

Please return this form to: building@adc.govt.nz or Ashburton District Council, PO Box 94, Ashburton 7740

<p>New Zealand Building Code Clause H1 requires that all buildings constructed for housing provide adequate thermal resistance. This is determined by Climate Zones as defined in NZS 4218:2004 and is measured by the Building Performance Index. The Building Performance Index is verified by one of three methods as prescribed by NZS 4218:2004 And NZBC H1. These methods are the Scheduled, Calculation, and Modelling Methods. The following exercise will help determine which method must be used.</p>		
Project Location:		
Description of Work:		
Background:		
Step One: Building Type and Climate Zone		
Floor Area:		
Is this a residential building or commercial building less than 300m ² ? If yes , proceed to 'Step Two'. If no , refer to NZS 4245 Energy Efficiency_Large Buildings	Yes	No
South Island	Zone 3	
Step Two: North Wall		
Area of North Wall (including glazing)	m ²	
Area of glazing on North Wall	m ²	
Percentage of glazing to North Wall (Glazing/Wall Area)	%	
Step Three: East, South and West Walls		
Area of East, South, and West walls (including glazing)	m ²	
Area of Glazing to East, South and West Walls	m ²	
Percentage of glazing to East, South and West Walls	%	
Step Four : Area of Sky Lights		
Area of Skylights (including frame)	m ²	
Method of Compliance		
Compliance Details	Acceptable Method	Y/N
Is the Area of Glazing less than 30%?	Scheduled Method	
Is the Area of Skylights less than 1.2m ² ?	Scheduled Method	
If the answer to either of the above is no .	Calculation Method/ Modelling Method	
Is the Area of Glazing Greater Than 50%?	Modelling Method	

Note: The following tables show the minimum R-values required by the New Zealand Building Code. These are not the insulation material values but the R value of the overall building element. If the Calculation or Modelling Method is used calculations and worksheets must be provided.

Replacement Table 1:	Non-solid construction – minimum R-values for schedule method (only where area of glazing is 30% or less of total wall area)		
Building thermal envelope component	Minimum R-values (m ² °C/W)		
	Climate zone 1	Climate zone 2	Climate zone 3
Roof	R 2.9	R 2.9	R 3.3
Wall	R 1.9	R 1.9	R 2.0
Floor	R 1.3	R 1.3	R 1.3
Glazing (vertical)	R 0.26	R 0.26	R 0.26
Glazing (skylights)	R 0.26	R 0.26	R 0.31

NOTE:

- (1) The R-values given in this table are those applicable to the reference building as described in this Standard (NZS 4218).
- (2) Climate zone boundaries are shown in Appendix B (of NZS 4218).
- (3) If the sum of the area of glazing on the East, South and West facing walls (see Appendix H of NZS 4218) is more than 30% of the total wall area of all of these walls, then the calculation or modelling method shall be used.
- (4) Carpets or floor coverings are not included in the floor R-value. The floor R-value is met by concrete slab-on-ground and suspended floors with continuous closed perimeter with 100 mm draped foil. Exposed floors will require additional treatment (e.g. pole houses).
- (5) The R-values for glazing refer to whole window R-values (glass and frame). The values in this table are for a standard WERS window (see Appendix G of NZS 4218). Any proposed area of glazing shall be considered to have an R-value as given in Appendix G (of NZS 4218).
- (6) There are no R-value requirements for the opaque parts of a door or a door set.
- (7) Total area of skylights must be no more than 1.2 m². The calculation or modelling methods must be used for designs where the total area of skylights is more than 1.2 m².
- (8) An R-value of 0.26 m² °C/W may be used for traditional leadlight glass when the total area of leadlight glass is no greater than 2.6 m² and either the schedule method or calculation method is used.

**Replacement
Table 2(a):**

**Solid timber construction – alternative minimum R-values for schedule method
(only where area of glazing is 30% or less of total wall area)**

Building thermal envelope component	Minimum R-values (m ² °C/W)					
	Climate zone 1		Climate zone 2		Climate zone 3	
	Option 1a	Option 1b	Option 2a	Option 2b	Option 3a	Option 3b
Roof	R 3.5	R 3.5	R 3.5	R 3.5	R 3.5	R 3.5
Walls – external 75 mm thick and timber framed internal walls	R 1.3	R 1.0	R 1.4	R 1.1	R 1.6	R 1.2
Walls – external 60 mm thick and solid timber internal walls 45 mm thick	R 1.0	R 0.8	R 1.3	R 1.0	R 1.6	R 1.2
Walls – external 90 mm thick and solid timber internal walls 45 mm thick	R 1.0	R 0.8	R 1.2	R 0.9	R 1.4	R 1.1
Walls – external 60 mm thick and solid timber internal walls 60 mm thick	R 1.0	R 0.8	R 1.2	R 0.9	R 1.4	R 1.1
Floor	R 1.3	R 1.3	R 1.3	R 1.3	R 1.3	R 1.3
Glazing (vertical)	R 0.26	R 0.31	R 0.26	R 0.31	R 0.26	R 0.31
Glazing (skylights)	R 0.26	R 0.31	R 0.26	R 0.31	R 0.31	R 0.31

NOTE:

- (1) The R-values given in this table are those applicable to the reference building as described in this Standard (NZS 4218).
- (2) Climate zone boundaries are shown in Appendix B (of NZS 4218).
- (3) If the sum of the area of glazing on the East, South and West facing walls (see Appendix H of NZS 4218) is more than 30% of the total wall area of all of these walls, then the calculation or modelling method shall be used.
- (4) Carpets or floor coverings are not included in the floor R-value. The floor R-value is met by concrete slab-on-ground and suspended floors with continuous closed perimeter with 100 mm draped foil. Exposed floors will require additional treatment (e.g. pole houses).
- (5) The R-values for glazing refer to whole window R-values (glass and frame). The values in this table are for a standard WERS window (Appendix G of NZS 4218). Any proposed area of glazing shall be considered to have an R-value as given in Appendix G (of NZS 4218).
- (6) There are no R-value requirements for the opaque parts of a door or a door set.
- (7) Total area of skylights must be no more than 1.2 m². The calculation or modelling methods must be used for designs where the total area of skylights is more than 1.2 m².
- (8) An R-value of 0.26 m² °C/W may be used for traditional leadlight glass when the total area of leadlight glass is no greater than 2.6 m² and either the schedule method or calculation method is used.
- (9) The R-values specified in Options 1b, 2b and 3b may only be used in the schedule method, i.e. shall not be used in the calculation or modelling methods.
- (10) When using R-values for either Options a or b, in relation to any of the three climate zones, all R-values for that option shall be used, i.e. roof, wall, floor and glazing. The R-values for a single building component shall not be substituted from one option to another.
- (11) At least 85% of internal walls must be solid timber when using the wall R-values for solid internal and external walls.
- (12) Table 2(a) allows buildings of solid timber construction to have lower R-values than buildings of non-solid construction, due to the benefits of appropriate use of thermal mass. Thermal mass must be used in conjunction with good passive design to increase comfort and reduce energy use. Use of the R-values in table 2(a) requires that the thermal mass is accessible, i.e. inside the insulated building envelope. If additional bulk insulation material is required to achieve the R-values in this table, this insulation must be installed on the outside of the wall.

**Replacement
Table 2(b):**

Solid construction (excluding solid timber) – alternative minimum R-values for schedule method (only where area of glazing is 30% or less of total wall area)

Building thermal envelope component	Minimum R-values (m ² °C/W)					
	Climate zone 1		Climate zone 2		Climate zone 3	
	Option 1a	Option 1b	Option 2a	Option 2b	Option 3a	Option 3b
Roof	R 3.5	R 3.5	R 3.5	R 3.5	R 3.5	R 3.5
Wall	R 0.8	R 0.8	R 1.0	R 0.9	R 1.2	R 1.0
Floor	R 1.5	R 1.3	R 1.5	R 1.3	R 1.5	R 1.3
Glazing (vertical)	R 0.26	R 0.31	R 0.26	R 0.31	R 0.26	R 0.31
Glazing (skylights)	R 0.26	R 0.31	R 0.26	R 0.31	R 0.31	R 0.31

NOTE:

- (1) The R-values given in this table are those applicable to the reference building as described in this Standard (NZS 4218).
- (2) Climate zone boundaries are shown in Appendix B (of NZS 4218).
- (3) If the sum of the area of glazing on the East, South and West facing walls (see Appendix H of NZS 4218) is more than 30% of the total wall area of all of these walls, then the calculation or modelling method shall be used.
- (4) Carpets or floor coverings are not included in the floor R-value. The floor R-value is met by concrete slab-on-ground and suspended floors with continuous closed perimeter with 100 mm draped foil. Exposed floors will require additional treatment (e.g. pole houses).
- (5) The R-values for glazing refer to whole window R-values (glass and frame). The values in this table are for a standard WERS window (Appendix G of NZS 4218). Any proposed area of glazing shall be considered to have an R-value as given in Appendix G (of NZS 4218).
- (6) There are no R-value requirements for the opaque parts of a door or a door set.
- (7) Total area of skylights must be no more than 1.2 m². The calculation or modelling methods must be used for designs where the total area of skylights is more than 1.2 m².
- (8) An R-value of 0.26 m² °C/W may be used for traditional leadlight glass when the total area of leadlight glass is no greater than 2.6 m² and either the schedule method or calculation method is used.
- (9) The R-values specified in Option 1b, 2b and 3b may only be used in the schedule method, i.e. shall not be used in the calculation or modelling methods.
- (10) When using R-values for either Options a or b, all R-values for that option shall be used, i.e. roof, wall, floor and glazing. The R-values for a single building component shall not be substituted from one option to another.
- (11) Table 2(b) allows buildings of solid construction to have lower R-values than buildings of non-solid construction, due to the benefits of appropriate use of thermal mass. Thermal mass must be used in conjunction with good passive design to increase comfort and reduce energy use. Use of the R-values in table 2(b) requires that the thermal mass is accessible, i.e. inside the insulated building envelope. If additional bulk insulation material is required to achieve the R-values in this table, this insulation must be installed on the outside of the wall.

**Replacement
Table 3:**

Heated walls, ceilings or floors – minimum R-values for the schedule method

Building thermal envelope component	Minimum values for climate zones 1, 2 and 3 (m ² °C/W)
Heated ceiling (R _{OUT})	R 3.5
Heated wall (R _{OUT})	R 2.6
Heated floor (R _{OUT})	R 1.9

where

$$R_{IN}/R_{OUT} < 0.1$$

and

R_{IN} is the *thermal resistance* between the heated plane and the inside air

R_{OUT} is the *thermal resistance* between the heated plane and the outside air.

NOTE:

Carpets or floor coverings are not included in the floor *R-value*. Floor coverings, e.g. carpet or cork, will reduce the efficiency of the heated floor.

**Replacement
Table 4:**

Reference building – area of glazing R-values

Building thermal envelope component	Minimum R-values (m ² °C/W)		
	Climate zone 1	Climate zone 2	Climate zone 3
Area of vertical glazing up to 30% of total wall area	0.26	0.26	0.26
The proportion of the area of vertical glazing over 30% of total wall area	0.26	0.31	0.34
Glazing – skylights	0.31	0.31	0.34

NOTE:

- (1) See Appendix G (of NZS 4218) for options to achieve the window R-values in this table. The R-values in Appendix G (of NZS 4218) shall be accepted, except where a higher R-value can be demonstrated by calculation or measurement using NZS 4214 or an internationally accepted computer software program.
- (2) An R-value of 0.26 m² °C/W may be used for traditional leadlight glass when the total area of leadlight glass is no greater than 2.6 m² and either the schedule method or calculation method is used.
- (3) Total area of glazing over 50% of total wall area may cause excessive heat gain and/or heat loss, and the modelling method shall be used in these cases.
- (4) Non-glazed areas of door openings greater than 3 m² are treated as wall.
- (5) This table 4 applies to both solid and non-solid construction.