



## Let's Be Clear About What We're Doing

Chris D. Poland, S.E.

2007-2009 Chairman, CASE

What are you saying to your clients about building performance? Do they understand the long-term impact of the design decisions you are making on their behalf? Do you practice the decades old habit of simply promising to meet the code and not answering their questions related to how the building will perform, or have you jumped into the performance based engineering circle?

It appears that most of us are still unwilling to discuss building performance, especially as it relates to low probability hazards such as earthquake, wind, flood, and fire. This attitude needs to change if we expect owners to make good choices and their communities to enact good public policy. You may be concerned that we can't make such promises, but our ability to predict building performance is improving every year and we are at the point that we can talk comfortably about it. People and their communities need to understand what risks they face, what they are buying, and what they are having designed. It's part of being a "living community" with a focus on providing a safe, healthy and economically secure environment. Part of that focus is based on the capabilities of the built environment, and that's where we come in.

My professional career began in the early 70s. I believe it was a time of uncertainty for structural engineers involved in seismic design. The 1971 San Fernando earthquake, followed by earthquakes in Managua and Caracas, brought significant surprises. We quickly learned that the ground motion could be much larger than expected, that buildings needed extreme ductility to survive, and that different structural systems performed very differently even when designed to what we thought was the same criteria. The best thinking of that day was to make buildings as strong and durable as possible, and not promise anything but a "life-safe" performance.

For the subsequent 30+ years, observations of building and lifeline performance in major earthquakes have been supplemented by strong motion recordings, sophisticated scientific research, material testing, and enormous computing capability that is bundled up and catalogued in extensive design guidelines,

standards and model codes. We have learned how to describe seismic hazards in scientific terms, predict performance and determine what level of damage is tolerable. I believe that similar advancements have been made in the other low probability hazards we face – wind, flood and fire.

We know that healthy communities continuously grow by leveraging their intellectual capital to drive economic development while protecting their cultural heritage. Success, in part, depends on the support of a healthy built environment that is rooted in contemporary urban planning, sustainability and disaster resilience. In most parts of the country, the ability to rebound from major natural disasters is an important facet of community health, one that depends on the expertise of the nation's design professionals.

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We have the responsibility to deliver our expertise in an understandable fashion that can be interwoven into public policy while recognizing the community's resilience; that is, its natural ability to rebound. No one else has the technical knowledge to bring that perspective to the policy table. We need to speak clearly about the damage in intuitive, non-probabilistic terms. For instance, I have started talking about whether buildings will be usable while being repaired or only after the repairs are done, if an "expected" or "extreme" earthquake event takes place. It is no longer enough to just say they are "life safe".

Our reluctance to speak up leads to reluctance on the part of most communities to implement contemporary policies related to response and recovery. Our silence causes them to maintain plans that are rooted in a misunderstanding of the hazard faced and the risk posed to the built environment. Probabilistic lingo and public debate about how big the "big one" will be drives communities to resort to their own experience and intuition. "It's never happened here before" is a common justification for setting aside policy changes

that will improve safety and resilience. The usual misconception of how much damage the built environment will experience is based on the belief that building officials and their latest building codes assure damage-proof buildings, even though the code only promises that buildings will only protect people in the midst of significant damage.

The solution: we should craft messages in broad based, usable terms that name the hazard, define performance, and establish a set of performance goals that represent the resiliency needed to support a community's natural ability to rebound from major disasters. The recent popularity of the ICC codes and the new level of consistency provided by ASCE 7 gives us a first time opportunity to add such simple transparency to what we are doing. We have the opportunity to add clarity.

Many of us strive to contribute to the greater good while doing our everyday jobs. It is a passion for me and has led to my personal devotion to seismic risk reduction advocacy nationwide. As design professionals, we are very lucky to be able to contribute an expertise that can save lives as well as communities. In 30 plus years, I've learned that I can be effective when working with other structural engineers on buildings codes, and when working with the larger family of earthquake professionals to set the pace of change. We have been able to change public policy by providing our technical expertise in clear terms to the broader community of policy makers, helping them craft the policies needed to instill change.

This process can be done in preparation for all disasters, but it takes patience and a broad understanding of all the issues being faced. It's not unlike our trade; fitting a structural system into a building. Only now, we have the opportunity to fit disaster resilience into our community. The results are worth the effort and frustration. I challenge each of you to do what myself, and others, have been doing for years. Volunteer and work toward making your community safe, healthy, and economically secure. ■