Under **THE COMMISSIONS OF INQUIRY ACT 1908**

In the matter of the **CANTERBURY EARTHQUAKES ROYAL COMMISSION OF INQUIRY INTO THE COLLAPSE OF THE CTV BUILDING**

BRIEF OF EVIDENCE OF CHRISTOPHER RICHARD URMSON

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BRIEF OF EVIDENCE OF CHRISTOPHER RICHARD URMSON

1. My full name is Christopher Richard Urmson. I reside in Christchurch. I am a Structural Engineer.

2. I am employed by Alan Reay Consultants Limited ("**ARCL**"), an affected party in this Royal Commission hearing.

Qualifications and experience

3. I hold a Bachelor of Engineering with Honours (2007, University of Canterbury) and a Master of Science (2010, Texas A&M University). I am a Graduate Member of the Institution of Professional Engineers New Zealand.

Instructions for column sampling

4. On Thursday 12 April 2012, John Mander, Doug Latham and I went to the Burwood landfill where the remains of the CTV Building are stored. We examined the remnants of the columns and Professor Mander instructed us as to what we should do to prepare columns for testing at the University of Canterbury.

5. His instructions were that we should cut up one specimen (Column C5) which was a top floor column (as shown by the bolts sticking out of the top) and relatively undamaged. We were to aim for three specimens from this column, with a length of 1200mm for each column (diameter roughly 400mm). The ends were to be cut as cleanly and as flat as practicable.

6. We were also to prepare a specimen from Column C13, which possibly came from lower down in the building and was considerably more damaged. Only one specimen would be able to be extracted from this remnant, with a length shorter than 1200mm; it was envisaged that the ends would somehow be repaired and built up to enable testing.

7. Thirdly, we were to obtain a few of the "doughnuts" left over from the core sampling earlier commissioned and carried out by ARCL.

Column sampling and collection

8. On 1 May 2012 I returned to the Burwood site to carry out the sampling in accordance with Professor Mander's instructions. The site supervisor and James Mackechnie were present throughout the process. ARCL engaged Vertec to cut up the specimens using a concrete saw.

9. The columns were cut as follows:

   (a) **Column C5:**
   Original length, 2800mm
   Cut length (top): 1220mm +-10mm
   Cut length (bottom): 1220mm +-10mm
   Top and bottom of column were removed to make flat.
   Overall, cutting took about half an hour.

   (b) **Column C13:**
   Original length varies (see photos)
   Cutting was mainly through stubs of reinforcing steel to tidy up the ends as much as possible.
   Cutting took approximately 5 minutes overall.

10. The above samples, together with "doughnuts" from columns C1T, C4, C1B, C6 and C12 were carefully transported from the Burwood site to the Civil Engineering Department at the University of Canterbury by Hilton Haulage. All concrete was wrapped in carpet and firmly held in place with stropping and dunnage. I followed the truck for the entire route and supervised its unloading at door 5 in the main structures laboratory at the University.

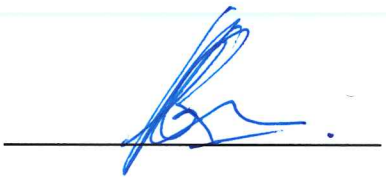
11. The columns were then handed over to Professor Rajesh Dhakal of the Department of Civil Engineering.

Testing

12. I observed the first test on Thursday 17 May and the second test on 24 May 2012. The tests were carried out by Professor Dhakal. James Mackechnie was also present for both tests.

13. I understand a third test is still to be conducted.

Dated this 31st day of May 2012



C R Urmson