



## Wynn Williams House

Christchurch

Ruamoko Solutions for R A Owen & Valinor Trust

Structural Engineering



Wynn Williams House is a new six-storey building on the edge of Christchurch's CBD, replacing the concrete 1930's eight-storey building known as St Elmo Courts which was demolished in April 2011 after suffering significant damage in both the 2010 Darfield earthquake and the subsequent 2011 Christchurch earthquake. The structural design of this project combines base isolation and post-tensioned timber and concrete two-way seismic frames to mark a world first in seismic design.

The project's structural elements have been independently used before, but it is the specific combination of base-isolation, post-tensioned hold-downs and post-tensioned frames with precast concrete columns and fabricated laminated veneer lumber (LVL) beams that make this building unique. These combined structural elements mean the building will be subject to little or no structural damage following a full code earthquake, a feature that has become increasingly important in Canterbury.

Implementation of this structural design presented Ruamoko with a number of unique challenges that required the development of innovative design solutions. In particular, the use of the post-tensioned timber LVL beams, in a relatively tall building had significant design, fabrication and construction challenges.

This design demonstrates that moderately tall structures can use engineered wood and base isolation - usually considered too expensive - to deliver cost effective construction.

With a gross floor area of 6000m<sup>2</sup> and a construction cost of \$15 million, Wynn Williams House has a construction rate of approx. \$2500 per m<sup>2</sup>, significantly less than published rates of \$2700 - \$3000 per m<sup>2</sup> for Christchurch office buildings (Rawlinsons NZ Handbook 2013/2014).

### Judging & Copyright Statement

This project is a Finalist entry in the 2015 INNOVATE NZ Awards of Excellence competition. The winners will be announced on Saturday 1 August, 2015.

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