



Consultation submission form

Insulation requirements in housing and other buildings

Amending Acceptable Solutions H1/AS1 and H1/AS2 and
Verification Methods H1/VM1 and H1/VM2

5 December 2024



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Seeking feedback

How to submit this form

This form is used to give feedback on the proposed changes to insulation and energy efficiency requirements.

When completing this submission form, it helps if you add comments and reasons explaining your choices. Your feedback is valuable as it informs decisions about insulation and energy efficiency proposals for the Building Code.

MBIE needs your feedback on the H1 insulation settings review by 5:00 pm on Friday, 28 February 2025.

- Email: building@mbie.govt.nz, with subject line Building Code consultation H1 insulation settings
- Post:
Building Code consultation H1 insulation settings
Building System Performance
Ministry of Business, Innovation and Employment
PO Box 1473
Wellington 6140

Next steps

Your feedback on this document will be collated and analysed along with all the other responses.

Following consideration of the submissions, MBIE will make decisions on the proposals to amend the acceptable solutions and verification methods for compliance with the Building Code.

Use of information

Release of information on MBIE website

MBIE may publish copies or excerpts of submissions. MBIE will consider you have consented to this when you submitted your feedback unless you clearly specify otherwise in your submission.

If your submission contains any information that is confidential or you otherwise wish us not to publish, please:

- state this at the start of your submission, with any confidential information clearly marked within the feedback text
- provide a separate version, with your confidential information removed, for publication on the MBIE website.

Release of information under the Official Information Act

Once submitted, your feedback becomes official information and can be requested under the Official Information Act 1982 (OIA).

An OIA request asks for information to be made available unless there are sufficient grounds for withholding it. If some or all of your submission falls within the scope of any request for information received by MBIE, they cannot guarantee that your feedback will not be made public. Any decision to withhold information requested under the OIA is reviewable by the Ombudsman.

[Get help from the ombudsman](#) – Ombudsman New Zealand

If you do not want your submission feedback released as part of an OIA request, please say so in your submission feedback together with the reasons why (for example, privacy or commercial sensitivity).

MBIE will take your reasons into account when responding to OIA requests.

Seeking feedback

Personal information

[The Privacy Act 2020](#) contains principles on how various agencies, including MBIE, collect, use and disclose information provided by individuals.

Any personal information you supply to MBIE in the course of providing your submission feedback is only:

- used for the purpose of assisting in the development of advice in relation to this consultation, or
- for contacting you about your submission.

MBIE may also use your personal information for other reasons permitted under the Privacy Act 2020 (for example, with your consent, for a directly related purpose, or where the law permits or requires it).

Please state clearly in your submission feedback if you do not want your name, or other personal information, included in any summary of submissions that MBIE may publish.

MBIE will only keep your personal information for as long as it is needed for the purposes for which the information may lawfully be used.

Where any information provided (which may include personal information) constitutes public records, it will be kept to the extent required by the [Public Records Act 2005](#).

MBIE may also be required to disclose information under the Official Information Act 1982, to a Parliamentary Select Committee or Parliament in response to a Parliamentary Question.

You have rights of access to, and correction of, your personal information. For more information, go to the MBIE website www.mbie.govt.nz.

Your information

MBIE would appreciate it if you would provide some information about yourself. This helps MBIE understand the impact their proposals may have on different occupational groups. Any information you provide will be stored securely.

A. About you

Name: Dr Chris Litten, General Manager Research, BRANZ

Email address: [redacted]

B. Can MBIE contact you if they have questions about your submission?

☒ Yes ☐ No

C. Are you making this submission on behalf of a business or organisation?

☒ Yes ☐ No

If yes, please add the name of your company or organisation.

BRANZ (Building Research Association of New Zealand)

D. Select your role or the best way to describe your organisation:

- | | |
|--|--|
| <input type="checkbox"/> Architect | <input type="checkbox"/> Designer (please specify below) |
| <input type="checkbox"/> BCA/Building Consent Officer | <input type="checkbox"/> Engineer (please specify below) |
| <input type="checkbox"/> Builder or tradesperson (please specify below) | <input type="checkbox"/> Residential building owner |
| <input type="checkbox"/> Building product manufacturer or supplier
(please specify the type of product below) | <input checked="" type="checkbox"/> Other (please specify below) |
| <input type="checkbox"/> Building resident, occupant or user (please
specify below) | <input type="checkbox"/> Prefer not to say |
| <input type="checkbox"/> Commercial building owner | |

Research and testing organisation

Your information

E. Personal information

The Privacy Act 2020 applies to feedback provided in all submissions.

- ☐ Please tick the box if you do **not** want your name or other personal information included in any information that MBIE may publish.

F. Publishing information

- ☐ MBIE may upload submissions, parts of submissions, or a summary of submissions received to its website. If you do **not** want part or all of your submission uploaded, please tick the box and say what you do not want uploaded and why below.

If you have ticked this box, please tell us what part(s) of your submission you do not want uploaded on MBIE's website and why.

[Please insert comments here]

G. Official information

The Official Information Act 1982 applies to all submissions received by MBIE.

- ☐ If you would like your submission (or parts of your submission) kept confidential please tick the box and **state** your reasons and ground(s) under sections 6, 7 and/or 9 of the Official Information Act that you believe apply, for consideration by MBIE.

If you have ticked this box, please tell us what parts of your submission you would like to be kept confidential, your reasons for this, and any grounds under the Official Information Act that you believe apply.

[Please insert comments here]

28 February 2025

Building System Performance
Ministry of Business, Innovation and Employment (MBIE)
PO Box 1473
Wellington 6140
via email: building@mbie.govt.nz

BUILDING CODE CONSULTATION ON INSULATION REQUIREMENTS IN HOUSING AND OTHER BUILDINGS

The Building Research Association of New Zealand (BRANZ) acknowledges the Government's work in responding to emerging issues in the implementation of new insulation requirements in housing. We welcome the opportunity to provide feedback on the design of proposed changes to Building Code acceptable solutions and verification methods for insulation and energy efficiency requirements.

Our feedback is provided here in both a general format (describing BRANZ, our work related to this area, and some broader, connected issues) and in direct response to the questions asked. Note that we have not responded to the questions relating to insulation in large buildings as we have no further feedback that is directly related.

ABOUT BRANZ

BRANZ's primary role is as an independent science and research organisation. BRANZ is the only national research institution focused exclusively on building and construction.

Our current priorities areas for new research are in four main areas:

- Affordability – housing is affordable for people to build, maintain and live in.
- Resilience – buildings protect people from earthquakes, fire, extreme weather and climate change.
- Sustainability – buildings are environmentally designed, built, maintained and recycled.
- Quality – buildings are safe, warm, dry and fit for future generations.

We welcome the opportunity to work with MBIE on exploring ways these research priorities can support the evidence base to these-and future-proposed changes.

Alongside research, BRANZ offers commercial, independent, science-based testing and assurance services. BRANZ has over 50 years of expertise in assessing products entering the market. Our assurance services give confidence to product suppliers (who choose to use them) that their materials should perform to the New Zealand Building Code (the Building Code) and associated regulations and standards, if properly used and/or installed.

BRANZ WORK IN THIS AREA

BRANZ has long-held expertise in applied building physics: Our ‘healthy homes’ team¹ focuses on research, resources and tools to reduce moisture and improve the insulation, ventilation and heating of our buildings.

To directly inform this consultation, BRANZ was commissioned by MBIE to undertake a technical analysis of the Building Code H1 energy efficiency clause settings for residential buildings². The aims of the study were two-fold:

- to test and compare the cost-effectiveness of the current settings and compliance methods to the previous settings, and
- to investigate if recent increases in insulation requirements may unintentionally cause new homes to overheat or suffer internal moisture problems.

This technical analysis is one piece that sits within larger body of recent (and recently funded-yet to commence) related research, including:

- The Household Energy End-use Project (HEEP2) - a national study to establish when and how energy is used in New Zealand homes.
- The multi-faceted project, Higher Performing Buildings – this will provide technical solutions to enable significant upgrades to new and existing buildings, aiming for buildings that perform in terms of energy efficiency, healthy environments and resilience to climate change.
- A collaborative project to design a framework to consider buildings (both retrofit and new) systemically, rather than as a collection of components. This will be a tool for industry to create long term plans for a building, factoring in risks such as overheating, moisture and indoor environmental quality. It will test current and future climate scenarios against reference buildings with the aim of improving building performance, durability and occupant health, while reducing carbon emissions.
- The Better Building Performance through Simulation project – research to develop industry-wide capability in building simulation, modelling and practice.

BRANZ SUPPORT FOR THE PROPOSED CHANGES

BRANZ agrees with the outcomes identified for the consultation in section 1.2.1 of the consultation document, being:

- Maintaining adequate energy efficiency in buildings.
- Balancing upfront building costs, and longer-term benefits.
- Removing barriers for designers to optimise insulation for energy efficiency in a building.
- Improving the consistency and certainty of compliance and consenting of buildings in regard to insulation requirements and energy efficiency.

¹ See <https://www.branz.co.nz/healthy-homes-research/> and <https://www.branz.co.nz/energy-efficiency/>

² Sullivan, J., Curtis, M., McNeil, S., Burgess, J., Butler, J. & MacGregor, C. (2024). *Technical analysis of New Zealand Building Code energy efficiency clause H1 settings for residential buildings*. BRANZ Ltd. Found here: <https://www.mbie.govt.nz/dmsdocument/29937-technical-analysis-of-new-zealand-building-code-energy-efficiency-clause-h1-settings-for-residential-buildings-pdf>

We expect the greatest impact of the proposed changes to be a widespread behavioural shift in the way buildings are considered, designed and built.

The proposed change to remove the schedule method as a compliance pathway for H1 energy efficiency for housing and small buildings will pave the way for:

- Increased flexibility in achieving compliance with H1 energy efficiency.
- Earlier engagement with the design of the building as a whole, or as a system.
- Improved understanding and consideration of whole-of-life running and carbon costs.
- Increased awareness of need to consider the Building Code clauses holistically.
- Increased knowledge of and familiarisation with the concept of holistic building design, which is prerequisite to the modelling method compliance pathway.

This last point is absolutely necessary to enable consideration of health, wellbeing and comfort outcomes for the occupant, for example, overheating. We understand that the consideration of occupant outcomes is limited in this consultation, as its focus is on H1 energy efficiency. We support the changes proposed as they will enable future uptake of modelling and building simulations, which will be essential in finding solutions to the likes of overheating.

The proposed change, from using the schedule method to using the calculation method, is a necessary step before there can be widespread understanding and uptake of future changes that may require use of modelling tools.

It is important to note, however, that care will be needed if a blanket removal of the schedule method occurs. The schedule method may continue to have a role with regards to rework, renovation and remediation, and when using or considering Alternative Solution compliance pathways.

SUGGESTIONS TO MITIGATE IMPLEMENTATION RISKS

Outlined below are suggested actions that will assist with the transition the sector will be required to make, if the proposed changes are implemented.

Support for the sector to upskill

The proposed changes will require skills uplift and behavioural shifts across the sector. For many, the changes will be a first step towards thinking differently and holistically about buildings. Although the calculation method is being used already, there is still widespread sector need for support to easily and consistently use it. This need will continue as and when the sector moves to modelling tools.

Targeted education campaigns may be required to run alongside free calculators and tools readily available³. For example, consenting officials will have particular knowledge requirements and skill needs.

³ Such as BRANZ's <https://www.branz.co.nz/energy-efficiency/h1-calculation-method-tool/> or NZGBC's <https://nzgbc.org.nz/building-code-h1-calculator>

A gradual transition

If the proposed changes were to go ahead, BRANZ suggests a gradual transition of 18-24 months, for several reasons:

- To ensure the sector is up-to-speed in using the calculation method;
- To think through some of the complexities, such as the unintended consequences of a blanket removal of the schedule method and the impact of no minimum R-value proposed for slab-on-ground floors;
- To ensure the tools are fully developed and accurate.

Further tool development and data needs

Both calculation and modelling tools need ongoing technical support and development (more so the modelling tools) to get the best out of them.

In particular, modelling tools require further development to ensure they meet international data input standards. For example, ensuring tools support the move towards hourly (rather than monthly) modelling data. BRANZ has research and expertise, is connected with international best-practice and is willing to assist with developments needed in this area.

There are opportunities for calculation and modelling tools to capture and enable the analysis of significant amounts of data. This would be data on how buildings are actually being designed and would support improved build quality and occupant health outcomes. Insights from such data will assist with future tools and guidance, and future Code changes. This is work that BRANZ is looking into and would be happy to discuss further.

Strategic and structural Building Code changes

As mentioned earlier, we understand that this consultation is limited to a focus on the Code's H1 energy efficiency clause. However, if beneficial outcomes for occupants are also to be considered, several Code clauses (e.g. E3 Internal moisture, G4 Ventilation and G5 Interior environment) will need joined-up consideration.

BRANZ recommends MBIE invest in a strategic, planned approach to consider related Code clauses and updates to them. BRANZ has research, insight and knowledge that can support this to occur.

The issue of overheating is a poignant example of this need: Anecdotal and soon-to-be released research insights⁴ tell us that buildings are getting warmer inside. Solving the issue of some buildings getting too warm will require consideration of several Code clauses simultaneously and holistically. It will also require evidence to inform and support any future actions, including those that sit outside of the current Code (such as defining 'overheating').

Dr Chris Litten
General Manager, Research, BRANZ

⁴ Insights from temperature monitoring in New Zealand homes over summer 2023-2024 (as part of the HEEP2 project) will soon be publicly available here: <https://www.branz.co.nz/healthy-homes-research/heap2-energy-use-living-conditions-in-nz-homes/>

Insulation in housing and small buildings

This section covers housing and small buildings. The proposals relate to ways to amend the acceptable solutions and verification methods for energy efficiency to

- Optimise insulation to better balance upfront building costs and longer-term benefits
- Improve the consistency and certainty of compliance and consenting

Optimising insulation to better balance upfront building costs and longer-term benefits

Questions for the consultation

Topic	Questions	Response
1	The schedule method may lead to higher upfront costs and less cost-effective construction than the more flexible calculation and modelling methods	
1-1	Do you support amending Acceptable Solution H1/AS1 as proposed to remove the schedule method?	<input checked="" type="checkbox"/> Yes, I support it <input type="checkbox"/> Yes, with changes <input type="checkbox"/> No, I don't support it <input type="checkbox"/> Not sure/no preference
1-2	<p>Removal of tabulated default R-values encourages industry to engage with the design of a building, enabling the consideration of local supply chain and cost sensitivity of different assemblies when specifying building systems.</p> <p>Having an industry that is actively engaging in the distribution of insulation in a design promotes better outcomes for building occupants. In the longer term this can only be a positive step forward. However, it should be noted that for a proper consideration of occupant outcomes modelling methods will need to be employed at a wider scale in the future.</p> <p>Also note that the calculation method does not calculate the heat loss of the building. More correctly, it provides an approximate whole-of-building heat transfer coefficient. In general, it is focussed on wintertime heat loss, and by its nature cannot consider excess solar gain or heat retention. While it is a useful metric, the temperature differences (and resulting heat flows) across each element are different in reality – understanding these effects in practice requires modelling methods.</p>	

Insulation in housing and small buildings

Topic	Questions	Response
	This is particularly important regarding overheating risk. If reduction in overheating is a desired outcome, dynamic (hourly) modelling is the preferred route. Monthly methods could be a useful stepping stone, but they can obfuscate issues, especially as overheating is a zonal issue.	

2	The calculation method contains restrictions to the flexibility of roof, wall and floor R-values that can lead to unnecessarily costly and complex construction in some buildings	
2-1	Do you support amending Acceptable Solution H1/AS1 to adjust the minimum possible R-values in the calculation method as proposed?	<input type="checkbox"/> Yes, I support it <input checked="" type="checkbox"/> Yes, with changes <input type="checkbox"/> No, I don't support it <input type="checkbox"/> Not sure/no preference
2-2	<p>There are two main points with this potential change:</p> <ol style="list-style-type: none"> 1. Removing the minimum R-values for slab on grade does put us in a similar position to that of the previous (4th edition) version of H1, where slab on grade was deemed to have a thermal resistance of R1.3, regardless of size, area-to-perimeter length (a/p) ratio, insulation etc. The benefit this change has over 4th edition of H1 is that the industry has to compensate for reduced slab thermal resistance via the calculation method. However, removing the minimum possible R-values as proposed should be considered carefully from an internal moisture perspective. Ideally this change would go hand-in-hand with an upgrade to Code clause E3. 2. With regards to the change in minimum wall R-values: It is important that what is reported for compliance is achieved in practice, or as close as reasonably practical without creating undue burden for industry. This is important for the industry to progress in delivering positive outcomes for homeowners and building occupants. The changes with respect to minimum wall R-values may be seen as a step backward, however it is more nuanced than that: Being more realistic about the amount of thermal bridging occurring in our buildings means we are being honest about what is current practice. Factoring in current practice is necessary to understanding and provide a baseline for future improvements and innovation. Frame and truss manufacturers are already reporting framing fractions to clients, and this practice will increase should these changes occur. This, in turn, is likely to stimulate some competition and improved resource efficiency in the sector. 	

Insulation in housing and small buildings

Topic	Questions	Response
	In addition to the above comments, alternatives to timber framed construction will need to be subjected to a similar exercise and have a default (agreed) amount of thermal bridging.	

3	Where underfloor heating is only used in bathrooms, the minimum R-values for heated floors may cause unreasonable upfront costs	
3-1	Do you support amending Acceptable Solution H1/AS1 and Verification Method H1/VM1 as proposed to reduce upfront costs and improve the cost-effectiveness of insulation by exempting building elements with embedded heating from higher minimum R-values where embedded heating systems are solely used in bathrooms?	<input checked="" type="checkbox"/> Yes, I support it <input type="checkbox"/> Yes, with changes <input type="checkbox"/> No, I don't support it <input type="checkbox"/> Not sure/no preference
3-2	This is a pragmatic step. Heated bathroom floors are not the primary heat source for a building. The percentage of floor area that bathrooms occupy is small for typical typologies, and raising thermal requirements for the whole slab is a significant cost. In addition, it is common for bathroom floor heating systems to be installed over a thin insulation backer.	

SQ1. What impacts from the proposals for topics 1 to 3 do you expect? These may be economic/financial, environmental, health and wellbeing, or other areas.

It is likely there would need to be a transition period (we suggest 18-24 months) with industry needing some support to take up the calculation method at scale. Since the tools already exist, this should be reasonably straightforward.

In terms of thermal performance of wall elements, it is likely that current practice will continue, with minimal impact on cost at the outset. The advantage in the mid-term should be increased competition and fairness in the sector as the alternative methods of construction will be on a level playing field with light timber frame.

Consideration will be needed of the effects (in terms of internal moisture) the proposed changes could have on a limited number of floor slabs with non-typical a/p ratios for example, small slabs.

In terms of the impact the proposed changes will have on occupant health outcomes, it is unlikely that the status quo will be affected directly. However, the proposed changes will be a necessary step if occupant health outcomes are to also be considered in the future. This shift (to consider occupant health) will require a sector-wide plan – one that is joined-up, predictable and creates positive change over an extended (e.g. 10 year) period.

Creating and maintaining a steady plan would give industry certainty and predictability, open up opportunities for investment and innovation, and have ongoing positive benefit for all New Zealand.

There are other factors outside the scope of the calculation method that would be useful to bring into a conversation about modelling method opportunities. As it currently stands there is a fundamental difference between simulation undertaken following H1/VM1 for compliance and computer modelling to inform design. Current work is underway at BRANZ in this space and we would welcome to be part of the conversation.

It's important to recognise that removal of the schedule method does not preclude what is effectively the schedule method R-values via the calculation method. It is a subtle point, but is important. What this will mean in practice is that industry will be able to take advantage of the glazing limit on the reference building

Insulation in housing and small buildings

to alter the proposed building. The net effect will likely be slightly lower overall performance, however this is already happening at a wide scale currently due to current uptake of the calculation method.

Removing the schedule method will likely lead to a marginal increase in greenhouse gas emissions from new residential buildings. This is because the existing calculation and modelling methods allow compliance with lower levels of insulation, creating a slight reduction in embodied emissions, but a greater increase in operational emissions over time from energy use.

SQ2. Is there any support that you or your business would need to implement the proposed changes for topics 1 to 3 if introduced?

BRANZ will need to (and is able to) make some minimal changes to our online tools and resources.

We expect industry, including BCAs, will require education and training, for example :

- There will be a need for coordination with BCAs to ensure consistency of implementation.
- Frame and truss manufacturers will require agreed methods for establishing framing percentages.
- Smaller operators who have defaulted to the schedule method may need additional support.

BRANZ has expertise and channels in this area and is ready to discuss ways we can assist and support the sector.

Insulation in housing and small buildings

SQ3. If there are other issues MBIE should consider to better balance upfront building costs and longer-term benefits of insulation in housing and small buildings, please tell us.

There is an ever-pressing need to a review Building Code clauses E3 Internal moisture, G4 Ventilation and G5 Interior environment and ensure alignment with this review of H1 Energy efficiency. To address outcomes for occupants, a 'building as a system' approach is required.

The issue of overheating is not assessed in the calculation method, so a clear understanding of how best to mitigate it is important. In order to give the industry flexibility to meet this challenge and design buildings that support occupant health, the clear way forward is the modelling method. This will require good guidance and significant upskilling across the sector. Achieving this is more likely than ever before, as computing is increasingly more affordable and there are several workstreams underway (both in New Zealand and overseas) aiming to create the tools and workflows to help.

Reducing barriers to mechanical ventilation is a critical step in avoiding internal moisture issues as we create better performing buildings. As noted in the work BRANZ undertook (commissioned by MBIE, see <https://www.mbie.govt.nz/dmsdocument/29937-technical-analysis-of-new-zealand-building-code-energy-efficiency-clause-h1-settings-for-residential-buildings-pdf>), the impact of moisture both within the living space and inside the structure itself (interstitially) are strongly dependent on the reliability of ventilation in the dwelling. Currently NZS4303 is up for potential review and we recommend accelerating this process to give industry additional compliance pathways that will enable industry to increase their capacity and capability to deliver effective ventilation.

In addition, opening a compliance route to take the energy impact of ventilation systems into account would be useful. The current default does not provide a compliance benefit for a modern airtight dwelling that is ventilated in a controlled manner. While we have made steady progress on airtightness without regulation (with the mean airtightness of new builds being <5ACH@50Pa in the last BRANZ survey⁵), there is still room for improvement. That being said, the potential energy gains due to reducing unintentional air leaks do suffer diminishing returns. The science is pointing to future improvements being based on the durability impact of air leaks (i.e. air leaks depositing moisture where it is not wanted, impacting durability), rather than on energy improvements.

Consistency and certainty of compliance and consenting

Questions for the consultation

Topic	Questions	Response
4	The modelling method includes requirements that are unclear or outdated	
4-1	Do you support amending Verification Method H1/VM1 as proposed to clarify and update requirements for the modelling method?	<input checked="" type="checkbox"/> Yes, I support it <input type="checkbox"/> Yes, with changes

⁵ Overton, G. & McNeil, S. (2020). Airtightness of selected apartments in New Zealand. BRANZ Study Report SR455. Judgeford, New Zealand: BRANZ Ltd.
Found here:
https://d39d3mj7qio96p.cloudfront.net/media/documents/SR455_Airtightness_of_selected_apartments_in_New_Zealand_1.pdf

Insulation in housing and small buildings

Topic	Questions	Response
		<input type="checkbox"/> No, I don't support it <input type="checkbox"/> Not sure/no preference
4-2	<p>Each of the changes are practical steps to mitigate some of the confusion and bring about consistency. Significant work was put into the latest iteration of the climate files, and they are much more representative of the conditions in each climate zone than what is currently being used.</p> <p>Specifying a narrow range of solar heat gain coefficient (SHGC) is a practical step to bring about more trustworthy and consistent models, as are changes to plug loads and internal heat gains.</p> <p>Adding a requirement to justify deviations from VM1 is a useful measure. However, there will need to be good guidance on this. BCOs are not necessarily modelling experts and there may be instances where poorly justified changes inadvertently get approved.</p> <p>BRANZ is undertaking research on the usefulness of AI in the context of the consenting system and it indicates that BCOs are consistently overburdened with excess information. A control or template on what these justifications look like could play an important part in assisting with additional burdens on both industry and consenting officers.</p> <p>Future iterations should look to include local shading and topography effects. They should also aim to support hourly modelling methods, which give more robust data on the risks of overheating, particularly on a room by room basis.</p>	

5	Thermal bridging from framing in walls is not adequately considered	
5-1	Do you support amending Acceptable Solution H1/AS1 and Verification Method H1/VM1 as proposed to better consider thermal bridging in framed walls?	<input type="checkbox"/> Yes, I support it <input checked="" type="checkbox"/> Yes, with changes <input type="checkbox"/> No, I don't support it <input type="checkbox"/> Not sure/no preference
5-2	<p>This is definitely a step forward with regards to being transparent about what is actually being delivered. Previous versions of H1 have had a number of exclusions that resulted in a significant proportion of framing being under reported.</p> <p>However, how alternatives to timber framing will report a reasonably reliable estimate of their true performance will need to be considered.</p> <p>There are thermal bridging possibilities for both SIPs and external insulation and ensuring these are reported accurately will require some work.</p>	

Insulation in housing and small buildings

Topic	Questions	Response
	This topic is closely linked to discussion on the different reference dimensions, which we cover in below.	

6	How the areas of roofs, walls and floors should be measured is unclear	
6-1	Do you support amending Acceptable Solution H1/AS1 and Verification Method H1/VM1 as proposed to improve certainty and consistency of compliance by requiring the areas of roofs, walls, and floors to be measured using overall internal dimensions?	<input checked="" type="checkbox"/> Yes, I support it <input type="checkbox"/> Yes, with changes <input type="checkbox"/> No, I don't support it <input type="checkbox"/> Not sure/no preference
6-2	<p>Yes. Combined with a reasonably representative framing fraction this proposed change will have a positive impact by reducing confusion in industry. It also aligns with practice in similar jurisdictions.</p> <p>While there is an argument that external dimensions should be used to simplify the process of correcting for thermal bridges in the future, the reality is a more nuanced:</p> <p>The Building Envelope Thermal Bridging Guide (BETB) [https://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/power-smart/builders-developers/building-envelope-thermal-bridging-guide-v1-6.pdf] produced for the building industry in British Columbia defaults to using internal dimensions.</p> <p>The main rationale for that is outlined in the section titled "A Note on Length and Area Take-offs for the Detail Oriented". In essence, it states that any possible errors introduced by mixing internal and external dimensions by practitioners will result in a slight over estimation of heat flow. This pragmatic step ensures that poorer performance does not result from inadvertently mixing measurement systems.</p> <p>The database used in the BETB could be a model used for New Zealand in the future. This would allow sharing of details and act as a common, consistent reference point, effectively reducing the workload on the design community.</p>	

7	NZS 4214 includes ambiguous instructions for determining the R-values of roofs, walls and some floors	
7-1	Do you support amending Acceptable Solution H1/AS1 and Verification Method H1/VM1 as proposed to improve certainty and consistency of compliance by providing clearer requirements for defining the boundaries of the bridged portion of a building element when calculating its R-value using NZS 4214?	<input type="checkbox"/> Yes, I support it <input checked="" type="checkbox"/> Yes, with changes <input type="checkbox"/> No, I don't support it <input type="checkbox"/> Not sure/no preference

Insulation in housing and small buildings

Topic	Questions	Response
7-2	Yes, however the wording is very cumbersome and could lead to misinterpretation. This would benefit from a set of diagrams to clarify what is meant.	

8	For some mixed-use buildings it is unclear whether H1/AS1 and H1/VM1 can be used, or H1/AS2 and H1/VM2	
8-1	Do you support amending Acceptable Solution H1/AS1 and Verification Method H1/VM1 as proposed to improve certainty and consistency of compliance by providing clearer requirements for determining which compliance pathways can be used for a mixed-use building?	<input checked="" type="checkbox"/> Yes, I support it <input type="checkbox"/> Yes, with changes <input type="checkbox"/> No, I don't support it <input type="checkbox"/> Not sure/no preference
8-2	Yes, steps to improve clarity and consistency are welcomed, with the potential to improve with outcomes for occupant.	

9	The look-up tables with R-values for slab-on-ground floors do not cater for some common situations	
9-1	Do you support amending Acceptable Solution H1/AS1 as proposed to make it easier for designers and Building Consent Authorities to establish whether a building complies with the H1 energy efficiency insulation provisions by enabling the use of the look-up tables for slab-on-ground floor R-values for more situations?	<input type="checkbox"/> Yes, I support it <input type="checkbox"/> Yes, with changes <input type="checkbox"/> No, I don't support it <input type="checkbox"/> Not sure/no preference
9-2	n/a	n/a

10	The look-up table with R-values for vertical windows and doors in housing misses some common glazing types	
10-1	Do you support amending Acceptable Solution H1/AS1 as proposed to make it easier for designers and Building Consent Authorities to establish whether a building complies with the H1 energy efficiency insulation provisions by enabling the use of the look-up table for vertical windows and doors in housing for more common types of glazing?	<input checked="" type="checkbox"/> Yes, I support it <input type="checkbox"/> Yes, with changes <input type="checkbox"/> No, I don't support it <input type="checkbox"/> Not sure/no preference
10-2	Yes.	

11	Acceptable Solution H1/AS1 and Verification Method H1/VM1 include obsolete provisions and definitions, and outdated references to documents and tools	
11-1	Do you support amending Acceptable Solution H1/AS1 and Verification Method H1/VM1 as proposed to make these documents more user-friendly and reduce the risk of misinterpretations that can create uncertainty and inconsistency of compliance?	<input checked="" type="checkbox"/> Yes, I support it <input type="checkbox"/> Yes, with changes <input type="checkbox"/> No, I don't support it

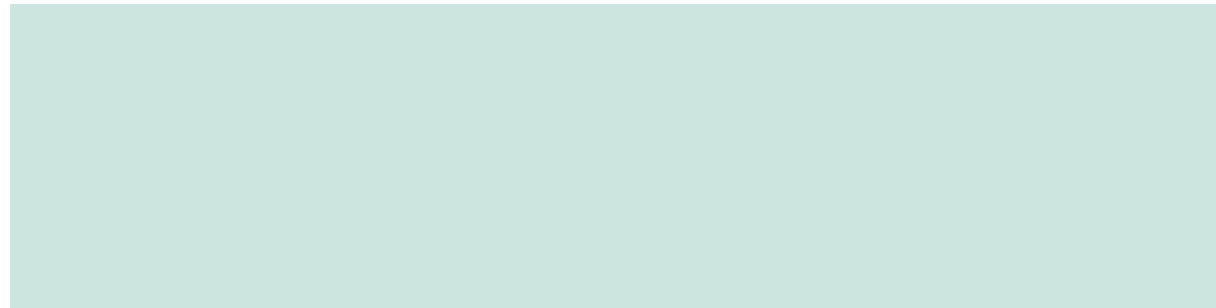
Insulation in housing and small buildings

Topic	Questions	Response
		<input type="checkbox"/> Not sure/no preference
11-2	Steps to improve clarity and consistency are welcomed. Consistent documentation enables efficiencies to be gained.	

SQ4. What impacts from the proposals for topics 4 to 11 do you expect? These may be economic/financial, environmental, health and wellbeing, or other areas.

SQ5. Is there any support that you or your business would need to implement the proposed changes for topics 4 to 11 if introduced?

SQ6. If there are other issues MBIE should consider to better support consistency and certainty of compliance and consenting for insulation in housing and small buildings, please tell us.



Transition period for residential and small buildings H1/AS1 & H1/VM1

SQ7. Do you agree with the proposed transition time of 12 months for the proposed changes to take effect?

- ☐ Yes, it is about right
- ☒ No, it should be longer (24 months or more)
- ☐ No, it should be shorter (6 months or less)
- ☐ Not sure/no preference

Please explain your views.

18-24 months in order to ensure sector is well prepared.

Managing overheating and internal moisture in homes

SQ8. If you think MBIE should support building designers with designing homes that safeguard building occupants from high indoor temperatures in summer (overheating) and other potential internal moisture risks, what approach should MBIE take?

Insulation in housing and small buildings

Both of these issues are complex in nature, however there is common ground between the two relating to the design and operation of our buildings.

An easy first step that could provide meaningful benefit in both areas would be to break down barriers to ventilation via mechanical means. Current compliance pathways (for residential buildings in particular) are not fit for this purpose. BRANZ encourages and supports MBIE's efforts already underway to improve this situation.

There is also a pressing need to transition the industry to modelling methods in future editions of the Building Code. Steps to transition do not need to be onerous, particularly for small building design. Some common standards in terms of how building form is captured would be useful to create a straightforward pathway. These would be standards to cover risks of overheating, incorporate site shading and other effects, in order to bring more reliability to models.

The addition of reliable ventilation (however it is achieved) is key to reducing moisture risk in our buildings, and this should also go hand-in-hand with reasonable levels of airtightness.

There are other measures that can be taken, including simulation tools etc to help understand risk profiles of our construction methodologies.

BRANZ has a collaboration with our equivalent institution in Germany over many years and has been part of the development of the WUFI suite of software. WUFI is one of the tools that could be used to help avoid potential failures. The challenge that lies ahead is in improving the knowledge and skills of the industry in regards to building physics, as well as having a reliable source of input data. While there is a growing number of practitioners in this space, the lack of a central knowledge hub is hampering their ability to produce reliable outputs, as training and knowledge are attained in an ad hoc manner. It is critical that there is a common language and understanding of these tools (and building physic concepts) for developments to happen in this area. This would need both training at universities and CPD courses being made available.

Insulation in large buildings

This section covers large buildings (other than housing). These are covered by the Acceptable Solution H1/AS2 and Verification Method H1/VM2. The proposals relate to ways to amend the acceptable solutions and verification methods for energy efficiency to

- Optimise insulation to better balance upfront building costs and longer-term benefits.
- Improve the consistency and certainty of compliance and consenting of buildings regarding insulation requirements and energy efficiency.

Optimising insulation to better balance upfront building costs and longer-term benefits

Questions for the consultation

Topic	Questions	Response
12	The schedule method may lead to less cost-effective construction than the more flexible calculation and modelling methods	
12-1	Do you support amending Acceptable Solution H1/AS2 as proposed to remove the schedule method?	<input type="checkbox"/> Yes, I support it <input type="checkbox"/> Yes, with changes <input type="checkbox"/> No, I don't support it <input type="checkbox"/> Not sure/no preference
12-2	Please explain your views	

13	The calculation method for large buildings does not provide flexibility for roof, skylight and floor R-values, limiting opportunities for optimising insulation	
13-1	Do you support amending Acceptable Solution H1/AS2 to allow flexibility for the R-values of all building elements in the calculation method as proposed?	<input type="checkbox"/> Yes, I support it <input type="checkbox"/> Yes, with changes <input type="checkbox"/> No, I don't support it <input type="checkbox"/> Not sure/no preference
13-2	Please explain your views	

14	Where underfloor heating is only used in bathrooms, the minimum R-values for heated floors may cause unreasonable upfront costs	
14-1	Do you support amending Acceptable Solution H1/AS2 and Verification Method H1/VM2 as proposed to reduce upfront costs and improve the cost-effectiveness of insulation by exempting building elements with	<input type="checkbox"/> Yes, I support it <input type="checkbox"/> Yes, with changes

Insulation in large buildings

Topic	Questions	Response
	embedded heating from higher minimum R-values where embedded heating systems are solely used in bathrooms?	<input type="checkbox"/> No, I don't support it <input type="checkbox"/> Not sure/no preference
14-2	Please explain your views	

SQ9. What impacts from the proposals for topics 12 to 14 do you expect? These may be economical/financial, environmental, health and wellbeing, or other areas.

[Please type here]

SQ10. Is there any support that you or your business would need to implement the proposed changes for topics 12 to 14 if introduced?

[Please type here]

SQ11. If there are other issues MBIE should consider to better balance upfront building costs and longer-term benefits of insulation in large buildings other than housing, please tell us.

[Please type here]

Consistency and certainty of compliance and consenting

Questions for the consultation

Topic	Questions	Response
15	The modelling method includes requirements that are unclear or outdated	
15-1	Do you support amending Verification Method H1/VM2 as proposed to clarify and simplify requirements for the modelling method?	<input type="checkbox"/> Yes, I support it <input type="checkbox"/> Yes, with changes <input type="checkbox"/> No, I don't support it <input type="checkbox"/> Not sure/no preference
15-2	Please explain your views	

16	The schedule method does not adequately limit heat losses and gains from skylights in large buildings	
16-1	Do you support amending Acceptable Solution H1/AS2 to introduce a limit on the skylight area in the schedule method in H1/AS2 (in case MBIE does not proceed with the proposed removal of the schedule method from H1/AS2)?	<input type="checkbox"/> Yes, I support it <input type="checkbox"/> Yes, with changes <input type="checkbox"/> No, I don't support it <input type="checkbox"/> Not sure/no preference
16-2	Please explain your views	

17	Thermal bridging from framing in walls is not adequately considered	
17-1	Do you support amending Acceptable Solution H1/AS2 and Verification Method H1/VM2 as proposed to better consider thermal bridging in framed walls?	<input type="checkbox"/> Yes, I support it <input type="checkbox"/> Yes, with changes <input type="checkbox"/> No, I don't support it <input type="checkbox"/> Not sure/no preference
17-2	Please explain your views	

18	How the areas of roofs, walls and floors should be measured is unclear	
18-1	Do you support amending Acceptable Solution H1/AS2 and Verification Method H1/VM2 as proposed to improve certainty and consistency of compliance by requiring the areas of roofs, walls, and floors to be measured using overall internal dimensions?	<input type="checkbox"/> Yes, I support it <input type="checkbox"/> Yes, with changes <input type="checkbox"/> No, I don't support it <input type="checkbox"/> Not sure/no preference
18-2	Please explain your views	

Insulation in large buildings

Topic	Questions	Response

19	NZS 4214 includes ambiguous instructions for determining the R-values of roofs, walls, and some floors	
19-1	Do you support amending Acceptable Solution H1/AS2 and Verification Method H1/VM2 as proposed to improve certainty and consistency of compliance by providing clearer requirements for defining the boundaries of the bridged portion of a building element when calculating its R-value using NZS 4214?	<input type="checkbox"/> Yes, I support it <input type="checkbox"/> Yes, with changes <input type="checkbox"/> No, I don't support it <input type="checkbox"/> Not sure/no preference
19-2	Please explain your views	

20	For some mixed-use buildings it is unclear whether H1/AS1 and H1/VM1 can be used, or H1/AS2 and H1/VM2	
20-1	Do you support amending Acceptable Solution H1/AS2 and Verification Method H1/VM2 as proposed to improve certainty and consistency of compliance by providing clearer requirements for determining which compliance pathways can be used for a mixed-use building?	<input type="checkbox"/> Yes, I support it <input type="checkbox"/> Yes, with changes <input type="checkbox"/> No, I don't support it <input type="checkbox"/> Not sure/no preference
20-2	Please explain your views	

21	The look-up tables with R-values for slab-on-ground floors do not cater for some common situations	
21-1	Do you support amending Acceptable Solution H1/AS2 as proposed to make it easier for designers and Building Consent Authorities to establish whether a building complies with the H1 energy efficiency insulation provisions by enabling the use of the look-up tables for slab-on-ground floor R-values for more situations?	<input type="checkbox"/> Yes, I support it <input type="checkbox"/> Yes, with changes <input type="checkbox"/> No, I don't support it <input type="checkbox"/> Not sure/no preference
21-2	Please explain your views	

22	Acceptable Solution H1/AS2 and Verification Method H1/VM2 include obsolete provisions and definitions, and outdated references to documents and tools	
22-1	Do you support amending Acceptable Solution H1/AS2 and Verification Method H1/VM2 as proposed to make these documents more user-friendly and reduce the risk of misinterpretations that can create uncertainty and inconsistency of compliance?	<input type="checkbox"/> Yes, I support it <input type="checkbox"/> Yes, with changes <input type="checkbox"/> No, I don't support it <input type="checkbox"/> Not sure/no preference
22-2	Please explain your views	

Insulation in large buildings

Topic	Questions	Response

SQ12. What impacts from the proposals for topics 15 to 22 do you expect? These may be economical/financial, environmental, health and wellbeing, or other areas.

[Please type here]

SQ13. Is there any support that you or your business would need to implement the proposed change if introduced?

[Please type here]

SQ14. If there are other issues MBIE should consider to better support consistency and certainty of compliance for insulation in large buildings other than housing, please tell us.

[Please type here]

Transition period for large buildings H1/AS2 & H1/VM2

SQ15. Do you agree with the proposed transition time of 12 months for the proposed changes to take effect?

- ☐ Yes, it is about right
- ☐ No, it should be longer (24 months or more)
- ☐ No, it should be shorter (6 months or less)
- ☐ Not sure/no preference

Please explain your views.

[Please type here]

Thank you

Thank you for your feedback. MBIE really appreciates your insight because it helps us identify the needs of New Zealanders and your thoughts on energy efficiency and insulation in buildings.

If you have anything else you would like to tell MBIE about energy efficiency in the Building Code, please leave your feedback below.

[Please type here]

