

Mary-Ann Hutton

From: Willie Palmer [willie.palmer@buddlefindlay.com]
Sent: Friday, 15 June 2012 5:34 p.m.
To: Stephen Mills; Mark Zarifeh; Marcus Elliot; Sara Jamieson
Cc: Kelly Paterson; a.carr@civil.canterbury.ac.nz
Subject: CTV - NLTHA expert panel
Attachments: Major_aftershocks_Sept10_to_Feb11.pdf

Importance: High

Dear All,

Further to my email below on the ERSA draft directions, there is an issue arising in relation to the NLTHA currently before the expert panel.

NLTHA Issue

Noting that the earthquake events listed in paragraphs 4.1.2 and 4.1.3 of the draft directions (4 September 2010 and 22 February 2011), these events are far better included in the NLTHA panel analysis, which I understand they are. However, those two earthquake events alone would seem to be inadequate. Between 4 September 2010 and 22 February 2011 there were many additional earthquakes of a magnitude in the range of the Boxing Day earthquake (4.91) or higher. All of these earthquakes had the potential to contribute to the cumulative fatigue initiated by the first 4 September 2010 earthquake at 4.35am. In fact many of the aftershocks of such magnitude occurred on the same day (4 September) and immediately following days, along with other dates prior to 22 February.

By way of example I **enclose** a list of the major earthquakes of magnitude 5 and above (plus the Boxing Day earthquake) in the relevant period. This list is compiled from: <http://www.geonet.org.nz/canterbury-quake/significant.html>. For the list in question currently very few of the records are available on the GeoNet ftp site. Therefore, it is not possible for me to indicate the peak ground accelerations across the city without access to these records. No doubt this information is readily available to those more familiar with use of the records than me. The GeoNet reference numbers are included in the attached pdf. However, in the context of a magnitude 7.1 earthquake on 4 September 2010 at 4.35am, causing damage arguably at design level to the CTV Building, the list illustrates that there are other material earthquakes that need to be taken into account in any NLTHA analysis.

Action required

Accordingly, on behalf of ARCL we suggest that the NLTHA expert analysis should include modelling of the significant earthquake events between 4.35am on 4 September 2010 and 22 February 2011 so that the cumulative fatigue effect can be considered. Working from the attached list obviously more data from GNS will need to be obtained as to the PGAs and responses. I am copying this email to Professor Carr so that he is aware of this request.

Again, I am happy to discuss any of the above and look forward to your response.

Regards
 Willie

From: Willie Palmer
Sent: 14 June 2012 5:15 p.m.
To: Stephen Mills; Marcus Elliot; Mark Zarifeh; Sara Jamieson
Cc: Kelly Paterson
Subject: CTV - ERSA draft directions

Dear All,

ARCL is prepared to be a party to the ERSA expert panel, if it proceeds, with the ARCL experts you have identified in paragraphs 2.5 to 2.8.

However:

1. With reference to the draft directions at paragraph 4.1.1, it is not clear why there is reference to NZS3101:1982. There would seem to be no place for consideration of this code in the analysis.

Accordingly, the reference to NZS3101:1982 should be deleted.

2. With reference to the draft directions at paragraphs 4.1.2 and 4.1.3, these objectives seem to have no utility. ERSA is a design method only and is not appropriate for assessing the performance / response of an actual structure in an actual earthquake event.

Accordingly, paragraphs 4.1.2 and 4.1.3 of the draft directions should be deleted.

I am happy to discuss any of the above.

In due course please let us know how the Royal Commission intends to proceed.

Regards
Willie

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GeoNet Reference Number	Date (local time)	Magnitude
3366155	Sat, Sep 4 2010 4:56 am	5.3
3366230	Sat, Sep 4 2010 7:56 am	5.2
3366310	Sat, Sep 4 2010 11:12 am	5.3
3366313	Sat, Sep 4 2010 11:14 am	5.3
3366452	Sat, Sep 4 2010 4:55 pm	5.4
3367742	Mon, Sep 6 2010 11:24 pm	5.2
3367749	Mon, Sep 6 2010 11:40 pm	5.4
3367832	Tue, Sep 7 2010 3:24 am	5.4
3368445	Wed, Sep 8 2010 7:49 am	5.1
3382676	Mon, Oct 4 2010 10:21 pm	5.0
3388384	Wed, Oct 13 2010 4:42 pm	5.0
3391440	Tue, Oct 19 2010 11:32 am	5.0
	Sun, Dec 26 2011 10:30 am	4.9
3450113	Thu, Jan 20 2011 6:03 am	5.1

This list is compiled from the GeoNet webpage (<http://www.geonet.org.nz/canterbury-quakes/significant.html>) and do not represent all of the aftershocks between September 4, 2010 and February 22, 2011.

