



Kaikoura Earthquake Technical Clearinghouse

Meeting #1 – Summary

Held at the Royal Society of New Zealand, Wellington, 16 November 2016

Purpose of Meeting

The purpose of this, the first, Kaikoura Earthquake Technical Clearinghouse meeting was to share information learned from inspections and assessments of buildings in the initial days following the earthquakes as part of establishing a wider understanding of the range of impacts across different types of buildings.

These ‘Technical Clearinghouse’ meetings are routinely organised following significant events, and were regularly held for several years following the Canterbury earthquakes, and following the 2013 Seddon earthquake. Individual buildings were not discussed at this meeting.

The Clearinghouse meeting was organised by the New Zealand Society for Earthquake Engineering (NZSEE), the Structural Engineering Society (SESOC) and the New Zealand Geotechnical Society (NZGS), and Quake CoRE. The nearly 200 attendees were mostly structural and geotechnical consulting engineers, together with staff from WCC, CDEM, GNS Science, USAR, and Auckland, Victoria, and Massey Universities.

Key Points from the Presentations and Discussion

- Ken Gledhill, GeoNet programme manager, advised that the Kaikoura earthquake was a very large and complicated earthquake, upgraded yesterday to M7.8.
- International seismologists are saying that this is the most complex earthquake recorded. It involved discrete movements on a number of faults in the upper South Island from near Cheviot to Seddon.
- The earthquake rupture sequence had a duration of strong ground shaking of about 90 seconds, and caused significant ground deformation including coastal uplift of several metres of the Kaikoura coast from Cape Campbell to south of Kaikoura. This caused the consequent tsunami.
- A panel of engineering Principals (Rob Jury, *Beca*; Hamish McKenzie, *Holmes*; Adam Thornton, *Dunning & Thornton*; John Finnegan, *Aurecon*; Ray Patton, *Clendon Burns & Park*; and Stuart Palmer, *Tonkin+Taylor*) outlined their observations of damage across Wellington’s buildings and their assessment procedures.
- Given the earthquake magnitude and the duration of shaking, engineers are generally surprised how little major structural damage there was in Wellington when taken across all of the buildings. The damage observed was greater in medium-rise buildings (eg 8 to 14 storeys) due to the characteristics of the earthquake, and worse in areas of softer soils.
- There was however considerable non-structural damage, such as the dislodgement and falling of internal ducting, ceiling tiles and glazing, an important aspect of buildings that designers and constructors are aware, from other recent earthquake events, is in need of greater effort in design and co-ordination.

- The issue of how to address the residual capacity of buildings that have experienced some structural damage is complex – both technically and in communicating the risk – and needs specific consideration.
- Due to the nature of the ground shaking, most older short buildings, including some earthquake prone buildings and unreinforced masonry buildings, have not suffered any significant damage. However, there is a need to avoid complacency of owners (and engineers) about the performance of these buildings with known vulnerabilities as they weren't tested in either this earthquake or the 2013 Cook Strait earthquakes.
- A publicly accessible virtual clearinghouse has been established, with assistance from the Earthquake Engineering Research Institute (EERI), NZSEE, NZGS, and Tonkin + Taylor, see – <http://www.eqclearinghouse.org/2016-11-13-kaikoura/>

Agreements and Actions from Meeting

Acknowledgement that the Kaikoura Earthquake Technical Clearinghouse has a key role to play in:

- facilitating the exchange of information amongst engineers;
- facilitating the exchange of information between engineers and the territorial authorities;
- augmenting the efforts of affected territorial authorities; and
- facilitating the exchange of information amongst researchers and between them, engineers, and the territorial authorities

Next Kaikoura Earthquake Clearinghouse Meeting

Clearinghouse Meeting #2, Wellington, Wednesday 23 November 17:30, James Cook Hotel