



7th March 2025

Building System Performance
Ministry of Business, Innovation and Employment
PO Box 1473
Wellington 6140

Re: H1 Consultation - Insulation requirements in housing and other buildings

Tēnā koutou,

Thank you for the opportunity to make a submission on the H1 section of the New Zealand Building Code Consultation – Insulation requirements in housing and other buildings.

Te Kāhui Whaihanga New Zealand Institute of Architects is a 4000-strong, member-based professional organisation representing registered architects, architectural graduates, students, retired architects and affiliated built environment professionals.

The Institute aims:

- To promote excellence in architecture, ethical conduct in the practice of architecture and the interests of the profession.
- To advance the study and practice of architecture.
- To improve and elevate the technical and general knowledge of persons engaged in architecture.
- To bring before government authorities, public and other bodies any matters affecting architecture.

Health Impacts of Poorly Designed Buildings

Our role as architects is to design buildings that fulfil their fundamental purpose: protecting the inhabitants and ensuring their safety and health. As a sector, we must also urgently elevate our standards to address the challenges of climate change. This includes designing buildings that are not only healthy and cost-effective to build and operate but also contribute to lowering emissions and enhancing well-being and comfort for their occupants. Anything that impacts the energy efficiency of the home will have impacts over all these aspects.

Buildings with design flaws that lead to overheating, dampness, mould, and poor ventilation pose serious health risks to occupants. These conditions not only threaten the wellbeing of residents but can also compromise the building's structural integrity, potentially causing rot or rust that jeopardises both safety and longevity.

Ensuring no surface can get cold enough for condensation and mould to form, i.e. adequate consideration of thermal bridging, and adequate measurable levels of ventilation to reduce the level of moisture inside dwellings, commercial, education and other types of buildings is crucial. Not



pursuing the highest possible level of health, durability and energy efficiency in a building is a failure of an Architects' ethical responsibilities.

Energy Impacts of Poorly Designed Buildings

With a typical building lifespan of 50+ years, the buildings designed now will affect the energy use profile of the country for most of the next century. The effect of less energy-efficient buildings will be that the overall power demand increases, leading to a requirement for new and costly generation sources. Investment in energy-efficient building stock can defer future investment and expansion of the national grid and energy sources.

Power costs are soaring, because of reduced generation and increased demand. This imposes costs on consumers, especially the most vulnerable in our society. With a highly insulated and energy-efficient building stock, the costs to consumers and the electricity providers can be reduced or deferred.

In addition, this would assist in meeting Aotearoa's commitment to the Paris Agreement of a 51-55% reduction in emissions by 2035.

Key Recommendations for a Future H1 Standard

Building comfort and energy work as systems and the Building Code should reflect this. Treating each building element as a set of separate parts leads to mistakes and unnecessary costs.

Predictive modelling is key

To ensure best design practice and positive built outcomes we **recommend that predictive modelling should become the default approach, with allowances made for smaller builds and dwellings.** A simple method to address potential issues holistically is to require an early energy model to identify issues and address them, locking in key design decisions as a part of the Building Consent application. We recommend:

1. **Introducing mandatory modelling for townhouses and apartments** as a first step; and stand-alone houses and commercial projects as a second step. This approach allows industry to address this key area of the market first and provide the necessary training.
2. **Removing the schedule method for all but minor buildings and encouraging a phased removal of the calculation method for townhouses and apartments as a first step with predictive modelling become the default approach.** We recommend that allowances for smaller standalone dwellings <90m² are made where the schedule method is maintained for the foreseeable future.
3. **Introducing absolute performance targets (kWh/m²/year) in conjunction with predictive energy modelling.** Tools, such as ECCHO, offer a valuable alternative to the traditional reference building method. By also adopting absolute performance targets, it would provide clearer and more effective pathways to achieving energy-efficient buildings. Building consent could be based on performance metrics (kWh/m²/year) along with a comfort factor, allowing the market to respond within specified parameters. This approach would serve as a more effective Building Performance Indicator (BPI) and aligns with the recommendations made in



MBIE's Building for Climate Change 2020 proposal, which received overwhelming support during public consultation, with nearly 90% of the industry in favour.¹

4. **Standardising modelling software across industry**, whether through establishing a baseline across various tools with key indicators or developing a single standardised software. The key is to ensure that the tools we use are effective for most New Zealand homes and buildings, and that the right tools are tailored to the specific buildings we are assessing.
5. **Upskilling the industry in predictive modelling** as this is the most effective method for determining whether a building will meet the needs of its occupants and is a vital part of the solution. Widespread upskilling across the industry will be required, in using and understanding the modelling outputs, particularly in the area of compliance.

Predictive modelling based on ISO 52016 is the best method for evaluating building performance and aligns with industry best practice. As a sector, we must raise our standards, ensuring we have the necessary tools and expertise to support this shift.

Addressing Overheating is Critical

Te Kāhui Whaihanga New Zealand Institute of Architects strongly recommends addressing overheating now, without delay.

The Building Act purposes refer to health and therefore all the Acceptable Solutions and Verification Methods documents and compliance options should include some means of demonstrating that overheating risks have been addressed. If it is not by predictive energy modelling, another option is to introduce a risk matrix with an upper limit, similar to the approach used in E2. We recommend that:

1. **The initial focus should be on townhouses² and apartments**, ensuring they are properly modelled and undergo shading analysis. The orientation of these buildings is often determined by site constraints, meaning the orientation of individual units can be sub-optimal. They can also suffer from lack of cross ventilation, due to the number of shared walls. This issue can often be mitigated with simple architectural solutions like external shading of windows or low G-value glass.

These typologies are a critical area of concern as we aim to increase urban density. Well-designed dwellings with good ventilation are essential, but this is more challenging to achieve, especially when overheating is prevalent. If we continue to see overheating in townhouses for example, people will be reluctant to embrace medium density living, which is crucial from an environmental perspective.

2. **It is essential to assess both heat loss and overheating.** However, the current code primarily focuses on heat loss and does not take overheating into account, which is particularly problematic for terrace housing.

¹ [Building for Climate Change: Summary report](#)



3. **All townhouses and apartments be required to limit overheating** (internal temperatures above 25°C) to a maximum of 5% throughout the year or maintain a maximum cooling load of a certain limit that is not exceeded more than 2% of the time.

Expand H1 to clearly address Internal Moisture Risks in conjunction with E3

As homes and buildings become increasingly airtight, the risk of water vapor entrapment rises. This is particularly problematic in housing and multi-residential buildings, where high moisture levels are often not effectively addressed by extraction or HVAC systems. Additionally, the impact of added insulation on moisture accumulation needs to be carefully considered. We recommend that:

1. **MBIE update the Building Code to address internal moisture**, and provide clear guidance, with a focus on the long-term benefits of creating warmer, healthier homes.
2. **H1 account for thermal bridging** (e.g., steel or timber passing through insulation), which can lead to significant issues under E3, such as mould, and negatively affect both the health of occupants and building durability.

MBIE should update the Building Code to address critical issues like overheating and internal moisture, with a focus on the long-term benefits of creating warmer, healthier homes. The priority should be on the broader societal and environmental impacts rather than short-term financial gains. Focusing solely on immediate profits could negatively affect climate change, increase illnesses and strain hospital resources and impact the national grid network.

Urgent action is required to prevent overheating, support grid stability and reduce New Zealand's carbon emissions, benefiting both people and the planet. Additionally, transitioning to ISO standards for energy modelling and thermal performance of materials, as proposed by the Building for Climate Change Programme, would align with the Government's approach to adopting international standards, simplifying the use of global products, and reducing duplication.

There is strong support from our membership and industry for these changes. We urge you to take this opportunity to make meaningful change and use it to the benefit of all New Zealanders.

Nga mihi,

Mark Abbot

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