

The February Christchurch Earthquake

Bracing Systems prove effective in earthquake

In the early afternoon of Tuesday 22 February Christchurch was struck by a devastating earthquake causing large scale damage in the CBD and surrounding suburbs. Earthquake records show that some buildings may have experienced shaking more than twice the intensity a new building would currently be designed for.

Winstone Wallboards engineers Richard Hunt and Hans Gierlich went down to assess the structural safety of approximately 100 houses, specifically to support Fletcher Building employees and their families and to investigate the performance of light framed buildings with gypsum plasterboard linings.

Although the main damage to houses caused by the September earthquake was as a result of liquefaction, subsidence and lateral spread of 'soft soils', the February earthquake added violent shaking of houses constructed on rock and the hillsides of suburbs like Mt Pleasant, Sumner, Cashmere and Lyttelton.

Damage on soft soils included cracked, broken or tilted concrete slab, cracked or fallen chimneys and brick veneers, shifted pile foundations and internal lining cracks as a result of settlement, typically at sheet joints around window and door openings. Not surprisingly, concrete slab houses with brick veneer and heavy tile roofs suffered most on soft soils. Although damage on rock and hillsides was similar, it could be directly attributed to shaking.



Piles of silt in some streets collected following liquefaction

Without having building plans, design calculations, and 'as built' information available it is difficult to analyse in detail how bracing systems in individual houses performed, but from what was viewed, gypsum plasterboard sheet linings fared well and provided required bracing resistance. Given the severity of this earthquake, some cracking of linings was in evidence. However, it is clear that plasterboard bracing systems performed well and protected houses from more serious damage.

Houses under construction also provided important information. We found such a two storey brick veneer house in the severely affected suburb of Mt Pleasant, carefully designed by the building inspector/owner with designated horizontally fixed GSI and GS2 bracing elements clearly marked on the floor and installed using the specified fastener pattern. The plasterers were at work when the earthquake hit, and stopped sheet joints were still fresh. Apart from expected shear failures of the wet plaster joints, the house, supported by GIB® bracing systems, stood up very well.

Building inspector's Mt Pleasant home under construction lost some of its brick veneer, but performed well supported by GIB® bracing systems



What happens next?

Now that the initial shock, hype and media attention are waning, countless Cantabrians are almost literally left holding the pieces of their broken houses and lives. The scale of the event means that the wait to have homes repaired or rebuilt will be long and frustrating for many. Recent events in Japan, and before long the rugby world cup, are also likely to over-shadow events in Christchurch, but let's make sure we continue to provide whatever continued support is needed to get Christchurch and its people back on their feet.

For further information on rectification Winstone Wallboards has produced two bulletins, 'Guidelines for repairing GIB® plasterboard lining in Wind + Earthquake damaged properties' and 'Repairing Lath and Plaster walls + ceilings'. These can be downloaded from www.gib.co.nz/earthquakebulletin

Winstone Wallboards: Emergency support in keeping operations going

The Christchurch Winstone Wallboards Team

Subsequent to the terrible February earthquake, our first priority was to establish the safety of our team and their immediate families. Thankfully no one had been injured. But like many other Canterbury residents, a number of staff did experience damage to their homes.

To keep the South Island operation moving, on the evening of the 22nd February, our IT team successfully re-directed the supply to all our South Island customers direct from Penrose, Auckland. This was coordinated with The Gate (our Auckland distribution centre) supplying the South Island and extending the Auckland manufacturing operations to ensure we continued to supply throughout New Zealand.

On inspection of the distribution centre, board plant and plastermill, we found the damage to be more extensive than occurred in September. However we were confident that we would be fully operational by the end of March.

Thanks to the tireless efforts of our Christchurch team, the distribution operation was restored to a point where we could resume servicing South Island customers from 1st March, just 1 week after the earthquake and almost a week earlier than first anticipated. Some of the manufacturing team were rostered to assist in despatch while others helped with the cleaning up of the site and bringing the plant back on line.

The main concern at the manufacturing plant was the lack of mains water supply. Thankfully our team was able to devise an interim solution which resulted in the plant being operational within two weeks from the quake. This was an amazing feat given the initial assessment indicated at least 3 to 4 weeks would be required. Extra shifts were arranged to clear the backlog of orders and meet our customer requirements. The living conditions in Christchurch continue to be difficult for many of our team. In spite of this, we can take heart from the tremendous spirit and commitment our Christchurch team continue to show.

We are extremely proud of our team in Christchurch and the rest of the organisation, who responded quickly to support the Canterbury region and the rest of the South Island.



Auckland Head office staff supporting our Christchurch teammates on 'Red and Black' Friday.