



Critical Facility Seismic Mitigation

Full Mitigation Best Practice Story

Los Angeles County, California



The State of California - Many States and communities over the years have decided that it is in their best interest to begin mitigating the natural hazard risks posed to critical facilities, such as hospitals. A prominent example of such mitigation can be found in the case of the Los Angeles Olive View Medical Center, in California. The 850-bed Los Angeles Olive View Medical Center, which cost approximately \$23.5 million to build, was dedicated in November 1970. The Center was built according to the 1965 Los Angeles Building Code, which did not contain many of the seismic protection provisions found in the 1973 building code.

In 1971, the San Fernando Earthquake destroyed most of the building, caused three deaths on-site, and forced the evacuation of the structure. When the hospital was replaced in 1988, it was designed and constructed to new statewide performance standards and enforcement procedures for hospitals intended to maintain functionality following earthquakes. The cost of replacement was \$48 million (1988 dollars).

The new seismic provisions proved worthwhile when the Northridge Earthquake struck the Los Angeles area in 1994. In that event, the Olive View Medical Center sustained only minor damage totaling \$6.6 million, or 11 percent of the total replacement cost (\$60 million in 1996 dollars). Furthermore, the building damage sustained in 1994 was repairable and the facility was fully operational within 4 weeks, which was not the case with the 1971 earthquake. The valuable medical services provided by Olive View continued to benefit the community.

This case illustrates the value of seismic mitigation for hospitals in areas of high earthquake risk. Because of successes such as Olive View, FEMA has established a program to encourage such mitigation. After the Northridge Earthquake, the Seismic Hazard Mitigation Program for Hospitals (SHMPH) created an optional alternative to the Damage Survey Report (DSR) process that FEMA traditionally uses to calculate the amounts of disaster assistance to be given to public facilities after disasters. The program is designed to accommodate hospital facilities that were structurally damaged in the Northridge Earthquake, and that were constructed prior to 1973 when California established special seismic safety regulations for hospital construction. The SHMPH provides funding specifically for mitigation measures that are likely to significantly improve a building's seismic performance. These funds are provided on a Federal/non-Federal cost-share basis.

Approximately 22 hospital complexes in the 3-county Northridge Earthquake disaster zone are eligible for participation in the SHMPH. It is expected that more than \$2 billion in Federal, State, local, and private funds will be expended in this mitigation program over a period of up to 15 years, and that more than 50 percent of these funds will be used to construct new, updated hospital buildings, which will serve to improve health care delivery in times of disaster.

Activity/Project Location

Geographical Area: **Single County in a State**

FEMA Region: **Region IX**

State: **California**

County: **Los Angeles County**

City/Community: **Los Angeles**

Key Activity/Project Information

Sector: **Public**
Hazard Type: **Earthquake**
Activity/Project Type: **Building Codes**
Activity/Project Start Date: **01/1988**
Activity/Project End Date: **01/1990**
Funding Source: **Other FEMA funds/ US Department of Homeland Security**
Funding Recipient: **Critical Facility - Medical**
Funding Recipient Name: **Los Angeles Olive View Medical Center**

Activity/Project Economic Analysis

Cost: **\$48,000,000.00 (Estimated)**

Activity/Project Disaster Information

Mitigation Resulted From Federal Disaster? **Yes**
Federal Disaster #: **299 , 02/09/1971**
Value Tested By Disaster? **Yes**
Tested By Federal Disaster #: **No Federal Disaster specified**
Year First Tested: **1994**
Repetitive Loss Property? **Unknown**

Reference URLs

Reference URL 1: <http://neic.usgs.gov/>
Reference URL 2: <http://www.oes.ca.gov/Operational/OESHome.nsf/1?OpenForm>

Main Points

- Hospital was replaced in 1988, designed and constructed to new statewide performance standards and enforcement procedures for hospitals intended to maintain functionality following earthquakes.
- The new seismic provisions proved worthwhile when the Northridge Earthquake struck the Los Angeles area in 1994.
- After the Northridge Earthquake, the Seismic Hazard Mitigation Program for Hospitals (SHMPH).
- Approximately 22 hospital complexes in the 3-county Northridge Earthquake disaster zone are eligible for participation in the SHMPH.