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File No. General

Mr M Zarifeh  
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Dear Sir

**RE: 595A Colombo Street, Christchurch**

As requested I am writing to explain the structural work completed when this building was altered in 2000.

The Powell Fenwick Consultants Limited producer statement design dated 25 January, 2001 noted that the upgrade work was designed to remove the earthquake prone status of the structure at that time. The design standard to achieve that was 33% of the "old" Christchurch loadings. This standard conflicts with the recommendations in the Powell Fenwick Consultants Limited report of 8 November, 1999 where an upgrade of close to full code was recommended. The change was because it was subsequently determined that the alteration was not a change of use for the building and hence only the issue of earthquake prone status had to be addressed.

The upgrade work completed was to tie the wall structures into the first floor and to provide a stiff and strong bracing element to the front façade of the building below the first floor level. The aim of this work was to utilise the inherent in plane strength of the brick walls and of the floor as a horizontally spanning beam. The upper floor was a domestic fitout with sufficient internal bracing walls.

The front façade was tied into the first floor, and had restraint from the transverse walls, the first floor ceiling, and the roof structure.

A Youtube footage of the damage to the building after the earthquake shows that the front façade has fallen on to the verandah, which has in turn collapsed to the pavement level. All of the units in the row have a similar collapse. The building at 595A appears to have held the brickwork better, with sections still connected to the transverse walls either side, whilst the neighbouring buildings appear to be peeled off fully. It is also noticeable that the adjacent buildings appear to have collapsed a little internally, whilst the strengthened structure at 595A has stood up well.

I suspect that the adjacent facades have failed first and have in turn pulled the façade from this building. The bite size shape of the section of brickwork remaining above the first floor level is indicative of this. It suggests a tearing starting to the North and pulling across the façade of this building.

The November Powell Fenwick Consultants Limited report notes that this building is one of ten in a group, and that upgrading one building can often penalise that building as it will attract more than its share of load, until the other units are similarly upgraded. It appears that in terms of the face loads to the façades that this is what has happened to this building.

Looking forward, there is scope to attach real importance to the parts of a structure that have more likelihood to cause loss of life, or to inhibit rescue activities. The building facades are clearly an example of this. When buildings are strengthened to only to a proportion of the current code, there is merit in requiring that façades ties and supports and other elements that could impinge on critical activities are strengthened to the full code.

Yours faithfully,

TM CONSULTANTS LTD



KJ Simcock