



National Construction Code

Recent changes to the National Construction Code (NCC) have simplified the processes for the design and certification of timber mid-rise buildings. These changes set out “Deemed to Satisfy” (DTS) provisions for timber buildings up to eight storeys tall, bringing Australia in line with other countries like Sweden and the UK that have allowed tall timber buildings for many years.

The National Construction Code

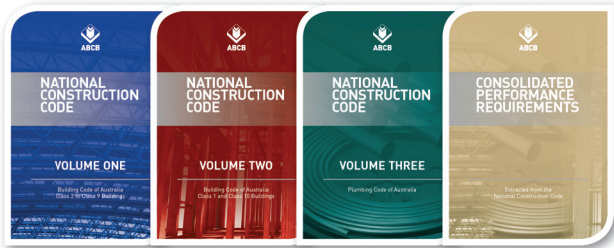


Figure 1 The National Construction Code

The National Construction Code (NCC) regulates the design and performance of all new buildings. It does not regulate how to build buildings, only building performance. Requirements cover a wide variety of topics including safety and amenity, and ensure that all buildings are to Australian standards of living (Australian Building Codes Board, 2015).

The NCC provides guidelines as DTS solutions. These are clear checklists of requirements to demonstrate a particular type of construction is compliant. Where a DTS solution does not exist, the project designer must devise their own method and demonstrate compliance to the minimum performance criteria.

Changes to the National Construction Code

Prior to 2016 the NCC only included a DTS for timber residential buildings up to three storeys. This meant that developers of taller timber buildings had to devise their own method to prove that they had all the necessary safety features. This was a significant discouraging factor and resulted in timber not being considered for these building types. In 2016, the Australian Building Codes Board amended the NCC to include a DTS for Class 2, 3, and 5 timber buildings (apartments, hotels and office buildings) up to eight

Quick Facts

1. All Australian States and Territories adopted the NCC, Volume One, effective from 1 May 2016. The update included a DTS provision for mid-rise timber residential and office buildings.
2. The updates included standards for the construction of mid-rise timber buildings up to 25 metres or eight storeys tall, allowing approval of these buildings without an individual assessment of a performance solution.
3. Timber buildings require specific fire prevention and safety measures. The 2016 NCC changes included detail on fire provisions including sprinkler requirements and fire separation, non-combustible covering to some timber elements as well as sealing from fire spread through cavities.

storeys. DTS provisions now include both traditional lightweight timber framed structures and more modern massive timber structures such as Cross Laminated Timber. Therefore, since May 2016 **mid-rise timber buildings are now specified, designed and built without lengthy review processes** and they are beginning to be more prevalent as a result.

Australia is now in line with other countries such as Sweden, the UK, Canada, and Norway. In the first ten years after the introduction of mid-rise regulations in the UK in the early 2000s, the construction of over 100 CLT buildings took place. In Canada, more than 250 timber buildings have been constructed (Canadian Wood Council, 2017).

Timber buildings have many advantages, being generally cheaper to construct due to their ability to be prefabricated which reduces on-site time and cost, and they have lower environmental impact than concrete or steel structures. Timber mid-rise buildings have been built worldwide for decades, with the methods and technologies refined and perfected over this time. As at 2017, the tallest timber building is the Brock Commons in Canada at 18 storeys; however, a 24-storey building called HoHo, is currently being built in Vienna, Austria and there are plans for taller buildings including an 80-storey skyscraper proposed for London. The 25 King Street project in Brisbane, currently under construction, will be the tallest timber office building in Australia at ten-storeys.

Fire Safety Requirement

The main concern for timber mid-rise buildings is fire safety. Accordingly, the new DTS focuses heavily on fire provisions. These include sprinkler systems, fire protecting timber with fire resistant encapsulation, barriers within cavities to stop the spread of fire between areas and the use of non-combustible insulation (Wood Solutions, 2016). Information that is underpinned by research and evidence based about achieving fire ratings is found in the further reading.

Further Reading

Australian Building Codes Board, 2015. *About the NCC*. [Online] Available at: www.abcb.gov.au/NCC-online/About

Canadian Wood Council, 2017. *Mid-rise Buildings Stronger, Safer, More Sophisticated*. [Online] Available at: www.cwc.ca/building-solutions/mid-rise/

Forest and Wood Products Australia, 2016. *National Construction Code (NCC) – Mid-rise Timber Buildings*. [Online] Available at: www.fwpa.com.au/forwood-newsletters/1078-national-construction-code-ncc-mid-rise-timber-buildings.html

Wood Solutions, 2016. *Mid-rise Timber Buildings*. [Online] Available at: www.woodsolutions.com.au/system/files/WS_TDG_37_16_11_2016.pdf

Wood Solutions, 2017. *2017 ATDA Winner: International House Sydney*. [Online] Available at: www.woodsolutions.com.au/inspiration-case-study/2017-atda-winner-international-house-sydney

Case Study – International house

International House at Barangaroo is a seven-storey office building constructed from CLT and Glulam. Initially, it was the tallest timber office building in the world. The first floor has a traditional concrete structure to remove the timber from the hazards of moisture and termites from the ground. International House began before the introduction of the NCC changes, and has become the perfect example of the structures that are now possible under the new DTS provisions.



Figure 2 International House, Barangaroo, Sydney. Image courtesy of Lendlease.