

10. Seismic Design

Context & Character

Most historic buildings were constructed when little was known about seismic design thus increasing their vulnerability in the event of an earthquake. Modern technologies, however, have made it possible to retrofit historic buildings to improve their ability to withstand such an event. Upgrades to foundations, floors, ceilings, walls, columns, and roofs can greatly improve a building's resistance to seismic activity.

Design Objective

If a seismic upgrade to a historic building is considered, it should be sensitive to historic architectural features and building materials.

General

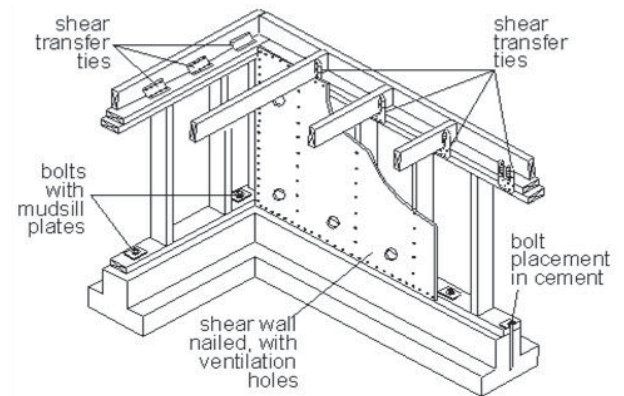
10.1 Historic materials should be preserved and retained to the greatest extent possible.

- The wholesale replacement of historic material should be avoided.

10.2 The architectural integrity of a historic building should be respected with seismic work that is sensitive to its historic appearance.

- New seismic systems should be installed to be compatible in design with the historic building.

CONTEXT & CHARACTER	10 : 1
DESIGN OBJECTIVE	10 : 1
GENERAL	10 : 1
ADDITIONAL INFORMATION	10 : 2



Typical seismic retrofitting includes reinforcing the foundation through added ties, bolts and plates.



Seismic retrofitting can include adding steel frames and dampers in basement and parking areas of commercial buildings.

10.3 Seismic retrofitting of a historic building should be undertaken in a manner that will not damage structural systems or character-defining architectural features.

- Materials used in seismic retrofitting should be located on the interior and/or blend with existing architectural features.
- Unavoidable alterations should be repaired with compatible materials and techniques.

10.4 Seismic work should be “reversible” to the greatest extent possible.

- This will allow for traditional repair of remaining historic materials, and provide an opportunity for the application of future improved systems.

Additional Information

Utah Division of State History, Office of Preservation. “Bracing for the Big One: Seismic Retrofit of Historic Houses,” 1993 history.utah.gov/historic_buildings/information_and_research/bracing_for_the_big_one.html

“Controlling Disaster: Earthquake-Hazard Reduction for Historic Buildings.” *Information Series*, National Trust for Historic Preservation, 1785 Massachusetts Avenue, NW, Washington DC 20036. 1992 www.preservationbooks.org/Bookstore.asp?Type=epolicy&Item=1172

Look David W., Terry Wong, PE and Sylvia Rose Augustus, *Preservation Briefs 41: The Seismic Retrofit of Historic Buildings: Keeping Preservation in the Forefront*. Washington, DC: Technical Preservation Services, National Park Service, U.S. Department of the Interior. 1997 www.nps.gov/history/hps/tps/briefs/brief41.htm