category III of ASCE 7 and approves the proposed structural design, with mutually agreeable modifications. The developer understands that the risk of collapse of the tower is less than six percent during an MCE and agrees to modify the project budget to satisfy the “finalized” structural design.

The Legal Cloud Looming over San Francisco High-Rises Built After Loma Prieta

Let us further assume that construction of the hypothetical high-rise is completed by January 1, 2021 and that it experiences a service level earthquake (peak horizontal ground acceleration of 0.25g and a spectral acceleration of 0.13g) on July 1, 2021. As predicted, the facility experiences minor cracking in the core, the curtain wall remains intact and the exterior doors do not rack. No passers-by nor neighbors are injured as a result of the tower’s performance and only three tenants sue the developer for damage to architectural elements of their units. Because of the strong evidentiary record hypothesized above, resolution of all claims costs less than $1 million and repair costs total $300,000. For purposes of this paper, this will be referred to as part of the baseline legal risk profile for, respectively, the developer and structural consultant.

For the developer and the structural consultant, the legal risk profile will increase if the pre-earthquake evidentiary record and the tower’s performance are assumed to be worse than above. Assume that instead of adopting Risk Category III, developer insists on Risk Category II in order to save five percent on construction costs. Assume further that during the service level earthquake, ductile elements of the core sustain more than minor yielding and repair costs are on
the order of $7.5 million. Assume as well that the curtain wall separates, injures three passers-by and the building is red-tagged for three months, resulting in many millions of lost revenues. Curtain wall repairs are another $2.5 million and the injured passers-by settle for $3 million. Needless to say, these assumptions yield elevated risk profiles above the baseline.

If we further change the hypothetical to assume that the tower collapses during an MCE (say with a peak horizontal ground acceleration of 0.6g and a spectral acceleration of 0.28g), then the risk profile expands dramatically. Ten people are seriously injured and five die as a result of the collapse. The tower is demolished. Several lawsuits are consolidated for trial and plaintiffs’ experts conclude, among other things, in sworn testimony, that both developer and structural consultant made a fatal mistake of designing to Risk Category II instead of paying the additional five percent required to design to Risk Category III.

In response, experts for the defendants conclude that Risk Category II was the minimal allowable performance target and the tower always faced a ten percent chance of collapse as articulated in both ASCE 7-10 and ASCE 7-16. They opine that neither developer nor structural consultant should be found negligent because they adhered to minimal code standards and the tower performed within the range of reasonable expectations.

In our hypothetical, deciding who was reasonable or negligent will fall to the jury, subject to instructions provided in writing by the trial judge. For the reasons discussed below, most judges will not, as a matter of law, immunize either the developer or structural consultant from possible liability even if they establish that they met minimum code standards. Most judges will instruct the jury that liability can be imposed on these defendants if they find that defendants (i) had a duty to deliver a facility that would perform above code minimum standards and (ii) breached that duty. With such poor structural performance and the devastating consequences, it will be an uphill battle for defendants to avoid liability in the face of such instructions.

Most judges rely on statutes and published legal precedent when assembling jury instructions. In California, the basic rule of tort liability for property owners (including an owner of a high-rise) is that the owner must use ordinary care in the management of his or her property to prevent injury to another. California Civil Code, section 1714 [4]. California’s leading precedent concerning legal liability for poor seismic performance suggests that the owner of a high-rise will be expected to act to prevent unsatisfactory seismic performance that may result from foreseeable earthquakes, even if it was designed, built and operated in accordance with minimum code standards.

In the published court opinion entitled Myrick v. Mastagni (2nd District 2010) 185 Cal. App. 4th 1082 (Myrick) [5], 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.
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.

Most residential high-rises built in San Francisco after Loma Prieta were designed and built to meet the performance targets of Risk Category II, while most mixed-use high-rises arguably met the requirements of Risk Category III. Many expert witnesses will testify that virtually all of these residential high-rises should have been designed and built to Risk Category III, which mandates a substantially lower collapse rate in MCE earthquake scenarios. Many of those experts will also testify that San Francisco’s General Plan (particularly its Community Safety Element) requires all new high rises to minimize property damage and to allow residents to promptly return to their residential condominiums after a significant earthquake. Because ASCE 7 contemplates that up to ten percent of all Risk Category II high-rises will collapse in an MCE, it is foreseeable that two or more residential high-rises will be expected to collapse during the next MCE in San Francisco, with substantial loss of life, personal injury and devastating economic loss. Legal counsel and experts for the injured parties will almost certainly argue that the collapsed towers should have adhered to the stricter requirements of Risk Category III.

Design Professionals Can Owe Legal Duties to 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 filed July 3, 2014 and entitled Beacon Residential Community Association v. Skidmore, Owings & Merrill LLP et al. (2014) 59 Cal. 4th 568 (“Beacon”) [6], 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 and neighbors to allege that the structural engineer of record owed them a duty of care to avoid unacceptable performance during a foreseeable earthquake that was smaller than or equal to the 1906 San Francisco earthquake. The same would be true in the event the high-rise

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tower performed poorly and homeowners sustained personal injuries and economic damages. Thus, in our hypothetical outlined above, the structural consultant whose high-rise has collapsed will probably be required to defend on the merits claims that he or she owed duties of care to third parties and those duties were breached.

A precursor of such earthquake-driven litigation is currently being played out in San Francisco Superior Court. Several pending lawsuits arose from unexpected settlement experienced by the Millennium Tower (a 58-story, 605-foot tall structure over a one story basement) located at 301 Mission Street in San Francisco. One lawsuit is being pursued on behalf of the homeowner’s association for the Millennium and seeks more than $200,000,000 against developer entities and members of the design team, the general contractor, the developer of a nearby high-rise (the Sales Force Tower), as well as the public entity developing a transit center nearby. **Millennium Tower Association v. Mission Street Development LLC, et al** (S.F. Sup. Ct.) Case No. CGC-17-557830. Many lawsuits have been filed on behalf of individual owners of Millennium Tower units, including **Butterly et al v. Millennium Partners Management LLC, et al** (S.F. Sup. Ct.) Case No. CGC 17-556292. The gist of the charging allegations of these cases is that since commencement of construction, the amount of settlement sustained by the Millennium Tower far exceeds that predicted by members of the project design team and that such information was wrongfully concealed from both the Association and unit purchasers (among others) before sales of individual units took place. Based on current, publicly available information, it is expected that some experts will testify along the following lines:

- The original design anticipated one inch of settlement under Millennium Tower by the time of construction completion, and additional long-term settlement due to compression of the underlying clay layers of five inches. Settlement was expected to be uniform over the Tower foundation area. See, e.g., G. Deierlein; M. Schotanus; C. Shields, *Structural Safety Review of the Millenium Tower* (July 29, 2017) p. 2 [7].
- Contrary to the predicted performance, it appears that the Millennium Tower settled six inches at the time of construction completion, instead of one inch. And, as of July 2017, settlement was on the order of 17 inches instead of five over the long-term. Moreover, settlement has not been uniform and the Tower leans to the west on the order of 14 inches and leans to the north on the order of six inches as of July 2017. This is roughly twice what would be considered acceptable construction tolerance for out-of-plumb. Id. at pp. 1, 5, 11.
- Because the Tower has experienced unexpected and excessive settlement and tilt, and lack of stabilization of the settlements, in-depth investigation was undertaken to determine whether it meets the minimum structural and seismic safety requirements expected under San Francisco and California building codes. Id. at pp. 2 and 11.

This still-developing case history reveals a pattern that unfolded in the **Myrick** case and will unfold in future cases arising from unsatisfactory high-rise performance during foreseeable earthquakes: before unacceptable performance, the developer/owner becomes aware of a
troublesome mechanism in structural components and before that flaw is corrected, others are harmed by it, leading to litigation which requires uncovering evidence of performance targets implicitly or explicitly adopted by the facility stakeholder. In the case of the Millennium Tower, the parties will delve into what the selling entities knew about the depth of settlement upon completion of construction and whether that information, along with projections of additional settlement, was shared with prospective purchasers, among others. In future litigation arising from unacceptable high-rise performance during foreseeable earthquakes, the developer/owner will be required to testify whether he or she was aware of the failure mechanism(s) at issue when construction was completed, and what tangible steps were taken to control those vulnerabilities and thereby avoid foreseeable harm to third parties. Among other things, what performance targets were selected in order to address potential harm inherent in the structural design? It is better practice to know the answer to that question before the earthquake than to reveal it for the first time afterward.

Conclusion

In future litigation arising from unacceptable high-rise performance during foreseeable earthquakes, both the developer/owner and structural consultant will likely be required to testify whether he or she was aware of the failure mechanism(s) at issue when the design was being developed and when construction was completed, and what tangible

References

1. City and County of San Francisco, Department of Building Inspection, Administrative Bulletin 83 (enacted March 25, 2008 and updated January 1, 2014).
2. ASCE 7-10 and ASCE 7-16.
3. City and County of San Francisco, Department of Building Inspection, Administrative Bulletin 83 (enacted March 25, 2008 and updated January 1, 2014).