



## Seismic Retrofit of Fire Stations

### Full Mitigation Best Practice Story

#### *Orange County, California*



**Orange County, CA** - The Orange County Fire Authority (OCFA), one of the largest regional fire service organizations in California, identified the seismic vulnerability of 22 fire stations throughout the Orange County area. OCFA provides fire suppression, emergency response medical, rescue, and fire prevention services. Its service area covers 511 square miles, protecting more than 1.1 million residents. The OCFA has 20 automatic and mutual aid agreements with other jurisdictions for use of assignments of resources in the event of major emergencies.

Structural and non-structural seismic retrofit of all the fire stations located within the OCFA jurisdiction was completed. Strengthening included wood shear wall installation; anchor bolts and hold downs at the existing plywood shear walls; foundation bolting, metal shear clips and nailing at the roof-to-wall interface; steel brace frames and grade beam footings next to each apparatus door; removal and replacement of damaged roof structures; and sprinkler system installation. Asbestos abatement was also done at the same time.

Given California's continuous string of disasters, it is vital to improve building integrity in order to ensure safety of employees and maximum performance of all operations. Structural and non-structural seismic retrofit of all the fire stations located within the OCFA jurisdiction was completed.

#### Activity/Project Location

Geographical Area: **Single County (County-wide)**  
 FEMA Region: **Region IX**  
 State: **California**  
 County: **Orange County**

#### Key Activity/Project Information

Sector: **Public**  
 Hazard Type: **Earthquake**  
 Activity/Project Type: **Retrofitting, Non-structural; Retrofitting, Structural**  
 Activity/Project Start Date: **02/1997**  
 Activity/Project End Date: **Ongoing**  
 Funding Source: **Local Sources**  
 Funding Recipient: **Critical Facility - Police/Fire**  
 Funding Recipient Name: **Orange County Fire Authority**

### Activity/Project Economic Analysis

Cost: **\$2,764,476.00 (Actual)**

### Activity/Project Disaster Information

Mitigation Resulted From Federal  
Disaster? **No**

Value Tested By Disaster? **Unknown**

Repetitive Loss Property? **Unknown**

### Reference URLs

Reference URL 1: <http://www.nfpa.org/>

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

### Main Points

- Structural and non-structural seismic retrofit of all the fire stations located within the OCFA jurisdiction was completed.
- Strengthening included wood shear wall installation; anchor bolts and hold downs at the existing plywood shear walls; foundation bolting, metal shear clips and nailing at the roof-to-wall interface; steel brace frames and grade beam footings next to each apparatus door; removal and replacement of damaged roof structures; and sprinkler system installation. Asbestos abatement was also done at the same time.
- Structural and non-structural seismic retrofit of all the fire stations located within the OCFA jurisdiction was completed.