

The Architect's Guide to H1 Standards for Windows & Doors





About this guide

In late 2021, MBIE revealed major changes to the New Zealand Building Code's H1 energy efficiency rules. These updates mark the biggest advancements in over a decade.

In this guide, we outline the key H1 changes for windows and doors in both residential and commercial buildings.

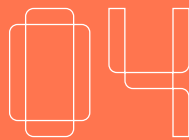
*This guide includes the latest information on the NZ Building Code changes as of February 2023.



Contents



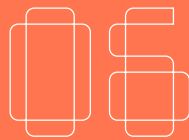
Timeline for the
H1 changes



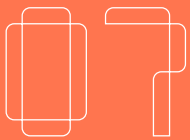
Location and
climate zone



Building
classification



The updated H1
Insulation Standards



Calculation methods
for window insulation



Frequently
Asked Questions



Dates for H1 changes

Before we explain what the changes entail, it's worth noting that the revised requirements are being introduced on an interim basis. The deadline for each increase depends on the **climate zone** of your project. The timeline is as follows:



2 November 2022:

First interim increase for all zones

If your consent application was submitted on or after this date, your project is required to meet the first interim increase to R0.37 for all residential buildings. This applies to all six climate zones. (Commercial buildings changes apply from this date and have no interim increase - see H1 table below for applicable R values).



1 May 2023:

For residential buildings only

From this date, climate zones 3 to 6 must meet the revised minimum standard as laid out above. Zones 3 & 4 will increase to R0.46 and Zones 5 & 6 will increase to R0.50. Note that this deadline has been extended from 2 November 2022 to relieve pressure on the residential construction sector.



3 November 2023:

For residential buildings only

From this date, climate zones 1 and 2 are required to meet the final increase to R0.46. Note that these warmer zones have been set to increase later to allow the construction sector more time to prepare.



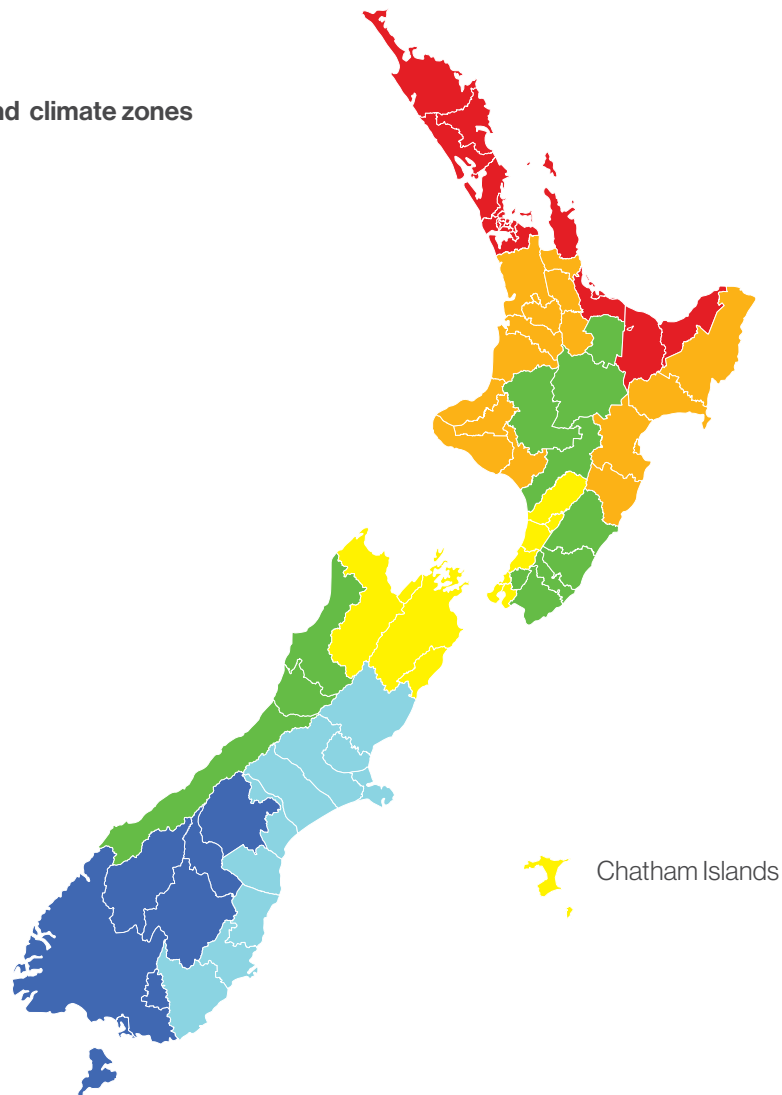
Location and climate zone

To enhance the effectiveness of our insulation standards, a revised set of climate zones has been introduced. The requirements are now based on the average temperature and weather patterns of the building's location.

The increased insulation standards will be enforced in stages, with the coldest climate zones increasing first. To allow the construction industry time to adapt, the requirements for the two warmest climate zones are being introduced later in 2023.

Map of New Zealand climate zones

- Climate zone 1
- Climate zone 2
- Climate zone 3
- Climate zone 4
- Climate zone 5
- Climate zone 6





Building classification

To determine which H1 standards your project must comply with, you first need to determine which type of building it is. The relevant classification will determine which building code regulations must be followed. This is critical in terms of the design, construction, and maintenance of the building. The classifications include:

Housing

These buildings are used primarily as residential dwellings and contain internal management services. There are three types: detached dwellings, multi-unit dwellings, and group dwellings. These are all subject to **H1/AS1** standards.

Communal residential

Applies to buildings where assistance or care is extended to the principal users. There are two types: community care and community service. Examples include hostels, hotels, retirement villages, and hospitals.

Communal non-residential

This applies to a building which serves as a meeting place for people where care and services are provided by people other than the principal users. There are two types: assembly service and assembly care. Examples of these include churches, schools, and museums.

Commercial

This term applies to a building in which resources, goods, services, or money are developed, sold, exchanged or stored. For example, this may include car parks, offices, restaurants, and shops.

- Commercial buildings that are smaller than 300m² qualify as 'light commercial'. In some cases, the applicable standards are similar to those of residential buildings, though there are a few exceptions that are shown below.
- Commercial buildings that are greater than 300m² will qualify as 'large commercial' buildings and therefore be subject to a different set of H1 standards. We will examine these in more detail later in this guide.

Industrial & Outbuildings

Please note that H1 compliance is not required for industrial buildings such as a warehouse and outbuildings such as a garage.



The updated H1 Insulation Standards

The updated insulation requirements in the New Zealand Building Code mark a significant increase in the minimum R-value of various building components.

We outline the minimum R-value requirements for the window component in the table below, including the difference between residential buildings, small commercial buildings, and large commercial buildings.

In terms of window insulation, all new buildings smaller than 300m² must comply with H1/AS1 and H1 VM1. All buildings larger than 300m² must comply with H1/AS2 and H1 VM2. These new standards enforce a significant increase in the required R-value for windows in all 6 climate zones.

Classification	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
Residential Buildings	R0.46*	R0.46*	R0.46	R0.46	R0.50	R0.50
Commercial buildings smaller than 300m²	R0.37	R0.37	R0.46	R0.46	R0.50	R0.50
All buildings larger than 300m²	R0.33	R0.33	R0.37	R0.37	R0.40	R0.42

*For building consent applications submitted before 2 November 2023, the minimum construction R-values for windows and doors in residential buildings in climate zones 1 and 2 are permitted to be reduced to R0.37 m²K/W.



Tips

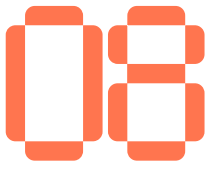
Please note that H1 compliance is not required for industrial buildings such as a warehouse and outbuildings such as a garage. However, if you are incorporating an office block in the front of an industrial building, the office portion must comply with the commercial requirements of the H1 code.

Calculation methods for window insulation

To calculate the R-value and efficacy of your project's window insulation, there are three methods you can use. These include:

- The Schedule method
- The Calculation method
- The Modelling method





The Schedule Method

For this method, you will identify the R-value achieved by combining the window components from the table below. The [previous table](#) shows the minimum required R-values for windows in each of the six climate zones.

This method can be used in residential projects when all of the following criteria apply:

- The glazing area is 30% or less of the total wall area.
- The combined glazing area on the east, south, and west-facing walls are 30% or less of the combined total area of these walls.
- The skylight area is no more than 1.5m² or 1.5% of the total roof area.
- The opaque door area is no more than 6m² or 6% of the total wall area.

How to use the Schedule Method:

1. Identify the [residential R-value requirements](#) for your project's climate zone.
2. Refer to the Configuration R-values table below. This table shows which products you can specify to meet the climate zone requirement.

Configuration R-values

Frame	Double glazing type	Glass U value	R-value	Notes
Non-thermal aluminium	Clear double-glazing	U2.63	R0.26	Previous R-value requirement.
Non-thermal aluminium	Clear Low-E Lightbridge with argon gas	U1.1	R0.37	The current minimum for climate zone 1-6 until May 2023. Zones 1 and 2 remain at R0.37 until November 3rd 2023.
Thermally improved aluminium	Clear double-glazing	U2.6	R0.32	
Thermally improved aluminium	Clear Low-E Lightbridge with argon gas	U1.1	R0.50	Minimum requirement for zones 3 and 4 is R0.46 from May 2023. This will be the minimum requirement for all zones from November 23.
Thermally improved aluminium	Clear Low-E Performatech with argon gas	U1.1	R0.50	Minimum requirement for zones 5 and 6 from May 2023.
Thermally improved aluminium	Clear Low-E Lightbridge krypton gas	U0.9	R0.54	



Calculation Method

Used for buildings where the glazing area is 40% or less of the total wall area, the calculation method compares the proposed building with the reference building. The reference building must be insulated in accordance with the Schedule method.

The building is compliant with the calculation method if its heat loss is less than or equal to that of the reference building. A combination of roof, wall, floor, window, door and skylight insulation is allowed if products differ from [the table](#), but only if the proposed building performs as well as the reference building.

In some cases, the R-values of the building elements that form the thermal envelope will differ from those outlined in the Schedule method. If this is the case, you can use [subsection 2.1.2](#), providing the heat loss of the proposed building is less than or equal to the heat loss of the reference building.

The heat loss of the reference building should be calculated using the equations in [Table 2.1.3.4A](#). Alternatively, [Table 2.1.3.4B](#) can be used for residential building consent applications submitted before 1 May 2023.

How to use the Calculation Method:

1. Refer to [H1/AS1](#) section 2.1.3, [NZBCH1](#), or the [BRANZ calculator tool](#).
2. Send your plans to UNO Windows & Doors.
3. We will supply the construction R-value report, as well as certification to assist your compliance with the Building Code.



Note that using UNO non-thermal and thermal frames with the calculation method will achieve a higher construction R-value than those noted in the table above. This will allow you to reduce insulation in other areas, such as roofs or walls.



The Modelling method H1/VM1

Taking it a step further than the calculation method, the modelling method assesses the energy performance of a proposed building by using a simulation. The simulation building has the same shape, dimensions, and orientation as the proposed building, allowing you to predict the building's heating loads and cooling loads.

For building elements that contain embedded heating systems, refer to [Table 2.1.2.2A](#). For building elements that do not contain embedded heating systems, refer to [Table 2.1.2.2B](#). Alternatively, refer to [Table 2.1.2.2C](#) for residential building consent applications submitted before 1 May 2023.

How to use the Modelling Method:

1. Refer to [H1VM1](#) section D.1. Identify the construction R-values for the vertical windows and doors, opaque doors, and the solar heat gain coefficient for any glass in the proposed thermal envelope.
2. Send your plans to UNO Windows & Doors.
3. We will supply the construction R-value report, as well as the solar heat gain coefficient and certification to assist your compliance with the code.



Thank you for specifying UNO Windows and Doors for your project.
It is our pleasure to supply you with our:

UNO Project R-Value Certificate

ABC Building Ltd

Issued To

ABC Townhouses

Project

123 High St, Downtown, New Zealand

Project Address:


Signature

28 November 2023

Date

0.46 m²K/W

Construction R-Value

The thermal transmission coefficients U were determined according to EN ISO 10077-1:2017.
Calculated by LogiKal U value module version 1.0.0 in compliance with ift guideline WA-05/2 - ift test report 12-000309-PRO1(PB-A01-06-de-01).
The input data of this calculation was not verified by the ift. These input values must be used by appropriate verification as further applicable documents. The ift assumes no liability for the correctness of the thermal transmittance calculation.

Frequently Asked Questions

In this section, we address common questions from architects about the H1 Standards. To ensure successful implementation in your next project, read our explanations below.

When do the changes come into effect?

The first interim increase happened in November 2022. The next increase applies to climate zones 3, 4, 5 and 6, and takes place on May 1st 2023. The following increase applies to zones 1 and 2, and takes place on November 3rd 2023. The interim increases only apply to residential buildings.

[Read more →](#)

Will it increase building costs?

Meeting H1 insulation standards will come at a higher cost because of the higher quality materials required. However, long-term energy efficiency makes it a wise investment.

[Read more →](#)

What is an R-value?

R-values measure a material's ability to resist heat flow, which can vary based on thickness, heat direction, and composition. The higher the R-value, the greater the insulation and performance.

[Read more →](#)

Are thermally-insulated windows worth it?

With increased energy savings, longer-lasting window frames, improved sound insulation and condensation-free windows, thermally-broken window frames are well worth the investment. Additionally, they make the compliance process much smoother.

[Read more →](#)

How can I communicate the value of thermal windows?

To convey the benefits of thermal windows to your clients, start by calculating the potential energy savings over time. Secondly, make sure to specify them early in the planning process.

[Read more →](#)

Where can I download DWGs and specification documents?

Our DWGs and technical files are all available on our website. These include specifications and profiles for our windows, glass doors, and entrance doors.

[Find the file here →](#)





Our **vision** is to change the way people buy windows and doors

Our **mission** is to create better spaces to work, live and play in

**Simplified process
+ better quality
outcomes**

More than supplying windows and doors, we deliver high-quality end-to-end solutions. We streamline each step of the project timeline and are focused on providing the most value for our partners, clients, and customers.

**We do more
for you**

At UNO, we strive to create healthier homes and buildings for all New Zealanders. For us, it's not just about the decisions you make at the time of the project. We also help you make an ongoing positive impact on your clients.

Any questions?

At UNO Windows & Doors, we're here to help. For more advice and effective solutions, chat to one of our friendly team.

enquiries@unowindows.co.nz
06 272 9080

unowindows.co.nz

