

Changes ahead for 3604

The King Kong of building standards is having some serious work done. Updates coming to NZS 3604 will include widening coverage to medium-density housing and helping steer our homes towards the net-zero carbon world of 2050 and beyond.

NZS 3604:2011 *Timber-framed buildings* plays a crucial role in building controls and is one of the most frequently downloaded standards in New Zealand. Its long history, industry familiarity and referencing in the Building Code have led to its use in a significant portion of the country's houses. Although no up-to-date figure is available, one industry assessment a few years ago found '... it is used in the construction of an estimated 93% of New Zealand's light timber-framed buildings'.

Evolution of a standard

The forerunner to it was first developed after the 1931 Napier earthquake when 256 people died under collapsing buildings. This shocking loss of life led to the formation of rules to ensure new buildings were safer. The first version of NZS 3604 itself was published in 1978 and ran to 123 pages. The current 2011 version is around 450 pages.

It is anticipated that the new, completely updated version will be published in late 2023 and then cited in the 2024 Building Code update.

Benefits of using NZS 3604

Part of the importance of NZS 3604 is the fact that it is referenced (with modifications) as an Acceptable Solution for several New Zealand Building Code clauses. Being part of deemed-to-comply pathways for building consent means that building consent authorities (BCAs) must accept consent applications if the design follows the requirements exactly.

This makes NZS 3604 popular and very familiar to industry practitioners and building consent officials. Using NZS 3604 details means a designer has less need to engage an engineer, which is another benefit.

Expanding the application of NZS 3604 naturally expands the circumstances where these benefits apply. A broader range of standardised details will reduce the work where a chartered engineer needs to be engaged and will make compliance checking easier for BCAs.

Key areas being considered

Standards New Zealand has set up a technical committee to draft the revision, and a series of expert working groups are going through the standard right now.

The precise details the final updated version will contain are not certain, but many of the key areas currently being considered have been flagged in advance.

Expanding to cover 3 full storeys

The scope of the standard will be expanded to include 3 full storeys to address the increasing demand for medium-density housing. (The proportion of housing consents made up by multi-unit homes has fluctuated over time, but in recent years, the direction has just been up. In the year to March 2021, multi-unit homes accounted for 44% of all new home consents, up from just 17% 10 years earlier.)

The changes will allow the standard to be used for a row of 3-storey townhouses. This feature complements other design solutions for timber-framed housing units that are stacked in 4-6 storey buildings such as the BRANZ guidance *Multi-storey light timber-framed buildings in New Zealand: Engineering design*.

Aiding better thermal performance

As New Zealand works towards reducing greenhouse gas emissions in future years, our construction methods will need to change, but the details of exactly how are not yet clear.

In practical terms, the standard is likely to provide construction details that can be used when a higher level of thermal performance is required. The new construction details will provide space for additional insulation in external walls, above ceilings, under roofs, under slabs and outside foundation walls.

Given the standard is focused on structural performance, this feature only facilitates compliance with Building Code clause H1 *Energy efficiency* rather than providing a formal Acceptable Solution. It will be more generally supportive of better energy efficiency.

Foundations on expansive soils

The old Simple House Acceptable Solution included a foundation solution for expansive soil. Acceptable Solution B1/AS1 has already written part of that Acceptable Solution into NZS 3604. An improved version of that solution will be added in to the NZS 3604 update, giving a definition of when a soil is expansive and then appropriate foundation details.

Foundations on liquefaction-prone soils

Following the Canterbury earthquakes where soils liquefied in some areas, foundation details were developed to deal with this risk. Some of those details will be added to NZS 3604.

Support details for long-span beams and lintels

Currently, there are many lintels and beams that are commonly used, but they require specific engineering design because of their length. Selection tables for support details will be added for use with proprietary beams, together with details for supports, connections and fixings and foundations.

Walls between units

Construction of inter-unit walls is becoming more common with the growth of medium-density housing. These walls need to provide stability, fire and sound control between units. Having standardised performance details available will be useful in a growing number of construction projects.

Passive fire protection

When a fire breaks out, medium-density housing provides different risks to occupants, other buildings and firefighters compared to stand-alone houses. The standard will facilitate use of proprietary passive fire protection measures that cover connected buildings with up to 3 storeys.

Bracing systems

Bracing rating tables and construction details for common solutions such as steel portal frames will be added.

Internal barriers

As both 2-storey houses and medium-density housing become more common, details will be added for commonly used internal barriers such as a low wall beside a stairwell or balcony. Framing span tables will be extended for wall framing around stairwells that extend into a second storey.



Changes are coming to NZS 3604, the standard used in most light timber-framed buildings in New Zealand.

Not included

Several building elements have been ruled out of the update, including:

- concrete lintels and beams
- masonry walls and columns
- solid panel systems
- proprietary flooring systems
- up to 3 storeys on top of a steel or concrete building.

The update is not intended to be referenced by any Acceptable Solutions other than the ones that already cite the standard.

Accessing NZS 3604:2011

MBIE Building Performance has sponsored access to view and print a single downloadable PDF copy of the present NZS 3604:2011 at no charge. You can find it at www.standards.govt.nz. The standard can also be bought as a hard copy or as part of an online library subscription.

The BRANZ publication *Engineering basis of NZS 3604*, which will be updated to reflect the changes, is available at no charge from the BRANZ website www.branz.co.nz/shop/. ◀