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Safari Group

### **Tenancy Act – Heating Standard**

Based on the results from the heating calculator on the government web site the smaller units with living space of 25m<sup>2</sup> or less the requirement is 3.3kw of heating with the larger units with a living space of 25m<sup>2</sup> to 30m<sup>2</sup> the requirement is 3.8kw of heating.

Current we install Daikin inverter heat pumps these have the following ratings.

- 25m<sup>2</sup> or less – required 3.3kw
- Installed Daikin 3.5kw heat pump which has a rated output of 4.0kw of heating, with a max output of 5.5kw
  
- 25m<sup>2</sup> to 30m<sup>2</sup> – required 3.8kw
- Installed Daikin 4.6kw heat pump which has a rated output of 5.4kw of heating, with a max output of 6.7kw

All heat pumps installed in the following residential units meet the standards as required in the Tenancy Act:

Ramada Albany  
Ramada Manukau  
Ramada Victoria  
Ramada Remarkables  
Wyndham Garden Queenstown  
Ramada Wellington  
Ramada Newmarket

Yours faithfully

Mark Alexander  
Director



# Energy Efficiency Report

**Revision**                    **A**  
**Project Number**       **4249**  
**Project Name**           **770 Great South Road Apartments**  
                                  **Manukau**  
                                  **Auckland 2104**

**Author:**

Finn Roy, 22 Degrees Ltd

## **1.0 Method of compliance AS1/H1**

The method of compliance is NZS 4218:2004 Small Buildings and AS1/H1

## **2.0 Scope of report**

This report has been generated to show compliance with section H1 – Energy Efficiency of the New Zealand Building Code. This is done so by providing a calculated comparison for the energy use of the building between occupied and unoccupied spaces.

The proposed building has a window to wall ratio of 29%

Any construction must be no less than 60% of the reference construction requirements within the building code clause H1 table 1 and must be greater than that listed in E3.

For the building to comply the notional heat loss from the reference building has to be higher than or equal to the proposed. i.e.

$$HL_{reference} > HL_{proposed}$$

### 3.0 Description of the building

The development on Great South Road, Manukau consists of a new 8 storey building. Levels 4-8 are all primarily reserved for apartment rooms with the remaining space providing for a stairwell and a lift shaft. Half of level 3 is occupied by apartments. The remaining area of the building is accounted for in a separate report.

### 4.0 Calculation method Requirements

The minimum R values for the new construction areas are based on Table 1 of section H1 of the Building Code which replaces Table 1 of NZS 4218:2004, climate Zone 1. For the reference building the glazed areas are set to 30% of the total wall area. Below is a list of insulation and resistance values which are to be used.

Proposed insulation to be installed:

- Steel Framed Roof R 3.60
- Clad Wall R 2.20
- Internal Wall R 1.80
- Concrete Wall R 1.30

Proposed calculated resistance values:

- Steel Framed Roof R 2.95
- Clad Wall R 2.41
- Internal Wall R 1.51
- Concrete Wall R 1.46
- Joinery R 0.17      Single glazed, Aluminium framed  
R 0.31      Double glazed, Aluminium framed

Reference resistance values:

- Roof R 2.90
- Walls R 1.90
- Glass R 0.26

Refer to the attached calculations based on NZS 4214:2006 Methods of determining the total thermal resistance of parts of buildings.

## 5.0 Conclusion

It has been found that in order to gain compliance a minimum of 925.0m<sup>2</sup> of the joinery must be double glazed.

The proposed building will exceed the requirements of the building code if the minimum recommendations listed are provided. Insulation installation to meet NZS 4246: 2006 Installing Insulation in Residential Buildings and BRANZ approved documents.



Finn Roy  
BE(Hons) Mechanical  
For

**22 Degrees Ltd**

Encl	Appendix 1 – Area Take off,	1 page
	Appendix 2 – Heat loss,	1 page
	Appendix 3 – R Value Calculations,	2 pages

**4249 - 770 Great South Road Apartments  
Area Take Off**



	<b>Building construction</b>	<b>Area</b>
<b>North Face</b>	Total	<b>458.50</b>
	Glass	<b>216.60</b>
	Clad Wall	<b>87.70</b>
	Internal Wall	<b>125.40</b>
	Concrete Wall	<b>28.80</b>
<b>South Face</b>	Total	<b>432.60</b>
	Glass	<b>154.80</b>
	Clad Wall	<b>153.40</b>
	Internal Wall	<b>90.20</b>
	Concrete Wall	<b>34.20</b>
<b>East Face</b>	Total	<b>1613.40</b>
	Glass	<b>446.10</b>
	Clad Wall	<b>456.20</b>
	Internal Wall	<b>617.30</b>
	Concrete Wall	<b>93.80</b>
<b>West Face</b>	Total	<b>1618.10</b>
	Glass	<b>387.00</b>
	Clad Wall	<b>451.00</b>
	Internal Wall	<b>780.10</b>
	Concrete Wall	<b>0.00</b>
Total Glazing area		<b>1205 m<sup>2</sup></b>
Total Wall area		<b>4123 m<sup>2</sup></b>
Window to Wall Ratio		<b>29%</b>

**4249 - 770 Great South Road Apartments**  
**Heat Loss Comparison**



**Heat Loss Proposed**

Construction	Area m <sup>2</sup>	Proposed R Value	Heat Loss (m <sup>2</sup> /m <sup>2</sup> K/W)
Steel Framed Roof	799.0	2.95	271 W/K
Clad Wall	1148.3	2.41	476 W/K
Internal Wall	1613.0	1.51	1068 W/K
Concrete Wall	156.8	1.46	107 W/K
Single Glazing	279.5	0.17	1644 W/K
Double Glazing	925.0	0.31	2984 W/K

$$HL_P = (A_{Roof}/R_{Roof}) + (A_{Wall}/R_{wall}) + (A_{Glazing}/R_{Glazing}) + (A_{Floor}/R_{Floor})$$

<b>HL<sub>Proposed</sub> =</b>	<b>6551 W/K</b>
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**Heat Loss Reference**

Construction	Area m <sup>2</sup>	Reference R Value	Heat Loss (m <sup>2</sup> /m <sup>2</sup> K/W)
Roof	799.0	2.90	276 W/K
Wall	2885.8	1.90	1519 W/K
Glazing	1236.8	0.26	4757 W/K

$$HL_R = (A_{Roof}/R_{Roof}) + (A_{Wall}/R_{wall}) + (A_{Glazing}/R_{Glazing}) + (A_{Floor}/R_{Floor})$$

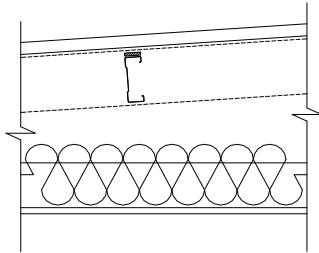
<b>HL<sub>Reference</sub> =</b>	<b>6551 W/K</b>
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Heat Loss Proposed ≤ Heat Loss Reference

**Roof Constructions**

**Steel framed roof**

10mm EPS thermal brack between steel purlin and cladding



Trusses @ 1200  $\phi$   
7.5% Bridging

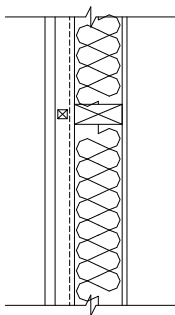
Bridging		Un Bridged		Overall	
				$R_{out}$	0.030
				$R_{c/s}$	-
$R_{TBrack}$	0.240				
$R_{purlin}$	0.243	$R_{air}$	0.160		
$R_{air}$	0.160	$R_{insu}$	3.600	$R_{bridge}$	2.758
				$R_{gib}$	0.040
				$R_{in}$	0.120

$R_T$  2.948 m<sup>2</sup>K/W

**Wall Constructions**

**Timber framed Clad wall**

Over cavity



Studs @ 600  $\phi$   
Noggs @ 800  $\phi$   
14% Bridging

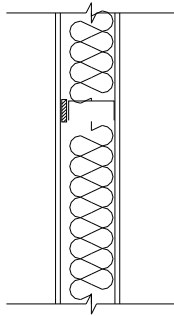
Bridging		Un Bridged		Overall	
				$R_{out}$	0.030
				$R_{ply}$	0.280
$R_{batten}$	0.180	$R_{air}$	0.120		
$R_{stud}$	0.780	$R_{ins}$	2.200	$R_{bridge}$	1.936
				$R_{gib}$	0.040
				$R_{in}$	0.120

$R_T$  2.406 m<sup>2</sup>K/W

**Wall Constructions**

**Steel framed wall GIB lined**

Used between occupied and un occupied spaces  
10mm thermal brack between steel stud and cladding



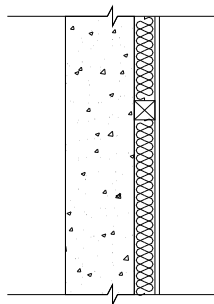
Studs @ 600  $\Phi$   
Noggs @ 800  $\Phi$   
14% Bridging

Bridging		Un Bridged		Overall	
				$R_{out}$	0.120
				$R_{gib}$	0.040
$R_{TBrack}$	0.240	$R_{air}$	0.120		
$R_{stud}$	0.116	$R_{ins}$	1.800	$R_{bridge}$	1.189
				$R_{gib}$	0.040
				$R_{in}$	0.120

$R_T$	<u>1.509 m<sup>2</sup>K/W</u>
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**Proposed pre-cast concrete wall**

Thickness 250 mm



Strapping @ 800  $\Phi$   
7% Bridging

Bridging		Un Bridged		Overall	
				$R_{out}$	0.030
				$R_{pcp}$	0.156
$R_{timb}$	0.390	$R_{ins}$	1.300	$R_{bridge}$	1.117
				$R_{gib}$	0.040
				$R_{in}$	0.120

$R_T$	<u>1.464 m<sup>2</sup>K/W</u>
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