



U.S. Resiliency Council

Building Rating System for Earthquakes

Many building owners are unaware that building codes are minimum standards developed to prevent building collapse, and buildings constructed to code standards can still suffer significant damage, making them unusable after an earthquake. Critical and/or high value content stored within these buildings may be irreparably damaged. Lost revenue and other business interruption costs sometimes exceeds the value of the building itself.

A New Tool for Architects in Designing for Resilience

The USRC Rating System provides information useful in designing a building for greater resilience by predicting a building's performance during an earthquake.

Architects already advise clients on decisions that affect a building's function and sustainability; they can now also educate clients on a building's disaster performance and recovery. By working together, the architect and a USRC qualified structural engineer can achieve their client's desired performance for structural, architectural, and MEP components. The USRC Rating System is a highly useful analysis and communication tool that provides flexibility, because the focus is on estimating performance more than on prescribing certain features.



A building can remain standing while still incurring major internal nonstructural damage.

Benefits of a USRC Rating

With a rating, owners can:

- Better understand and control their risk exposure.
- Increase resale value of the building.
- Have a single, quality-controlled and portable report about the building's expected performance.
- Potentially increase lease rates due to perceived greater value. (The benefits of a USRC rating are similar to the benefits associated with LEED® accredited properties which demonstrate that buyer's, leasee's, and renters are prepared to pay a premium for highly rated buildings.)
- Advocate the importance of a building rating for community resiliency and getting both business and the economy back on track after the earthquake.

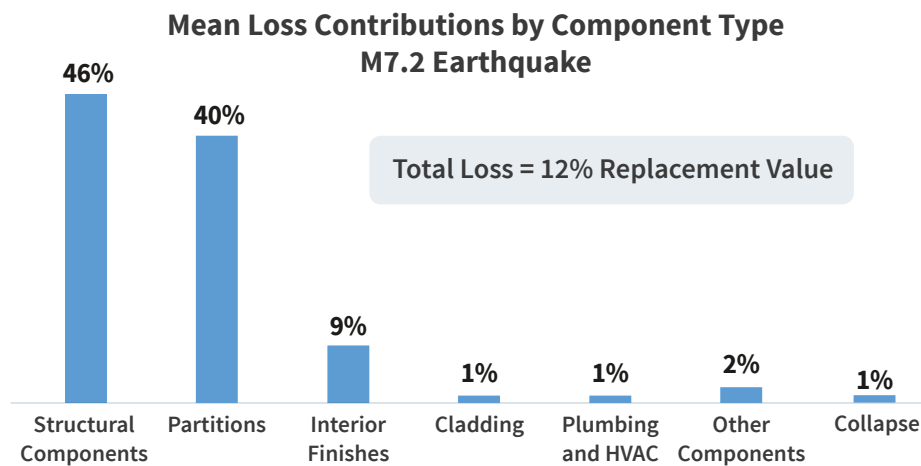


The USRC Rating for earthquakes assessment is communicated by awarding one to five stars in three dimensions – **Safety, Damage, and Recovery.**

The USRC is a 501(c)(3) non-profit led by professionals from many disciplines whose mission is to establish and implement meaningful rating systems that describe the performance of buildings during earthquakes and other natural hazard events, to educate the general public to understand these risks, and to thereby improve societal resilience. Membership is open to public and private organizations, architectural and engineering firms, contractors, building owners, institutions, government agencies and any concerned stakeholder in the built environment.

Measuring Safety, Damage, and Recovery

USRC's Rating System builds on the model of the popular USGBC LEED® ratings but addresses aspects of building performance that are of critical importance for the resilience of businesses and the communities where people live and work, including: the supporting structure, MEP systems, and the architectural components such as cladding, windows, partitions, and ceilings.



Business, public, and community leaders need to know how well their buildings will perform in the case of earthquakes and other natural hazards so they can assess future disaster scenarios, reduce their risk, and better prepare, respond and recover.

Studies show a significant earthquake impacts all aspects of a building's components.

Sustainability versus Resilience

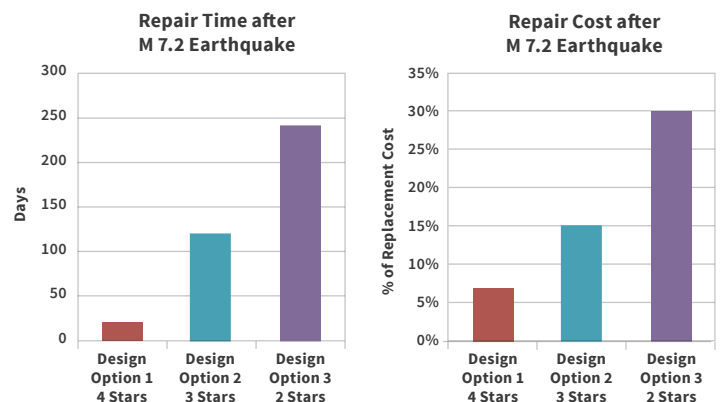
The USGBC and other similar rating systems have revolutionized the industry for green construction. Sustainability promotes designs that reduce our impact on the environment; but resilience promotes designs that reduce the environment's impact on us. The level of damage and loss of use for LEED®-rated buildings in Hurricane Sandy was significant. The resulting debris and the quantity of resources required to rebuild underscored the need to consider the impact of a building's natural hazard performance and resilience.



A house damaged in Hurricane Sandy.

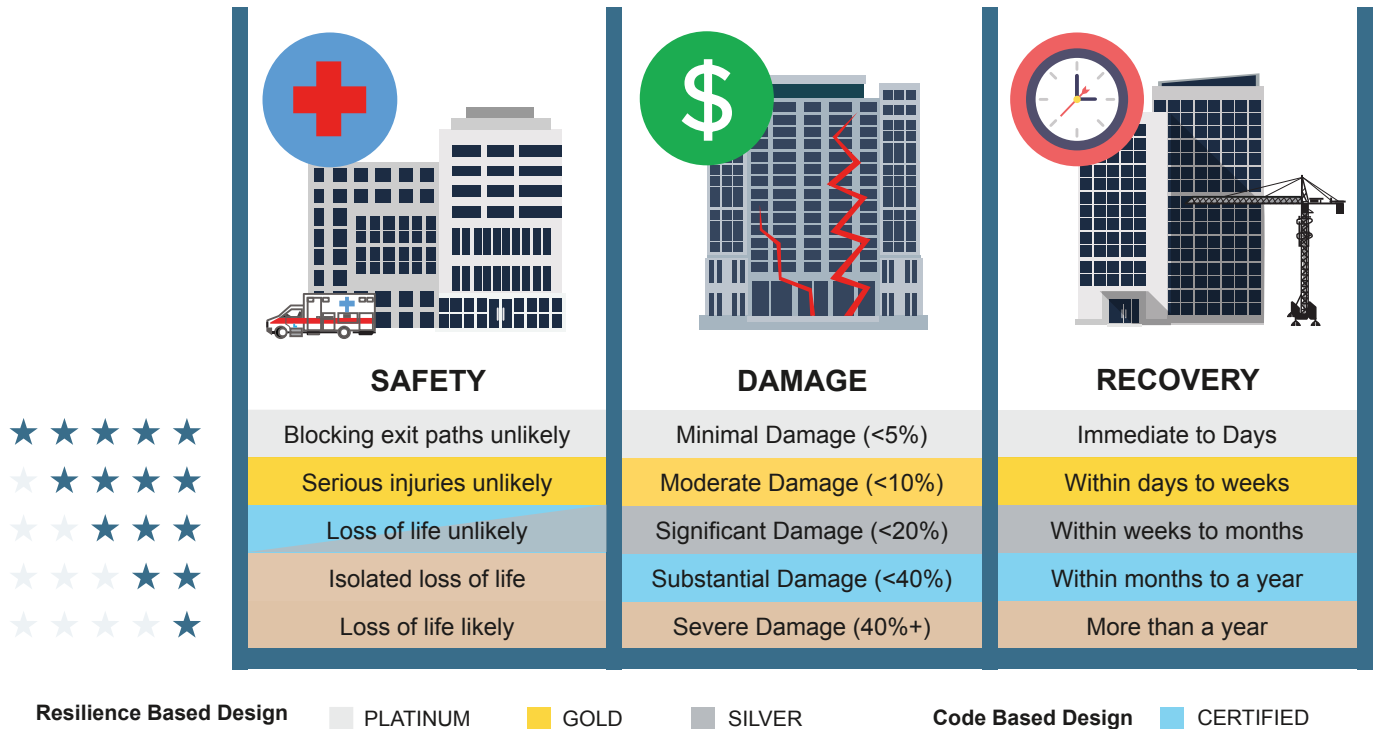
Better Earthquake Performance Doesn't Have to Significantly Increase Costs

Repair costs for Platinum and Gold (five and four-star rated buildings) are likely to be less than the deductibles on most earthquake policies. The savings on insurance premiums can pay for the additional construction costs to achieve a higher building rating. A five-star recovery rating provides better "insurance" against business interruption costs than the unpredictability of claims adjustment. In highly seismic areas earthquake insurance may not be offered, making a high performing building your best insurance against costly repairs. For a new building, a seismic design that results in a platinum five-star performance rating may only add 1% to 5% to total up front construction costs, or about as much as a typical contingency budget.



Example of results on repair time and repair cost for different design options.

USRC Building Rating System: Usefulness of Performance Metrics



USRC Safety Rating

The USRC SAFETY rating dimension reflects the expected performance of the building in terms of loss of life, injury and egress. A USRC SAFETY rating in this context is an indicator of the risk of personal injuries of various types and seriousness, as well as loss of life.

USRC Damage Rating

The USRC DAMAGE rating dimension reflects an estimate of the cost to repair the building after an event, as a percentage of the building's overall replacement cost (not including the replacement of contents), such that it can continue to be used as it was at the time the rating was last issued.

DAMAGE is determined without consideration of overall market conditions in effect following the event, such as increases in local construction costs, and it does not include factors such as business interruption associated with loss of use or occupancy restrictions, design fees, permit fees, historic preservation, or mandatory upgrades triggered by building code regulations.

USRC Recovery Rating

The USRC RECOVERY dimension is an estimate of the time until a property owner or tenant is able to enter and use the building for its basic intended functions. It represents a minimum timeframe to carry out needed repair and to remove major safety hazards and obstacles to occupancy and use, but does not address several other factors that can delay the time to regain function, including but not limited to: the condition of external infrastructure (e.g. utilities, transportation) that provide access and services to the building; damage or the post-event state of building contents; or the condition of adjacent buildings.

The complexity and time needed to restore a building to usable condition can increase quickly in relation to the degree of damage. Delays in design, financing, and construction may include time until arrival of special-order equipment or materials, increased prices, a lack of available local design professionals or contractors in a community where many buildings have been damaged, and longer than usual permitting and inspection wait times.