



Public School Retrofit Program

Full Mitigation Best Practice Story

King County, Washington

Lake Washington, WA - It was April 29, 1965, when the last major earthquake struck western Washington State. While aware of the possibility of another event, locals had been lax in their efforts to secure properties and buildings. With population growth over the years, and the building of more schools in the Lake Washington School District, parents and district staff members began vocalizing their concern about the possibility of earthquake and what would happen to their children in such an event.



In early 1992, local engineers took a look at the school buildings to assess the safety of each one. Because schools did not have a lot of money, local funds would be used, so a matrix was developed to help devise a plan. The plan would help determine dollars needed to complete structural and non-structural projects found necessary for seismic retrofit.

The issue was addressed with great enthusiasm, prompting the school district, which included Kirkland, Redmond and parts of King County, Washington, to impose a construction levy on the 1992 general election ballot to raise funds for seismic upgrades, a safety program, and also an Americans with Disabilities Act (ADA) program. A two year levy was initiated in 1996 and a four year levy in 1998 with total funds, for retrofit alone, in the amount of approximately \$6 million. Since the funds are issued in six months allotments, the focus was on seismic structural bracing first, then non-structural mitigation in the buildings found in need of upgrades. All projects to date are complete.

On February 28, 2001, mitigation and safety measures in the Lake Washington School District were put to the test when a strong 6.8 earthquake struck the Nisqually Basin and Puget Sound area of western Washington. Most of the schools in the district are built on a liquefaction zone which caused the ground to "roll like jelly," said Forrest Miller, Director of Support Services for the School System. "The buildings were all tested and nothing failed. The only thing that fell was one light fixture in the oldest building which was built in 1952."

There are several successes to this story. Mr. Miller stated he is "so impressed with the people in this district who got things done!" Because of their vision and perseverance, lives as well as millions of dollars were saved. Due to their on-going safety drills, the children and teachers were well trained, and were actually training the adults on what to do.

Custodians and other appropriate employees have received the Applied Technology Council (ATC) Training, which teaches rapid visual assessment of interior structures. Immediate inspection can be done after an incident, which, in this case was instrumental in allowing classes to resume with minimal loss of time. Teachers and other school employees were tested beforehand to determine responsibility during earthquake and fire drills so every student would be accounted for and in their pre-decided location.

The benefits are many. There are 25,000 students in the Lake Washington School District, which is the fifth largest in the state of Washington. There was no loss of life or injury, and 40 buildings in the district were saved from earthquake harm by either new construction or seismic retrofit. To construct a new school building today would cost at least \$36 million, and to find temporary housing for classrooms in case of damages would have cost thousands.

This is a case of being prepared through efforts prompted by concerned parents and staff members. The overall success combines continuing emergency preparedness training, funding through a community tax levy and implementation of mitigation techniques. The investment is lifesaving and creates sustainability.

Activity/Project Location

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

FEMA Region: **Region X**

State: **Washington**

County: **King County**

City/Community: **Redmond**

Key Activity/Project Information

Sector: **Public**

Hazard Type: **Earthquake**

Activity/Project Type: **Retrofitting, Non-structural; Retrofitting, Structural**

Activity/Project Start Date: **08/1996**

Activity/Project End Date: **Ongoing**

Funding Source: **Local Sources**

Funding Recipient: **Critical Facility - School**

Funding Recipient Name: **Lake Washington School District**

Activity/Project Economic Analysis

Cost: **\$6,000,000.00 (Estimated)**

Activity/Project Disaster Information

Mitigation Resulted From Federal
Disaster? **No**

Value Tested By Disaster? **Yes**

Tested By Federal Disaster #: **No Federal Disaster specified**

Year First Tested: **2001**

Repetitive Loss Property? **Unknown**

Reference URLs

Reference URL 1: **<http://neic.usgs.gov/>**

Reference URL 2: **<http://emd.wa.gov/>**

Main Points

- A case of being prepared through efforts prompted by concerned parents and staff members.
- There was no loss of life or injury, and 40 buildings in the district were saved from earthquake harm by either new construction or seismic retrofit.
- The overall success combines continuing emergency preparedness training, funding through a community tax levy and implementation of mitigation techniques.