

## PEER's Guidelines for Performance-Based Seismic Design of Tall Buildings

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### *CIF NOVA Award Nomination*

From 2000 through 2008, the western United States experienced a surge in the design and construction of tall buildings. Programmatic and economic demands resulted in many of these buildings rising to heights beyond the range of building code prescriptive provisions and being designed by various performance-based approaches. Project engineers, project reviewers, responsible jurisdictions, the research community, and other individuals and organizations with an interest in public safety recognized the need to develop guidance for these performance-based designs.

In April 2006 the Pacific Earthquake Engineering Research Center (PEER) of the University of California, Berkeley, formed the Tall Buildings Initiative as a research and development program to evaluate and advance the practice of performance-based seismic design of tall buildings. The program enlisted a wide range of stakeholder organizations and individuals to fund, manage, and conduct studies in support of the program. Through a series of consecutive tasks aimed at better understanding tall building earthquake performance, the initiative worked towards the culminating outcome of this effort: Guidelines with design criteria and recommendations that would enable tall building construction to reach new heights while also ensuring safe, usable tall buildings following future earthquakes.

PEER published and released its "Guidelines for Performance-Based Seismic Design of Tall Buildings" in November 2010. The Guidelines provide a unified approach for performance-based design and review of new tall buildings located in an area of high seismicity. They present a recommended alternative to the prescriptive procedures for seismic design of buildings contained in standards such as ASCE 7 and the International Building Code (IBC). They serve as a reference source for design engineers, building officials, and peer reviewers engaged in the seismic design and review of individual tall buildings, as well as developers of building codes and standards. They provide more specific and research-supported procedures for these users, and thus fill the void in current standards and recommendations in this area.

Seismic design of tall buildings in accordance with the Guidelines can offer a number of advantages to tall building design teams. These advantages include:

- More reliable attainment of intended seismic performance
- Reduced construction cost
- Accommodation of architectural features that may not otherwise be attainable
- Use of innovative structural systems and materials

The Guidelines have been widely acclaimed by industry, and received a 2010-11 Excellence in Structural Engineering Award by the Structural Engineers Association of California (<http://www.seaoc.org/awards.html>). A quote from a January 2011 article in Engineering News Record also shows it to be a success:

*"The PEER guidelines appear to distill PBSD information through studies and actual projects to present a very useful road map for designers interested in using PBSD," says Dennis C.K. Poon, a managing principal of structural firm Thornton Tomasetti, New York City. "They are sprinkled with plenty of caution signs intended to minimize detours and result in a safe PBSD result."*

<http://enr.construction.com/buildings/design/2011/0119-SeismicEngineering.asp>

The Guidelines demonstrate how the earthquake engineering profession can be enhanced and advanced by openly and fully engaging both designers and researchers in a mutually beneficial project.

To view and download the Guidelines, visit: <http://peer.berkeley.edu/tbi/publications-reports/>

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