

## 2008 National Awards in Excellence

### Mitigation

Utah State Capitol Seismic Retrofit and Restoration

Capitol Preservation Board

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The State of Utah's elegant Capitol building was dedicated in 1916. With a 165-foot-high rotunda, marble Corinthian and Ionic columns, and granite façade, the building is a cherished civic symbol and state historic landmark. In 1998, the State formally began plans to revitalize the building through a multi-phased renovation and restoration program that will ensure the safety of the building's occupants, improve its functional usefulness, and preserve its historical legacy.

One of the project's objectives is to improve seismic capacity while maintaining the Capitol building's historic appearance. The teams working on the Capitol building have introduced a variety of modern solutions to bolster its structural integrity and seismic capacity while respecting its architectural aesthetics:

A base isolation system will allow the building to move independently of the ground. The base isolators will absorb much of the horizontal force from an earthquake, thereby reducing potential stress on the building's structure and ornamentation. A series of new concrete shear walls will be added to the building to provide stiffness, which will reduce potential movement in the structure and concentrate it within the isolators. The shear walls will be hidden in abandoned vent shafts, rotunda/dome support piers, and elevator and stair shafts to minimize visual impact.

During a seismic event, the combination of base isolation with new shear walls is expected to reduce potential force on the building to less than one fourth of its previous unreinforced impact.

The planning process of this project began in 1998 with construction on the Capitol starting in 2002. The base isolation portion of the Capitol restoration was completed in April of 2007 with the rededication ceremonies occurring on January 4, 2008.

This seismic retrofit can be applied to other states with similar seismic risk. The main issue will be cost. In addition to the Capitol retrofit, the state built two new office annexes to house state government while the Capitol was being restored at a cost of over \$36 million dollars. The seismic retrofit and restoration costs exceeded \$200 million dollars.