

Questions and Answers: TS1170.5

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Version 1.2

The launch of the consultation on TS1170.5 has generated significant interest from the wider property sector. This Q&A is intended to help answer the queries we have been presented with from our industry partners. It is intended to provide insights, rather than a definitive statement on the impact of TS1170.5.

What is Technical Specification 1170.5?

Technical Specification 1170.5 (TS1170.5) provides a means to incorporate the results of the most recent update of the seismic hazard results from the National Seismic Hazard Model (NSHM) into the structural design of new buildings.

A Technical Specification (TS) does not have the same status as a New Zealand Standard (NZS) and does not require the same degree of rigor (consultation/impact assessment) before it is published; it will also not be part of the Building Code.

Therefore, issuing the changes as a TS rather than a NZS allows the new specifications to be road-tested, and the impacts assessed before incorporating the new knowledge as a NZS into the Building Code during future revisions.

What is the National Seismic Hazard Model?

The National Seismic Hazard Model (NSHM) provides an estimate of the likelihood and strength of earthquake ground shaking that might occur at any given site (the hazard) in New Zealand and helps deliver science-based estimates that are essential for developing risk assessments.

The NSHM was updated by GNS Science in 2022 and represents the latest scientific knowledge in earthquake hazard and is an important input into managing earthquake risk in the built environment. It is an authoritative piece of work that has been subjected to international peer review. It does contain uncertainties in the estimates of the hazard, and these can be revisited if necessary.

TS1170.5 provides the structural engineer with design loads that reflect the updated NSHM estimates.

How is TS1170.5 different to what we have now?

It is largely similar in approach to the current earthquake design standard NZS1170.5, which was integrated into the Building Code in 2004, but reflects updates to the design earthquake loadings.

There are changes in seismic loadings for the structural design in general (with a few exclusions), as well as design loadings for non-structural elements (e.g. supports for building services and architectural fit out). Some simpler provisions for rocking foundations have also been introduced.

Which parts of the country are most affected?

The design seismic loads have increased for most parts of the country. Increases vary depending on the site soil conditions and location, with the greatest increases indicated for the highly seismic areas, e.g. Wellington and the Wairarapa. For some areas, the design loads are very similar to the status quo and in a few instances a reduction has been signalled.

An overview of the changes across the country is available on GNS Science's website.

<https://www.gns.cri.nz/research-projects/national-seismic-hazard-model/>

Is the Building Code going to be updated with TS1170.5? If not – doesn't this just create more uncertainty that it will be included in the Building Code at some point in the future?

The minimum standard for structural stability required to meet clause B1 of the Building Code might be expected to be adjusted sometime in the future to reflect the increase in seismic hazard now being indicated from the NSHM. This would be done through an update to NZS1170.5. To assume this change should or could never occur might be considered denying reality or delaying the inevitable.

However, it is important the status quo is retained to provide the industry with some certainty while the practicality and impact of meeting the latest hazard values is being evaluated. MBIE has indicated that the TS can be used as an Alternative Solution once it has been published, but in the foreseeable future it will not represent the minimum standard.

Experience in the coming years may indicate the TS's provisions are not an appropriate response to the latest hazard, and amendments are warranted before it is adopted as a new minimum standard. Regardless, a further round of more extensive consultation will be undertaken before the TS is adopted as a NZ Standard and brought into the Building Code.

Are new and existing structures equally impacted by TS1170.5?

The TS is specifically for new buildings.

Considering the impact of new hazard estimates for existing buildings will require greater deliberation because of the far-reaching impact on society. The more highly seismic areas push our understandings around tolerable risk and structural behaviour of existing buildings in earthquakes to the limits of current knowledge – and potential seismic upgrades are constrained by available resources (money, workforce, etc.).

Therefore, it is appropriate to maintain the settings for existing buildings at current levels until the community can fully appreciate the costs and benefits of any change in conjunction with the risks. There may become a time when this higher risk is considered to be unacceptable, but this is rightly a decision for the community to make.

Accordingly, it has been signalled by MBIE that the status quo should remain for the foreseeable future until these issues have been given due consideration.

Is my building's %NBS rating going to be automatically downgraded as a result of the publication of TS1170.5?

No. %NBS is a rating related to the minimum cited standard for new buildings, and this remains linked to the NZ Standard NZS1170.5:2004. The TS would need to become a NZ Standard before it is even possible it would be cited as the minimum standard, and this would understandably require consultation with the public.

The setting of an appropriate line in the sand for 'earthquake-prone buildings' is very much a decision for Government on behalf of the public. MBIE has strongly signalled there is no intention to adjust these settings in the foreseeable future.

It could be expected that any new knowledge gained in the years ahead on the way existing buildings respond in earthquakes could potentially identify new vulnerabilities, but likewise could also provide confidence around better than previously expected structural behaviour.

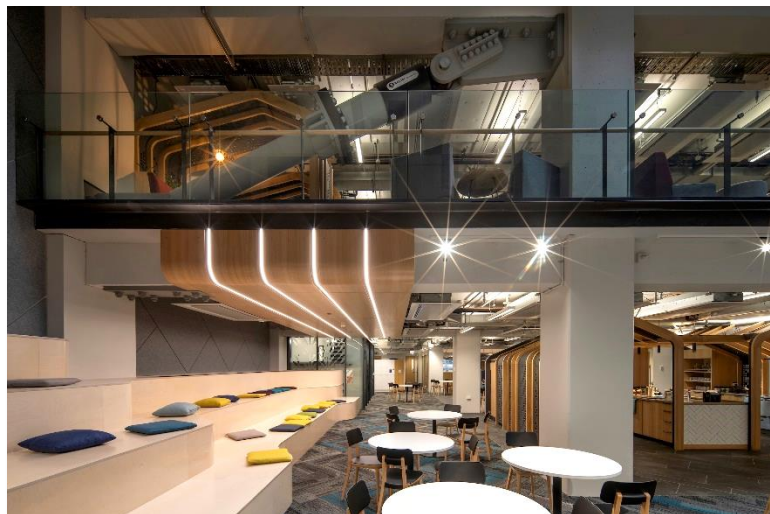
Will we be able to afford to build new structures in places where the seismic loading requirements have been lifted substantially?

This is a good question. Structural engineers can only apply the tools they have available, and some conventional design approaches are reaching the limits of their applicability for some of the load levels prescribed in the TS for the highly seismic areas.

However, new techniques have been developed that are transforming the prospects of vulnerable structures into high levels of resilience – with Beca's award-winning seismic retrofit at 8 Willis Street in Wellington a leading example.

<https://www.beca.com/what-we-do/projects/buildings/8-willis-street>

8 Willis Street (right)



This is just engineers and scientists making life impossible for the wider property sector. What consideration is given to people who have to pay for and build assets?

Engineers and scientists are also members of the community in which we live and work. The majority would like to avoid change if that was at all possible, given the disruption and cost of upgrading buildings.

However, we are duty bound to point out when existing knowledge might be deficient – this is an expectation the public rightly has of us as professionals. It is then up to the community to indicate the risk it might be prepared to tolerate and agree the appropriate response, weighing up the costs and the benefits.

The original intent of upgrading existing buildings was to drive progressive improvement over time of our existing building stock at a pace and cost that tenants and building owners could tolerate. The high level of seismicity since the 2010/11 Canterbury Earthquakes has changed the perception of how quickly this should be achieved.

How do our seismic hazard and building requirements compare to other parts of the world, e.g. Japan and California

The 2022 NSHM revision indicates that our seismic risk in our most seismically active parts of New Zealand is comparable to the most seismically active parts of Japan and the United States. The design standards for Japan typically deliver ‘low damage design’ buildings; this is less the case in the United States.

Does TS1170.5 have any impact on health and safety decision-making?

WorkSafe has provided advice on its website, but it is uncertain how it would act if the new knowledge from the NSHM update and TS1170.5 is not acted on as part of decisions relating to existing and new buildings.

What is the process from here for the TS to be published?

The public consultation on draft TS1170.5 closes on April 3rd 2024. The TS will be published once this feedback has been addressed by the TS Committee. The time this takes will depend on the volume of responses, and the issues raised. This unlikely to be before mid-2024.

Any inclusion in the Building Code via an update to NZS1170.5 (whenever that occurs) is unlikely to happen before 2027, when a wider update of seismic requirements has been signalled.

It is worth noting that typically the seismic components of the Building Code are reviewed every 10 years, but this has not occurred since 2004 other than adjustments made for Canterbury following the 2010/2011 Canterbury Earthquakes.

Who should be interested in the TS?

Given TS1170.5 is not going to be part of the Building Code in the immediate future, it is primarily of interest to those trying to gain an appreciation of how data from the NSHM could be incorporated into Building Code requirements at some future time.

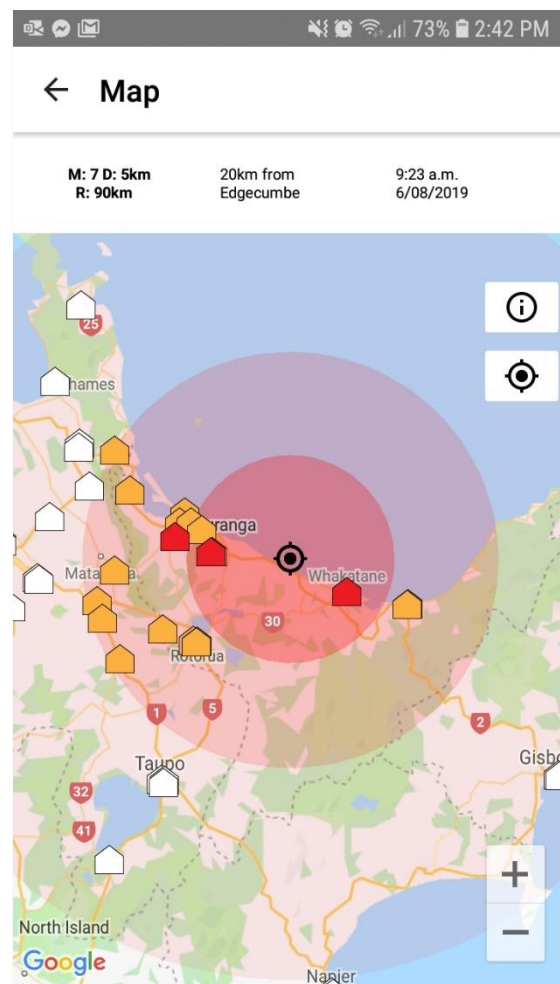
Our organisation uses Beca's Beacon post-EQ asset triaging app – has anything changed?

Beacon provides near real-time notifications about the estimated impact of an earthquake on your assets. As it is responding to actual seismic events nothing has changed in terms of the information you have provided on your assets.

However, the increases from the 2022 revision to the National Seismic Hazard Model reflect an expectation of greater seismicity across New Zealand than indicated by the 2002 National Seismic Hazard Model.

As always, anything built or retrofitted to a higher standard will be less vulnerable – but this information is already part of the asset data uploaded for your portfolio.

Simulated earthquake to demonstrate Beacon's post-earthquake portfolio notification functionality



Where can I find more information?

GNS website on the National Seismic Hazard Model

<https://www.gns.cri.nz/research-projects/national-seismic-hazard-model/>

MBIE website (TS public comment)

<https://www.mbie.govt.nz/about/news/technical-specification-for-the-design-of-new-buildings-out-for-public-comment/>

NZ Standards for copies of TS1170.5

<https://consultations.standards.govt.nz/>

The recorded webinars on the technical aspects of the TS provisions (for engineers)

<https://www.engineeringnz.org/news-insights/technical-specification-1170-5-resources/>

Dealing with earthquake-related health and safety risks: information for PCBUs and building owners

<https://www.worksafe.govt.nz/laws-and-regulations/operational-policy-framework/operational-policies/dealing-with-earthquake-related/>

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