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## Significant %NBS downgrades loom for some buildings

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A seismic event in NZ's property market occurred in November last year. More like a slow slip quake than a sudden jolt, the November 2018 update to the guidelines for seismic assessment of existing buildings went largely unnoticed by many in the property industry. The effects, however, are now beginning to be felt, with the recent closure of Wellington Central Library and the assessment of its floors at just 20%NBS being one of the first publicly visible signs.

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To appreciate what has happened and where this will lead, it's helpful to first understand the legal and engineering framework within which seismic assessments of buildings are made. The starting point here is the guidelines for The Seismic Assessment of Existing Buildings (*Guidelines*), which detail the technical basis on which engineers carry out seismic assessments of existing buildings. In basic terms, the Guidelines govern how seismic engineers review a building to arrive at a robust assessment of its "%NBS" – the all important percentage of the "new building standard" that an existing building achieves.

This process and the outcomes are hugely important because a %NBS rating (almost universally misunderstood by property advisors and lawyers alike) has become a proxy for seismic safety. As a result, %NBS underpins acquisition, development and leasing decisions and is a key consideration for many Crown agencies and corporates in their property strategies and health and safety assessments. The Guidelines also form part of the EPB (earthquake prone building) methodology produced by the Ministry of Business, Innovation and Employment, by which territorial authorities are required to identify earthquake-prone buildings.

When version 1 of the Guidelines was first released in July 2017 (superseding guidance from 2006), it was seen as a significant step forward. The Guidelines were an extensive revision by industry experts of earlier thinking and incorporated a wealth of research, knowledge and experience obtained from the significant New Zealand earthquakes between 2010 and 2016 – a period which included the Christchurch, Seddon and Kaikoura earthquakes. As such, and with one critical exception, the Guidelines represented the latest understandings on the seismic

behaviour of existing buildings.

That one critical exception was Section C5 of the Guidelines, a section governing the detailed seismic assessments of concrete buildings. With the timing of the general release of the Guidelines in mid-2017, it simply wasn't possible to include new guidance on a range of matters, including assessing precast concrete floor systems to take account of new knowledge from the Kaikoura earthquake, and to respond to recommendations made in the Statistics House investigation. However, this was remedied in November 2018 with the release of a new Section C5 (version 1A), and the slow slip quake in the market began.

The revisions to Section C5 are numerous, with changes addressing: material strength, "single crack" scenarios in concrete members, deformation limits due to buckling of walls and columns, limiting conditions leading to the loss of gravity support in columns, slab-column connections and walls, and strength degradation for lightly reinforced joints. None of that appears particularly reassuring to the untrained eye but, more significantly, there is also a complete revision of the guidance detailing the assessment of precast concrete floors – that is, precast concrete hollow-core, double-tee, rib and infill, and flat slab floor units, all of which have been relatively common methods of floor construction since the 1980s.

In relation to precast floors, the new Appendix C5E records in unemotive engineering prose that, in an earthquake, it is possible for "unseating" of precast floors to occur (that is, precast floors may fall off their supporting ledges within the building frame) and that precast floors can be particularly susceptible to damage that has the effect of "compromising gravity load support" (that is, precast floors may collapse). Appendix C5E goes on to state that "For buildings with older support detailing, the limiting drift at failure of the precast floors is likely to be less than the limiting drift for the frame and may govern the earthquake rating for the building as a whole." Translated, this means that precast floors may fail before the building frame itself and, if that is the case for your building, then its %NBS will diminish to that earlier point of failure.

While the devil is very much in the engineering detail, the practical effect of the changes to Section C5 of the Guidelines is that the %NBS of many relatively new buildings with precast floors is likely to fall. There are many such buildings in New Zealand but, of the larger centres, Wellington, Napier, Hastings and Palmerston North are likely to be disproportionately affected due to their higher "Z-values", being the seismic risk factors applicable to those regions.

How much lower the %NBS numbers will go is, of course, a key issue, as is whether buildings remain safe. These assessments in turn depend on a range of factors relating to a particular building, including the type of floor and the flexibility of the building frame. You will need an engineer to tell you but, for some buildings, the %NBS drop may be significant. While it hasn't been highlighted in reporting to date, Aurecon New Zealand Limited's assessment of Wellington Central Library, is "that the hollowcore precast floor system... achieves a score of 20%NBS" – this for a building that opened in 1991.

Of course, not all buildings will be affected like Wellington Central Library and, for

some buildings, a small %NBS decrease may not be material. However, for owners, tenants, funders and insurers of a 70%NBS structure, a 15-20% drop may well have major ramifications. Where a change in %NBS crosses a critical threshold for a party, their options will, as ever, be constrained by their existing contracts and the availability of alternatives.

Weaknesses in leasing documents will also be exposed. The standard ADLS deed of lease, for example, does not address seismic standards and a number of leases with negotiated seismic covenants require there to be an earthquake of a minimum magnitude before the tenant can even access rights related to the %NBS of the building. Neither position is advisable. However, even where a tenant has a contractual escape route, its options will be practically limited by the availability of alternative premises and business continuity requirements.

A further issue is how or whether affected parties will even know that the %NBS of the building has fallen. In the absence of an earthquake, few tenants will have cause to consider the accuracy of historical seismic reports. The statutory framework also provides little comfort; while territorial authorities are tasked with identifying potentially earthquake prone buildings, these are only buildings below 34%NBS and, even then, for at least an interim period of 18-24 months, those “EPB” assessments must continue to be made using the old Section C5 of the Guidelines. This means that for earthquake prone building purposes there may well be “false negatives” – i.e. %NBS ratings above those supported by the latest engineering knowledge. Beyond the earthquake prone building framework, there is generally no incentive or legal requirement for landlords to seek assessments that may indicate things have changed for the worse, or to disclose these if they are obtained.

Even less likely is that owners, outside local or central government, will close their buildings and, other than in the most extreme cases, there is no legal requirement for them to do so. In the case of Wellington Central Library, where engineers identified that “the potential loss of seating of the hollowcore units presents a significant hazard and potential risk to building occupants following a significant earthquake event”. Mayor Justin Lester observed that “We're not legally obliged to close this building, we are morally obliged”. Not all building owners will see it the same way.

Those concerned about their buildings should seek information from engineers and owners and take engineering and, potentially, legal advice. Next steps can then be informed by reference to assessed risk, existing contractual positions and organisational health and safety policies and obligations.

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