



BRANZ *House insulation guide* goes digital

The newly released 6th edition of the BRANZ *House insulation guide* will allow designers to quickly evaluate the effect of varying construction parameters. It will be useful to demonstrate compliance under the new H1, as well as exploring options for higher performance.

Introduction of the 5th edition updates of the New Zealand Building Code clause H1 Energy efficiency H1/AS1 and H1/VM1 has expanded the tools required to work within these frameworks.

At BRANZ, one large task to support this change has been updating the BRANZ *House insulation guide* (HIG) to the 6th edition. All previous versions can no longer be used for compliance from 3 November 2022.

Move to interactive digital format

Readers who are familiar with previous editions of the HIG will see similar information but in a completely new digital format.

Previously, a hardcopy book was published and updated every few years. It covered about 105 common construction types divided between roof, wall and floor components. For each construction type, graphs and tables were used to relate the R-value of the insulation material used to the theoretical total construction R-value achieved and vice versa.

The HIG 6th edition has been released in a digital format only so it can be updated easily and is available to download from the BRANZ website.

The principal science underpinning the HIG remains the same, but the range

of construction typologies in the 6th edition has expanded. Extensive BRANZ modelling has increased the accuracy and precision of the calculations and provides increased potential for expansion into new aspects of evaluation of the thermal envelope in future designs.

Starting the design process

The process for use begins the same – consult the latest MBIE compliance path documentation (for example, H1/AS1 5th edition amendment 1) to establish the energy efficiency requirements of the various elements of a new house in the relevant climate zone.

Note that Aotearoa New Zealand was previously divided into just three climate zones, but this has now been upgraded to six more-specific climate zones.

These climate zones will identify the required R-values of the various building envelope elements that will govern the building's design or that of the reference building if you are using either the calculation or modelling methods.

Two parts to HIG

The updated HIG is in two parts, beginning with an introductory text explaining how to use the new version. Subjects include:

- statutory requirements
- overheating
- moisture management – including Building Code clause E3 *Internal moisture*
- efficient installation of insulation
- calculating R-values
- current best-practice guides for floor, wall and roof constructions.

There are also new or expanded sections that cover thermal bridging, floor slab area-to-perimeter ratios, retrofitting insulation (which is becoming far more critical) and embodied carbon, among others.

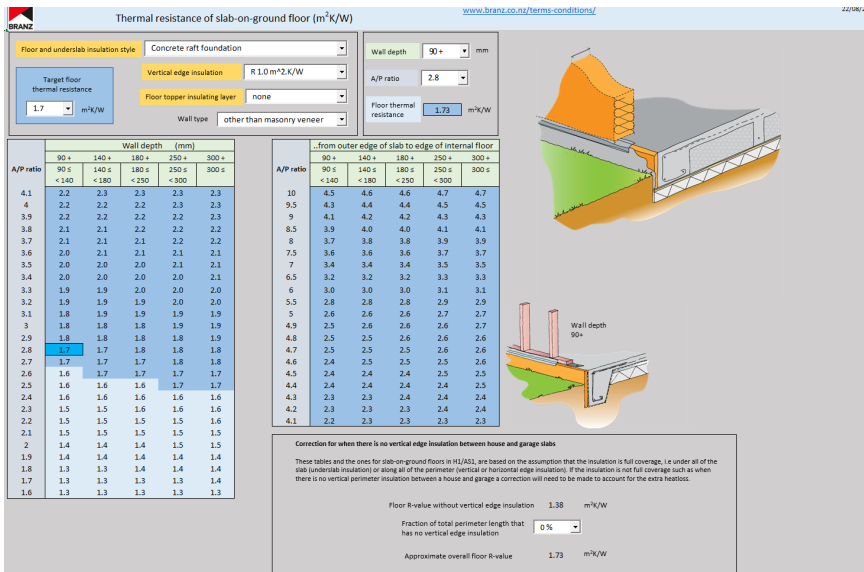
Construction R-values in tables

The greatest change has occurred in Part 2.

The 5th edition presented the construction R-values and insulation material R-values in graphs for each construction type showing stud and dwang spacings and commonly assumed percentage framing ratios for walls.

In the HIG 6th edition, the graphs have been superseded by tables or spreadsheets of construction R-values. These can be fine-tuned with the selection of drop-down options such as framing sizes and percentage framing ratios, insulation R-values and other construction criteria.

Users can only select from the drop-down options – they cannot type in specific numbers. They can interpolate

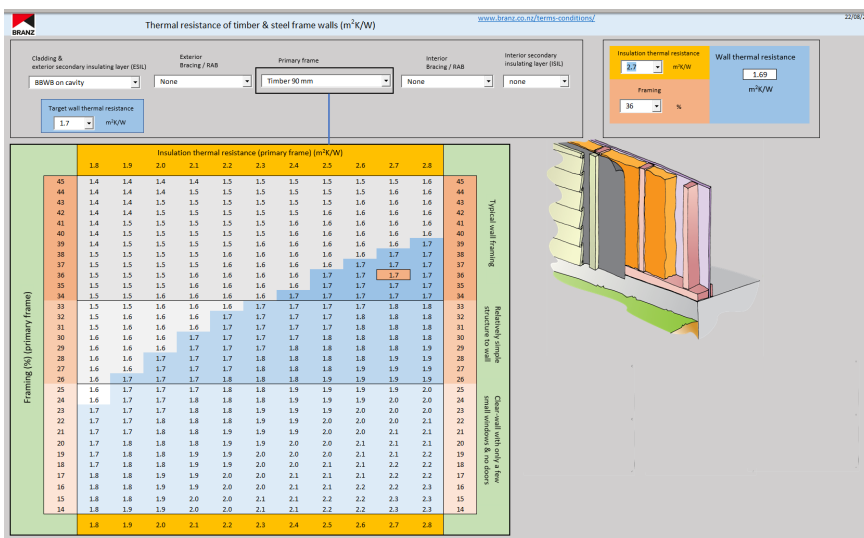


Easy visual cue for higher-performing design

HIG can be useful far beyond demonstrating compliance with H1 for building consent applications. The spreadsheet provides a quick visual cue to the designer as they get near to a compliant solution. However, it can also provide a sense of where the selected typology can be extended for a superior higher-performing option – often with minimum extra outlay.

For example, a consent-compliant wall may have an insulation product with a specific R-value but an adjacent option on the spreadsheet may illustrate a similar wall configuration option with a higher construction R-value, at minimal extra cost.

The decision could be to consciously exceed the H1 minimum for a wall or a roof. The alternatives can be quickly evaluated and a superior option chosen with immediate confirmation of the degree of thermal performance gain that will be achieved.



Figures 1 and 2: Typical screenshots of BRANZ House insulation guide construction R-values.

between adjacent sizes to establish intermediate values.

Higher wall framing ratios

Research found wall framing ratios used in HIG 5th edition were overly optimistic when evaluated against actual ratios. Data for more realistic higher framing ratios is provided. The submitted R-value must include top and bottom plates, studs and full-depth dwangs (H1/AS1 2.1.4.3b).

Easy to try different options

The change from graphs to tables will allow more flexibility, and designers will be able to quickly evaluate the effect of varying construction parameters. The

tables change – including the colour – in real time as options are tried (see Figures 1 and 2). This helps the designer gauge if they are amending parameters that will help to achieve their target in an almost intuitive way.

This is part of the push to make the revised HIG not only more accurate but also more user friendly.

Enabling quick real-time evaluation of the thermal performance of various construction scenarios is an extremely powerful design tool. It is reassuring to know that the construction R-values that are generated are being calculated using the methodology specified in H1/AS1 and H1/VM1 5th edition amendment 1.

Making it easier to deliver warmer, drier housing

Architects and designers will be familiar with the mantra that we should strive to produce new and renovated buildings and homes that are warm, dry and healthy.

Never forget that Building Code compliance is achievement of the minimum required level – the HIG 6th edition will be an important tool to help us aim higher. It will also be integral as we move towards the more bespoke solutions evolving as we embrace the alternative building consent compliance path solutions such as the calculation and modelling methods.

At BRANZ, we are also excited that this new generation HIG will be one of the tools that will grow and evolve as part of the solutions to address the building design and construction challenges we face as we move to building for climate change.

As the HIG 6th edition is now a living document, we can more nimbly accommodate new building typologies as they evolve – incorporating new elements of building design and performance criteria as we learn and grow to keep up with our rapidly changing environment.

FOR MORE The HIG is available from www.branz.co.nz/house-insulation-guide.