

Earthquake-prone buildings

Recently, councils have been required to develop policies to deal with earthquake-prone buildings. The earthquake in Gisborne last year was a good opportunity to see how valid the approach taken has proved to be.

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The Building Act 2004 required councils to adopt policies on the demolition or strengthening of earthquake-prone buildings in their area by May 2006. Public consultation allowed these policies to reflect community concerns. As a result, some councils are taking an active approach by undertaking initial evaluations and following up with formal notices. Others are more passive, only undertaking evaluations when a building consent for significant work is applied for. The various policies are available from the councils and are posted on their websites.

When is a building earthquake-prone?

The threshold strength for a building to be considered earthquake prone was defined by regulations set in 2005 as one-third the strength of a new building. Thus, the absolute level will change as the structural design codes change over time.

Most councils future-proofed their policies by using AS/NZS 1170 *Structural design actions* set as their evaluation base. This standard now forms the basis for acceptable design being cited in Clause B1/AS1 *Structure*, to be implemented from 1 December 2008. The impact of the change is greater for areas of potentially higher seismicity like the Wellington region. Councils with a policy based on the previous standard,

NZS 4203:1992 *General structural design and design loadings for buildings*, now need to revise it and re-evaluate the building stock.

Strengthen to at least one-third Code

There is no requirement in the legislation to strengthen earthquake-prone buildings to any particular level other than achieving a strength one-third of the current Code. However, it is believed prudent for owners to strengthen to higher levels if possible. At the threshold strength, buildings still have a significantly higher risk of collapse (up to 20 times that of a new building). Strengthening to two-thirds of Code standard is considered reasonably achievable for most buildings.

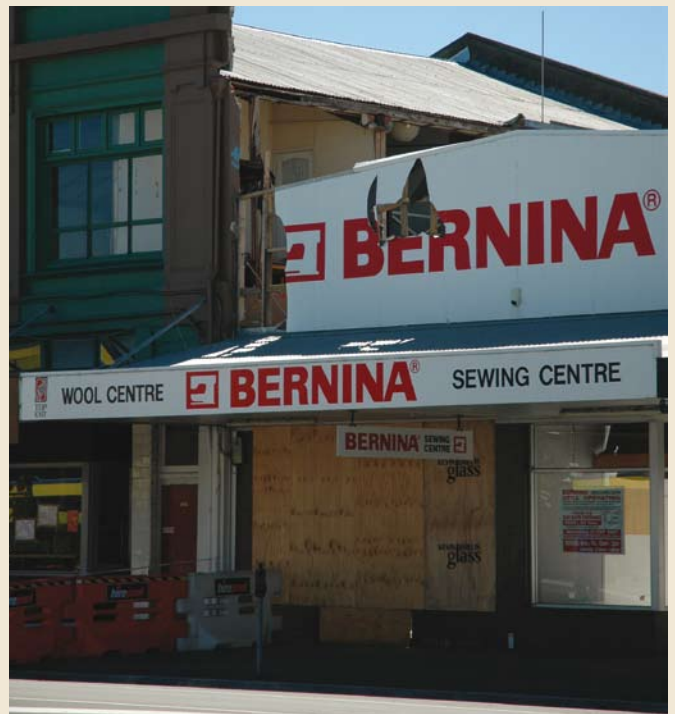
The marginal cost may not be prohibitive. Much of the cost of strengthening is associated with lost income, relocation and make-good costs. Only doing the minimum now can mean having to go through the process again when legislation or standards change in the future.

Earthquake-prone building notices

The Building Act provides for councils to issue earthquake-prone building notices (section 124) where a non-residential or apartment (3 or more units and 2 or more floors) building has been identified as having a



Damage in Gisborne from pounding of adjacent buildings.



Two of the buildings more badly damaged during the December 2007 Gisborne earthquake.

strength below the Code standard. These are formal notices issued to the owner(s) and copied to occupiers and all those with an interest in the building. A copy of the notice is also affixed to the building.

The notice will require work to be undertaken to demolish or strengthen the building and will specify a timeframe for compliance. It is an offence not to comply; the Building Act provides for significant penalties and gives councils a range of enforcement options. Any notice issued on the building transfers to the new owner.

What to do if a notice is issued

Owners who receive a notice need to make plans to comply. If the building is not to be demolished, get expert advice from a structural engineer about strengthening options. Plan carefully to provide for access to carry out the work, including considering staging the work. Structure tenancy agreements so that the areas where the strengthening work is to take place can be vacated.

For public use buildings, assess the viability of continued occupancy as work proceeds and the possible requirement to obtain a 'certificate for public use'. Providing access can be especially problematic for unit titled and residential buildings. The body corporate will need to plan for expenditure and coordinate access provisions.

Where the primary issue for the building is 'pounding' because of the lack of separation between buildings, it may be necessary to agree a collective approach with the neighbouring building owner(s) to overcome the problem.

Pre-1976 buildings

Structural standards incorporate best knowledge at the time, often incorporating learning from real earthquake events. Buildings designed post 1976, when NZS 4203 was first adopted, are unlikely to fall below the strength threshold.

Earlier buildings need to be carefully evaluated, particularly in areas of higher potential seismicity. It is recommended that owners of pre-1976 non-residential or apartment buildings that have not yet been evaluated engage a structural engineer to assess the building's structural performance. Lead times for planning any remedial work can then be maximised.

Due diligence when buying a building includes ascertaining its earthquake-prone status. The existence of an earthquake-prone building notice is a matter of public record. Councils may also make available any structural evaluation reports they have. Such information can be obtained from the council through a property report or LIM (Land Information Memorandum).

Gisborne shows risk needs addressing

The Gisborne community was fortunate last December in the timing of the earthquake that occurred after office hours and just as retail shops closed. The absence of large numbers of people and a measure of good luck meant that there were no fatalities. Although not a large quake, the damage and collapse of central business district buildings could have posed a risk to life.

In Gisborne, it was found buildings strengthened above the one-third current Building Code threshold fared well in the earthquake, whereas those identified as earthquake-prone suffered significant damage. ❖