

Article - Christchurch January 2012

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THE CHRISTCHURCH EARTHQUAKES AND THEIR EFFECTS IN WELLINGTON

A simple explanation to be
translated into Chinese for

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The people of Christchurch City have now endured more than a year of large earthquakes that have caused serious damage to homes and commercial buildings, disrupted their lives and created severe financial problems for property owners. However, it is not only the residents of Christchurch who have suffered. Insurance companies have increased the cost of all types of insurance throughout New Zealand to help pay for the loss and increased the cost of earthquake insurance for buildings by 50% to 400%.

Many people from overseas prefer brick buildings over timber buildings because they believe these to be more durable. This is not necessarily true in an earthquake-prone country. In New Zealand, there are two main types of brick buildings: brick-veneer buildings have an outside skin of bricks attached to an internal timber frame. Generally these are considered to be safe and the worst that can happen is that the outside skin will crack and fall off, but the roof and walls should remain intact and the people inside should survive. The other type, which is generally older, is the cavity-brick building where the outside wall consists of two layers of bricks and the inside walls consist of a single layer of bricks and there are no timber walls. These houses are extremely dangerous and could fall down in a major earthquake. Strengthen such houses is extremely difficult and expensive and may not be economically possible.

Many people may own larger buildings, such as shops, offices or apartment buildings with two or three stories. The danger in these buildings has long been recognised by the Wellington City Council and for many years they have been encouraging owners to strengthen their buildings. Two and three storey brick buildings are a serious hazard because they were never designed to resist earthquakes. Brick buildings are held together only by the strength of the mortar between individual bricks and when subjected to large earthquakes could be severely damaged or may even collapse. The general method of

strengthening these buildings is by adding steel frames inside the existing walls using I-beams. Unfortunately, for many years the City Council (and the law) only required that buildings be strengthened to only a small degree. Some buildings around Wellington have already been strengthened to this level. However research over the past 30 years has shown that this level of strengthen is not adequate in a larger earthquake and sadly this has been confirmed by the Christchurch earthquakes. It is likely that these buildings will need to be re-strengthened.

It is not only brick buildings which are dangerous. Concrete buildings can also be damaged by earthquakes if there is insufficient reinforcing steel in the walls, beams and columns, and if they are built on filled land (such as in Te Aro) or have not been designed in accordance with modern earthquake engineering principles.

INITIAL EVALUATION PROCEDURE

Report from the Council

Many building owners will have received a letter from the Council enclosing an IEP form and the advice that their building is potentially an earthquake-prone building because its strength is assessed as less than 34% of current code. This procedure is based on a "kerbside" assessment of the condition of the building, its age and structural type, a preliminary review of the drawings if available, and an assessment of the local ground conditions read from soil maps. It is not definitive or final. An structural engineer will need to study the building further to determine whether this initial assessment is correct, whether your building is in fact stronger than assessed or advise you on the best method of strengthening the building.

STAIRCASE COLLAPSE

Many building owners in Wellington have recently received a letter from the City Council asking them to check that the stairs in their building are not of the type that collapsed in Christchurch, trapping some people in upper stories after the earthquakes, with no means of

escape. The stairs in Christchurch were precast units in a multi-storey building with weak connections to the main structure. A structural engineer can advise whether a similar problem exists in your building.

LIQUEFACTION

Liquefaction is the change that soft soil or filled land undergoes when shaken by an earthquake. What was previously seen as relatively solid ground becomes soft and jelly-like when violently shaken and underground water sometimes rises to the surface. Under these conditions, the earthquake effects on buildings are amplified (are felt more strongly). Buildings built on soft soil or filled land (such as in Te Aro) are required to be designed (or strengthened) to resist stronger forces than buildings built on more solid soil or rock.

EFFECTS IN WELLINGTON AND NEW ZEALAND

The Christchurch earthquakes are having the following effects:

1.
The cost of earthquake insurance for all buildings has increased.
2.
Insurance companies will sometimes only provide indemnity insurance (value of the building as an older building)

and will not provide replacement insurance (the total cost of replacement of a severely damaged building by a modern equivalent building.)

3.
It is difficult or impossible for a new purchaser to arrange earthquake insurance for an older earthquake-prone building. It is therefore difficult or impossible to sell an older building because no one can arrange finance without insurance.

4.
The owner of a single inner city apartment inside an older building cannot sell their unit because the body corporate has not yet resolved the strengthening of their building and cannot certify to a purchaser the status of the building and the estimated cost of the new owner's liability.

5.
Government and corporate tenants are not renewing the leases on buildings unless they are certified as having been built or strengthened to a high standard. This affects the value of many commercial properties since an empty commercial building is worth nothing.

6.
The City Council is under public pressure to get as many earthquake prone buildings strengthened as soon as possible but at present cannot predict the level of strengthening required under new laws being considered by the Government. The Council is however embarrassed to ask people who have strengthened their building already to re-strengthen their building to a higher degree.

7.
A change of use of even a small part of a building, or any work requiring a building consent, will trigger the requirement to strengthen the whole building to the new requirements. This means converting a part of a building to an apartment or bar or shop may mean strengthening the whole building.

For these reasons, it is necessary for owners to actively manage their property portfolio for earthquake risk so that:

- Their properties comply with the law.

- Adequate insurance is in place and insurance costs are minimised.

- The property can be sold, insured and funded by a new purchaser without delay.

- Tenants sensitive to earthquakes risks will re-new their leases.

- They are acting as a responsible corporate citizen and a prudent investor to minimise the risk to your tenants and protect your investments.

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Looking to the future

It is likely that the Government will change the law to require buildings to be strengthened to a higher degree than at present. In many cases it will be very difficult or very expensive or even impossible to comply. It is also likely it will not be possible to let matters drag on for 15 years or more as has happened in the past.

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