Should we better prepare for earthquakes?

December 15 2011

University of Adelaide researchers are leading an international project to help identify buildings most vulnerable to earthquakes and the best ways to strengthen them.

Chief Investigator Professor Mike Griffith, from the University's School of Civil, Environmental and Mining Engineering, says the model will help determine priorities for strengthening the more susceptible unreinforced masonry buildings.

The team, including researchers from the University of Auckland in New Zealand and the University of Pavia in Italy, is using data on building damage collected in Christchurch following the earthquakes in February 2011 and September 2010 as part of their work for the Canterbury Earthquakes Royal Commission.

"We are taking what we observed and learned from Christchurch to assess the level of risk posed by earthquakes to masonry buildings generally," said Professor Griffith.

"We are also looking at the unreinforced masonry buildings in Christchurch that had some seismic strengthening to see how those buildings behaved in the September and February earthquakes in order to identify which retrofitting schemes were more effective than others."

Professor Griffith said New Zealand and Australia were both settled around the same time with many buildings built before the 1930s with similar styles of construction.

"Hence, the Christchurch earthquakes give us a unique opportunity to learn how to prevent widespread damage to heritage construction in future earthquakes," he said.

New Zealand stopped building masonry buildings after the major 1931 Hawke's Bay earthquake, but this style of construction continued in Australia and many people are still renovating and living in this type of building – some are heritage listed.

Work to date has shown that buildings strengthened to about one-third of modern building standards offered no significant protection against the Christchurch earthquake. Buildings that were strengthened to two-thirds of new building requirements showed significant reduction in damage.

"These higher level strengthening schemes are more invasive and obviously come at much higher cost," said Professor Griffith. "We want to be able to calculate how much improvement we can achieve by strengthening schemes and at what cost – a cost/benefit ratio for retrofitting buildings against earthquake damage."

The model will be applicable for different building construction styles used around the world. The research project won funding under the latest round of Australian Research Council Discovery Projects for funding from 2012.

Provided by University of Adelaide