

Brief of evidence of Anthony Francis Raper

I, **ANTHONY FRANCIS RAPER** of Christchurch, Civil and Structural Engineer, state:

1. I hold a Bachelor of Engineering (Civil) (Hons) which I received in 1967 and a Master of Science (Eng) (Concrete Structures and Technology) which I received in 1973. I am a Chartered Professional Engineer (CPEng) and a member of the Institution of Professional Engineers of New Zealand. I have been a member of the New Zealand National Society of Earthquake Engineering since 1974. I have been employed as a civil and structural engineer by Opus International Consultants Limited and its predecessor from 1967 to 1978, and since 2006 as a principal design engineer. Between 1967 and 1971 I practiced as an assistant civil and structural engineer. From 1971 to the present day I have practiced as a structural and civil engineer. I am based in Opus's Christchurch office.
2. I had early career experience in earthquake engineering issues after the 1968 Inangahua earthquake when I was employed by the Ministry of Works Westport Residency as assistant engineer bridges. I was involved in the inspection of civil structures and until 1971 when I moved to the Ministry's Structural Head Office in Wellington, I worked on various remedial repairs to earthquake damaged structures on the west coast.
3. From 6 September 2010 I was involved in post-earthquake building inspections for Opus.
4. On Boxing Day, 26 December 2010, I was requested by Opus to assist the Christchurch City Council with Level 1 rapid assessments of hazardous buildings in the Central Business District. On the afternoon of 26 December, I was part of an inspection team consisting of a CPEng (myself), a City Council representative (Mr Michael Nilsson) and a search and rescue (SAR) representative.
5. On 26 December I carried out an inspection of the building at 605 Colombo Street following a request from the manager of the Khmer Satay Noodle House which operated from that building. The manager wanted an inspection before re-opening the restaurant that evening. When we arrived at the building, the manager, Mr Hout Tan, was not on site, so the inspection consisted of an external visual inspection of the façade of 605 Colombo Street and the external damage to 603 Colombo Street. There was no obvious external façade damage to 605 Colombo Street. The canopy of 605 Colombo Street was already

supported by the addition of steel Acrow props, assumed carried out post-September event, approximately 1 metre inside the footpath curb. Plastic tape was attached between the props. 603 Colombo Street already had a wire mesh temporary fence outside the façade and footpath of Colombo Street and blocking Mollett Street, with a steel pedestrian barrier to separate the pedestrians from the traffic lane. This did not extend to 605 Colombo Street which was posted Green.

6. Following damage observed that afternoon around the CBD, I was concerned about the condition of the external parapet of the front façade of 605 Colombo Street. I discussed this with the inspection team, and consequently the SAR representative proceeded to enquire about the availability of a New Zealand Fire Service (NZFS) snorkel appliance, to get access above and behind the parapet for inspection.
7. The arrival of the NZFS snorkel appliance enabled me, with the assistance of the SAR representative who operated the snorkel arm and platform, to view the external parapet from both the Colombo Street side and from above the roof line of 605 Colombo Street. No horizontal cracking was observed in the parapet itself above roof height, and the parapet was not considered at risk of separating from the facade. Separation between the mutual transverse cross wall between 603 and 605 Colombo Street was observed **[Annexure 2 Photograph 0017]**.
8. After I examined the external parapet, Mr Tan arrived enabling an internal inspection of 605 Colombo Street. Little damage was visible on the ground floor, but cracking of the brick masonry transverse walls from first floor to roof was visible. Mr Tan advised that the cracking appeared to be no worse following the Boxing Day quake and was present after the 4 September quake. The masonry cracks were visible in the middle of the centre transverse wall and at the Colombo Street end of the transverse wall between 603 and 605 Colombo Street. My observation was that the maximum crack width was about 20mm **[Annexure 2 Photograph 0021]**.
9. A Level 1 Rapid Assessment form was completed by Mr Nilsson and me **[BUI.COL603-613.0001.17]**. I included this observation in the form:

FRONT FAÇADE LEANING OUT?

Mr Nilsson noted that the “Parapets above roofline appear to have separated (viewed from the other side by Fire Dept Hoist)”, and after that I added the words:

FROM CROSS WALLS

I also added that the building:

NEEDS CHECK FROM UPPER FLOOR (INTERIOR) OF TRANSVERSE/OUTER FACADE

10. My professional recommendation, as recorded on the Rapid Assessment Form in the section for "Further Action Recommended", was that a detailed structural engineering evaluation was required. This was necessary to check the upper floor transverse wall and façade connections, as the masonry cracking indicated that the front façade could have been leaning outwards, as indicated by the cracking in the mutual transverse cross wall, although this was not obvious from an external view. I recorded that there was only a moderate risk of an overhead falling hazard. This was based on:

- (a) the fact that the transverse masonry wall damage that I was advised had occurred on 4 September 2010 had not significantly changed following the Boxing Day event; and
- (b) the observed non-separation of the overhead parapet and the Colombo Street façade.

For these reasons I considered there was no immediate safety concern requiring any temporary fencing.

11. We advised Mr Tan that he could not open the restaurant for business that evening as it needed a full engineering inspection. The building was posted on 26 December at 17:56 as Restricted Use, Yellow.

12. On return to the Christchurch City Council offices that evening, Mr Nilsson and I handed in the Level 1 Form with the recommended further action for a detailed structural engineering evaluation of the building.

13. The Rapid Assessment Form [**BUI.CAS603-613.0001.17**] has been amended since Mr Nilsson and I filled it in by someone with the initials “RG”, to classify the building as Unsafe, Red.

14. I had no further dealings with this building following the 26 December 2010 inspection.

Dated 20 January 2012

Tony Raper

Attachments:

Annexure 2: Raper Photographs [**605 Colombo Street.pdf**]

Photographs of 605 Colombo Street taken by A F Raper on 26 December 2010

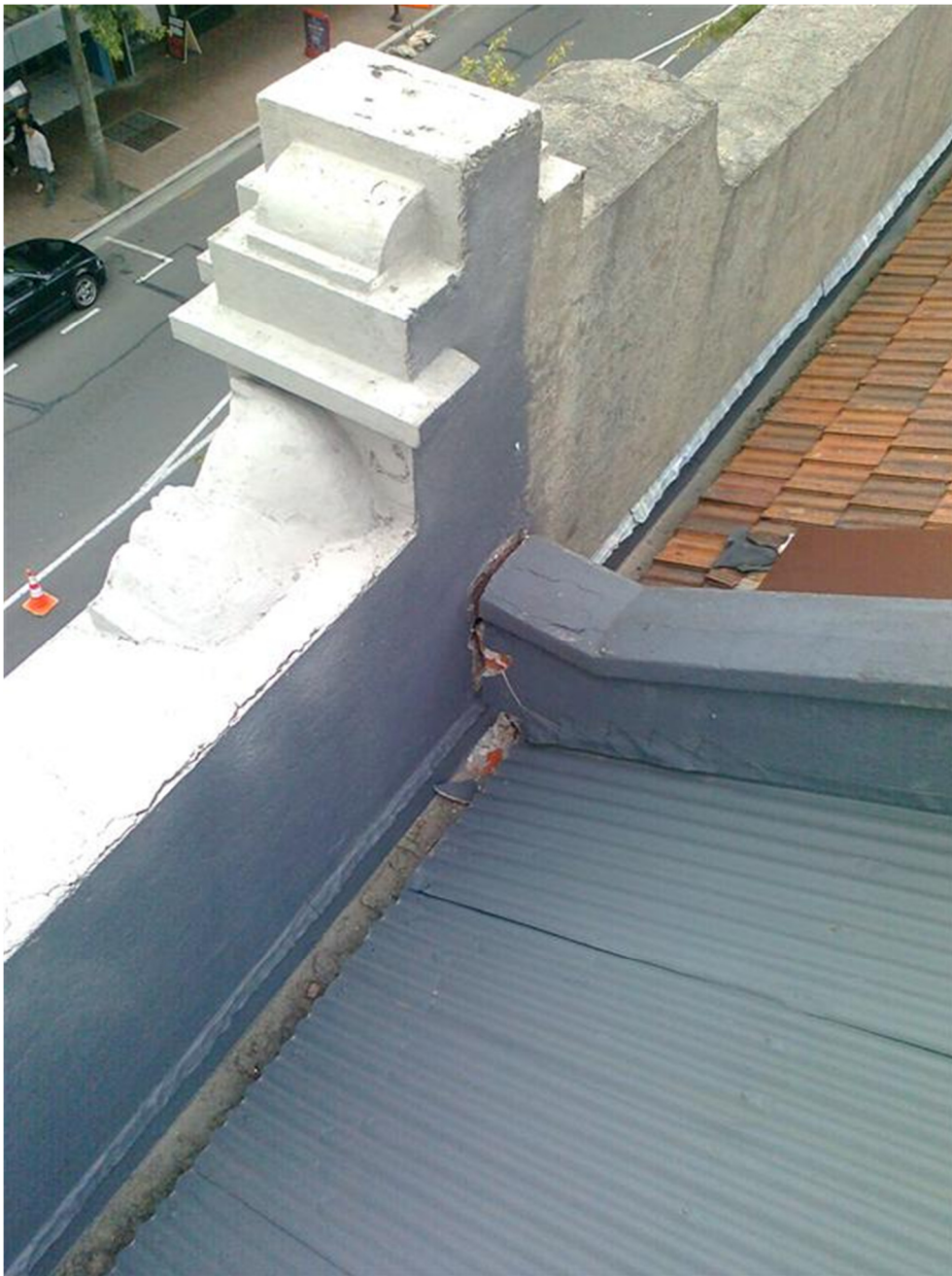


Photo 0017.jpg

605 – 603 Colombo Street parapets and mutual transverse cross wall

Photographs of 605 Colombo Street taken by A F Raper on 26 December 2010



Photo 0018.jpg

Roof of 603 Colombo Street parapets and mutual transverse cross wall

Photographs of 605 Colombo Street taken by A F Raper on 26 December 2010



Photo 0019.jpg

605 – 603 Colombo Street roofs and mutual transverse cross wall

Photographs of 605 Colombo Street taken by A F Raper on 26 December 2010



Photo 0021.jpg

605 Colombo Street - first floor to roof; front wall and mutual transverse cross wall