Resilience is the New Sustainability



Evan Reis, SE



1.4 billion people live in cities at high risk of a natural disaster

ESCALATING THREAT

NUMBER OF BILLION DOLLAR DISASTERS



UNSUSTAINABLE

CATASTROPHIC

LOSSES PER YEAR IN BILLIONS

DEATHS PER YEAR





Resilience is different than "green design"





LEED certified buildings in Superstorm Sandy were designed to have a low impact on the environment...

...but not for the environment to have a low impact on them.

Superstorm Sandy	
Deaths	>200 in 7 countries
Buildings damaged or destroyed	380,000 in NY, NY, CT
Estimated cost	\$71 billion in NY & NJ.
Insured losses	\$16 billion to \$22 billion.
Estimated business losses	\$25 billion
Homes without power	8.5 million
Debris generated	> 10 million cubic yards

Sustainability has largely been defined in terms of carbon









Office: CLT use forecast by building type



"Green" and resilient design are two sides of sustainability









A three-prong strategy for the concrete masonry industry





Strong buildings are central to a healthy and well functioning community

USRC can support existing **strategies and programs** that keep cities running and serving their residents during and after disasters.



Misconceptions – code vs. reality

Christchurch Earthquake, NZ 2010 & 2011

"Design Level and Max. Credible Events"

Only 2 buildings collapsed

50% of buildings in downtown had to be demolished

Were expectations met?

Depends on who you ask!







Los Angeles at Risk





US Resiliency Council performance metrics



+0-3%

Cost

Modern

Codes



RESILIENCE BASED DESIGN

Performance as function of material



Community design guidelines





USRC Getting-to-Silver Initiative



Increasing value through resiliency

The USRC's mission is to improve community resilience, one building at a time. While even new buildings are not earthquake "proof," most structures designed to the latest codes are expected to perform well when subject to an extreme seismic event. With the proper selection of a structural system and building configuration, and coordination with an engineer and contractor to provide post-earthquake inspections and repairs, many new buildings can distinguish themselves from the 80-90% of older building that do not comply with current codes.

Buildings that are both safe and resilient to natural disasters are more valuable to current and future owners, tenants, lenders and insurers, and to the communities in which they are located.

A long term investment

The U.S. Resiliency Council Getting-to-Silver Initiative provides a means for owners to achieve a USRC designation that sets their buildings apart as contributing to a resilient community and as good long term investments. Buildings achieving a Silver

rating are recognized by the US Green Buildings Council[®] through their new RELi[®] Resilience Standard, and the USRC is engaging with

communities, lenders and insurers to incentivize USRC rated buildings in recognition of their value and lower risk.

The USRC Silver rating

An owner of a modern (post 2000) building can typically obtain a USRC Silver rating just by establishing memorandums of understanding with their engineer and contractor to perform an inspection and begin repairs after an earthquake, and with their lender or insurer to make sure that adequate repair financing is in place. It achieves performance in key measures of Safety, Damage and Recovery, indicating expected seismic performance:

- in which loss of life caused directly by damage is not anticipated,
- with an average repair cost of 20% or less of the building's replacement cost
- with a functional recovery time of less than six months.

For more information

Contact the USRC at evan.reis@usrc.org for more information on how to obtain a USRC rating.



Parkrose Middle School









SILVER Portland, OR Parkrose School District KPFF Dull Olson Weekes – IBI Group Davidson's Masonry Mutual Materials Company Educational New Two Story Masonry Bearing Wall





Central Spokane YMCA / YWCA







SILVER Spokane, WA YMCA / YWCA Coffman Engineers ALSC Architects Spilker Masonry Mutual Materials Company Recreational New Two Story Masonry Bearing Wall





Increasing Market Demand for Better Performance

San Francisco



Tenants pay 0% for enhanced seismic designs, but will pay 15% to 20% more for modern systems, LEED rating, etc.

Токуо





In Tokyo, 1970's buildings are being torn down, because new buildings with the latest antiseismic features command rents 40% higher.

Firing with both barrels – a strategy for resilience



- Understand the place that buildings have in community, corporate and family resilience
- Quantify the social and economic returns of resilient design to all stakeholder groups
- Expand LCA to consider the reduction in Nat Cat impacts from resilient design
- Calculate expected building costs to achieve higher performance levels

Thank you!



For more information: <u>www.usrc.org</u> <u>evan.reis@usrc.org</u> <u>www.usrc.org/membership</u>

