

Pending Seismic Rating System Will Improve Commercial Property Resilience and Value



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Hurricane Sandy's impact on the New York metropolitan area is a sobering reminder of the potential destructive force of natural disasters. The need for commercial real estate developers and owners to plan for and mitigate the effects of high winds and flooding was evident by the destruction left in Sandy's wake.

Commercial buildings are also susceptible to another type of disaster — earthquakes. Earthquakes of magnitude 6.5 or greater have occurred in the U.S. in Alaska, California, South Carolina, the Intermountain West, the Central U.S., and New England. Earthquakes as large as magnitude 9 have occurred in the Pacific Northwest. A 2003 Earthquake Engineering Research Institute (EERI) report estimated that a single large earthquake in a major U.S. urban area could result in economic losses between \$100 billion and \$200 billion.¹

The creation of the U.S. Resiliency Council comes at a time when the federal government, through FEMA and the DHS is stressing the need for long-term planning for resilient infrastructure, critical facilities and communities. Engineers and government authorities have been working for many years toward the development of better metrics to measurably improve the performance of buildings subject to severe ground shaking.

Building codes largely emphasize life safety, with little consideration given to limiting economic losses. Furthermore, most current seismic evaluation procedures focus on the performance of a building's structural elements. This can lead engineers to design primarily to this one point of measurement, which may not optimize the building's overall performance. For example, as described by Bob McIntire, partner at the construction management firm Nova Partners: "For some of the light-weight steel frame building designs we reviewed for clients, the frame may be quite flexible. After a major quake the frame may perform well, with minor damage, but the occupants and contents will be thrown around violently and the façade, ceilings, walls, and fire sprinkler piping are likely to be damaged to a point that it might take six to twelve months to clear out the soggy mess and rebuild the interior."

The deficiencies with the current state of the PML process have been well documented; significant concerns being that several methods do not use a sound technical basis, or are "gamed" to achieve a PML beneath the required threshold.² Thus, the PML process is not considered by many to be a reliable measurement of risk or of resilience, but rather little more than a necessary checkbox to be filled in on a lender's due diligence form.

The consequence of these issues is that a building's probable seismic performance is not reflected in its rents. There are several

reasons for this, including lack of awareness by owners and tenants who are not provided with this information, and a perceived lack of importance relative to other value metrics. In downtown San Francisco, there are examples of new high-rise office buildings that although they were built to surpass modern structural code requirements, they are achieving only the same rents as a well-located, well-maintained building from the early 1970s. Building codes have changed considerably since the 1970s, making major leaps in building resilience by incorporating the knowledge learned from recent earthquakes. The new buildings may be equivalent to today's NHFTA five-star rated cars with side impact panels, front and side airbags, crumple zones and back-up video cameras. The 1970s high-rise might remain standing but may take more than a year to be made functional, and may even need to be torn down. This older building is the equivalent to the vilified Corvair or Pinto, but not priced accordingly in rent or cap rate.

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Unlike in the U.S., the commercial leasing market in Japan rewards buildings that can promise business continuity after a major earthquake. Basic seismic safety was achieved by the

upgrade to the Japanese buildings code in 1981, and validated by the performance of Post-81/82 buildings in Sendai in the 2011 Great Eastern Japan Earthquake. With safety well addressed, the Japanese commercial real estate market is focused on the business-continuity benefits provided by different "anti-seismic" design technologies such as base isolation. Tenants and brokers are aware of the various brands of seismic resilient features that provide performance above code minimums. According to a recent Wall Street Journal article and figures from the real estate brokerage Miki Shoji Co, "Buildings in central Tokyo open for less than one year, which can offer the latest technology in earthquake protection, are now commanding average leasing rates that are 40% above the level for older buildings."³

A seismic rating system that covers safety, repair costs and downtime gives the commercial real estate marketplace and lending community the information needed to demand and reward resilient building design. An educated and aware commercial real estate market over time will compensate owners for seismic improvements, which will eventually result in cities and states with better economic resiliency.

The U.S. Resiliency Council® (USRC) was formed in 2011 as a 501(c)3 nonprofit organization to establish a rating and accreditation system for certifying the resiliency of buildings to natural and man-made hazards. The USRC will award Certification of Resilient

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Engineering (CoRE®) Ratings, much like the US Green Building Council® issues LEED® ratings. The USRC intends that CoRE Ratings become the standard for quantifying the value of improved disaster resilience, and a key metric for due diligence in real estate transactions. Ratings will benefit building owners, lenders, tenants and government jurisdictions by increasing the value of well-designed properties and providing a means to quantify risk. Policy makers will use CoRE ratings to compare and prioritize relative risks and to form a basis for developing long-term resilience policy.

It is important to distinguish resilience from sustainability. New York City has the largest number of LEED® certified buildings in the country, but according to Jonathan Rose, an urban planner, Hurricane Sandy revealed that these buildings “were designed to generate lower environmental impacts, but not to respond to the impacts of the environment.”¹ Given the millions of tons of debris generated as a result of Sandy, and the volume of new building materials that will be required to rebuild, one might say that resiliency implies sustainability, but not the reverse.

The USRC will establish an accreditation program for professional engineers who wish to employ the CoRE system. Accreditation will require specific knowledge and training in structural engineering and the performance of buildings under natural and manmade hazards. CoRE Rating certification will also include peer review and validation by the USRC, to ensure that its highest technical standards are maintained.

Initially, CoRE ratings will be offered for earthquake resilient structures. Over time, the USRC expects to adopt CoRE rating systems for other natural and/or manmade perils (e.g. hurricanes, flood, blast).

For the U.S., the proposed seismic rating system will initially be voluntary, and while its use may not be widespread in the short term, these ratings will likely affect rents and cap rates before the end of the 10-year projected holding period, used to make many commercial property purchase and loan decisions. Of course the occurrence of a major earthquake will hasten the market’s awareness and adoption of the rating systems. The New Zealand Christchurch earthquakes in 2010/2011 prompted the country to quickly develop a seismic rating system, known as QuakeStar, to communicate measures of building earthquake resilience to the marketplace simply and objectively.

Government regulation of buildings codes is akin to regulation of automobiles. Safety technology evolves and eventually is reflected in government standards for new cars; crumple zones, air bags, side impact panels were all added as requirements over time. However, once a car is sold, it is basically legal forever. The government does not pull unsafe cars off the road and crush them. So too with many older buildings that met building code requirements when

they were built, but are now known to be safety hazards or may be demolition candidates after a major earthquake.

The USRC offers a technically sound and replicable methodology for implementing a consistent and measurable rating system. Ratings will build upon existing technical standards. The USRC will provide accreditation, training and peer review. CoRE Ratings will be usable by both the public and private sector, by building owners and occupants, for financial and safety assessments.

Tom Sullivan, Principal with the development firm, Westwood Development Partners, points out: “Seismic risk should be a very significant consideration for commercial tenants and other building occupants, not only in areas like San Francisco that are widely known to be seismically active, but in broad areas of the country, where a lack of recent seismic activity masks the fact that the risks are real and substantial. I think that commercial property owners and tenants will become increasingly aware of the importance of assessing seismic risk, and USRC’s efforts to create a standard, recognizable, and understandable rating system can be an important step in making this happen.”



CoRE Rating	Safety	Reparability	Functionality
*****	Limit Entrapment	Loss <5%	Occupiable Immediately Functional < 72 hours
****	Limit Injuries	Loss <10%	Occupiable Immediately Functional < 1 month
***	Life Safe	Loss <20%	Occupiable < 1 month Functional < 6 months
Certified	Life Safe	Not estimated	Not estimated

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- 1 Earthquake Engineering Research Institute, Securing Society Against Catastrophic Earthquake Losses: A Research and Outreach Plan in Earthquake Engineering, June 2003
- 2 Meyer, John D., Seismic Issues that Derail Closings, California Mortgage Bankers Association, Closing Issues Forum, 2004
- 3 Sposato, William, In Tokyo, Stronger Structures Rise, Wall Street Journal, November 06, 2012
- 4 Zolli, Andrew, Learning to Bounce Back, New York Times, November 02, 2012