

**IN THE MATTER OF  
THE CANTERBURY EARTHQUAKES ROYAL COMMISSION**

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**BRIEF OF EVIDENCE OF NOEL RICHARD HANHAM**  
**29 November 2011**

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**Duncan Cotterill**  
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1. My name is Noel Richard Hanham.
2. I am a director of T H Consultants Limited, consulting civil and structural engineers, and I am a Chartered Professional Engineer. I hold a Bachelor of Engineering with first class honours from Canterbury University and a New Zealand Certificate in Engineering. I am a fellow of the Institution of Professional Engineers New Zealand. I have 45 years experience in the building industry with 37 of those years as a professional engineer.
3. On 27 January 2011 Mr Hiten Patel contacted me by telephone in relation to the building located at 595 Colombo Street. Mr and Mrs Patel are the owners of the building. Hiten Patel is their son. The Patels wanted me to investigate the extent of the damage that had occurred as a result of recent seismic activity to see whether there were any immediate safety concerns associated with the building. They did not want a detailed inspection and as such my inspection was limited to a visual inspection only. The Patels confirmed my engagement by email on 27 January 2011.
4. I inspected the building on 28 January 2011. This was the first time that I had inspected the building. The inspection lasted approximately one hour (including 20 minutes spent walking along the street and viewing the exterior of the building).
5. The building is a 2-storey commercial premises constructed of unreinforced brick walls and timber floors. No structural strengthening was apparent compared with the shop next door which had a steel portal in place. I asked the Patels whether they had received any notices or correspondence from the Council about earthquake prone buildings to which they said they had not. I also asked whether they had any plans available. They told me that they did not. I did not request a copy of building plans from Council because that can take up to a week and such delay is not appropriate where an immediate assessment of the safety of a building is required. Further, given the age of the building any plans were likely to be of limited assistance.
6. At the time of my inspection the Patels advised that an inspection had not been carried out after the September earthquake. I assumed that there would have been some form of Level 1 Assessment undertaken by the Council/Civil Defence although I was unable to confirm this. There were no signs of any placards. The

Patels were unable to recall what colour placard, if any, the building had following the September event. Ultimately what placard was issued following a Level 1 Assessment was not going to be relevant to the "immediate safety" assessment that I had been instructed to undertake.

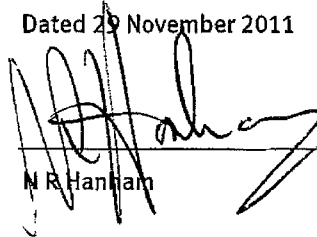
7. My overall impression was that the Patels were not sure of the extent of the damage to the building or when the damage had occurred. I understood that they had had very little access to the building since the earthquakes. At the time I visited the building the tenant's business was open for business but as there were customers in the cafe I was unable to speak directly to the tenants.
8. The Patels told me that a number of window panes had broken but they had since been repaired. The Patels also told me the recent earthquakes had caused some cracking to occur but that the tenants had carried out some work to fill the internal cracks. It was obvious to me that subsequent aftershocks had caused further damage to the building since the repairs because there were cracks in the repair work. It was also obvious that damage had been caused to the first floor ceiling and partition walls.
9. At the time of my inspection, there was no specific information for engineers relating to inspections after a seismic event, other than the New Zealand Society for Earthquake Engineering Building Safety Evaluation Guidelines. I carried out my inspection as a Level 2 Rapid Assessment. A Level 2 Rapid Assessment is meant to identify initial structural and safety issues. It is a visual inspection only and not intended to provide detailed information on all repairs. It is focussed on immediate public safety as well as assessing the need for any temporary works such as shoring, temporary securing or making safe.
10. I took into account the impact of the earthquake on 4 September 2010 on the structural integrity of the building as well as the subsequent aftershocks. Information from GNS or any other sources about the likelihood, location and extent of further aftershocks was not used in the production of my report. My recollection is that I did not at that time have any particular knowledge of GNS predictions. There was limited information available prior to February's earthquake. What information there was available tended to focus on the liquefaction effects.

11. I considered that the ground floor remained in a habitable condition. I could see that some repair work had been done but the extent of those repairs was hard to quantify and were not obvious from a visual inspection. I thought that the first floor required repair work to restore it to its pre earthquake condition and that the first floor ceiling presented a potential hazard because of plaster falling off the laths.
12. As there was no evidence of any significant structural damage I did not consider that the building had been severely damaged by the earthquakes. I concluded that the building was in essentially the same structural condition as it would have been prior to the earthquakes. That is, while the building was unlikely to meet the current building code standards, there was no sign of bricks pulling away from the structure for example and the building was essentially safe.
13. After my inspection I recorded my observations in a report dated 3 February 2011 to Mr and Mrs Patel (NH1). I also had a general discussion with the Patels about the conclusions I had reached. Although not recorded in the report I recommended (and Mrs Patel agreed) that the first floor should not be occupied. This recommendation was based on the potential for harm should a person be hit by plaster falling from the laths during further aftershocks. I did<sup>not</sup> consider the risk life threatening.
14. My conclusion about the building was that it was likely to be considered earthquake prone. I had observed that the adjacent building at 595A had some strengthening work in the form of a steel frame installed at some stage. I considered that this frame, by default, would have provided some form of support to the building at 595. This was briefly discussed with the Patels.
15. I did not hear any further from the Patels until 17 November 2011 when Hiten Patel emailed me requesting a copy of the photos taken during my inspection so that they could be provided to the Royal Commission. I provided the photographs to him.

*This statement is true to the best of my knowledge and belief and was made by me.*

*knowing that it may be used as evidence for the purposes of the Royal Commission of Inquiry into the Canterbury Earthquakes.*

Dated 29 November 2011



M R Hanham

NH1



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### **595 Colombo Street, Christchurch, Earthquake Damage**

#### **Scope of Report**

TH Consultants Ltd has undertaken a structural assessment of the building located at 595 Colombo Street, Christchurch.

The scope of this report is to investigate and provide recommendations for the following:-

- Investigate the extent of damage that has occurred to the building as a result of the recent seismic activity.
- Provide an assessment of the structural implications of damage.

Limitations of the report are:-

- Inspection of the structural elements is limited to the exposed portions. Some of the structure is concealed by linings.
- No drawings, of the existing structure, have been available for our review.
- Only the structural aspects, of the New Zealand Building Code, have been considered.
- No detailed design work has been undertaken.

#### **Inspection Time**

An inspection was undertaken on 28 January 2011.

#### **The Earthquake**

The magnitude 7.1 earthquake occurred at 4:36 am on September 4, the epicentre was 40 km west of Christchurch City and the depth of the quake was at 10 km. The epicentre was close to the town of Darfield. It is the most damaging earthquake in New Zealand since the Hawke's Bay earthquake in 1931.<sup>1</sup>

Numerous aftershocks have since occurred in the Canterbury Region, including a number around magnitude 5.0, causing further damage.

In particular a magnitude 4.9 earthquake at 10.30 am on December 26, centred under the city, caused some significant damage to a number of buildings.

<sup>1</sup> <http://www.geonet.org.nz/news/article-sep-4-2010-christchurch-earthquake.html>



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## The Building

The building is a two storey commercial premises

- Unreinforced brick walls
- Timber floors

The building is a mid unit in a series of buildings separated by brick party walls.

## The Building Post Earthquake Condition

The September 4 earthquake caused damage to the building:

- No inspections were made at this time.
- We understand some internal cracking occurred.
  - The extent of damage is unknown
  - Superficial repair work was carried out to fill the internal cracks
- A number of window panes were broken
  - The extent of damage is unknown
  - The windows have been repaired
- Damage occurred to the first floor ceiling
  - The extent of damage is unknown
  - No repair work was carried out

Subsequent aftershocks caused further damage:

- Internal repair work has suffered subsequent cracking
- Further damage has occurred to the first floor ceiling and partition walls

## Damage Observed

- Ground Floor
  - Cracks in walls and ceilings to kitchen
  - Cracks in repair work to restaurant opened up by subsequent events
  - No structural damage evident
- First Floor
  - Some cracks in walls
  - Numerous cracks in ceilings and at junction with walls
  - Large areas of plaster have fallen off the laths to the ceiling and some walls
  - Damage more pronounced at the rear of the building
  - Possible displacement at rear corner of floor
  - No significant structural damage evident
- External Walls
  - Street frontage had no obvious damage
  - Rear wall had some minor cracks
  - Access not obtained to roof or party wall parapets
  - No significant structural damage evident
- Front Verandah
  - Some damage to soffit lining, old water damage opened up by earthquake
  - Support points on brick wall appeared solid
  - No structural damage evident

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**Building Conclusion**

- The building has not been severely damaged by the earthquake.
- There is no evidence of significant structural damage.
- The ground floor remains in a habitable condition.
- The first floor requires repair work to restore to pre-earthquake condition.
- The first floor ceiling presents a potential hazard from plaster falling off the laths.

**Terms of Engagement**

The terms of engagement are to the IPENZ/ACENZ Short Form Model Conditions of Engagement.

For and on behalf of TH Consultants Ltd,

A handwritten signature in black ink, appearing to read 'N R Hanham', is written over a dark, textured rectangular background.

**N R Hanham FIPENZ BE(Hons)**

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