



EMERGEN

THERMAL PERFORMANCE REVIEW

Multi-Unit Development

55 Milton Street, Mount Hawthorn

PREPARED BY

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The contents of this report have been based of the documentation and plans provided by the Client to Emergen, as part of CADDs Group.

It is the responsibility of the building designer and the builder to ensure that the specifications provided in this documentation are adhered to.



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1 INTRODUCTION

This report contains the results of a thermal review of the proposed 9 residential apartments at 55 Milton Street, Mount Hawthorn. The purpose of the report is to identify solutions to meet the NCC Section J Energy provisions.

Table 1 – Compliance Overview

Building	Class	Verification
9 x Sole Occupancy Units	2	NatHERS

2 SCOPE OF WORKS

2.1 Performance Requirements

The assessment has been conducted is in compliance with JV protocol as specified in the NCC 2019 Amendment 1. The required targets are outlined in part J0.2 heating and cooling loads of sole-occupancy units of a class 2 building and state in conjunction with Design WA:

1. for reducing the heating and cooling loads-
 - a. collectively achieve an average energy rating of not less than **6.5 stars**; and
 - b. individually achieve an energy rating of not less than **5.5 stars**,
 - c. using a calculation method that complies with the ABCB Protocol for House Energy Rating Software;

2.2 Thermal Calculation Method

The thermal calculation method for the development has been carried out in accordance with ABCB House Energy Rating Protocols using First Rate 5 v (5.3.2b) NatHERS Accredited Software.

Refer to Appendix 1 for details on the NatHERS thermal calculation method.



3 THERMAL REVIEW

The results of the thermal analysis are outlined in table 2 below. The table highlights the heating and cooling loads for each apartment, associated star rating and recommended upgrades

3.1 Model Results

Table 2 Thermal Overview

Apartment Type	Cooling (MJ/m2)	Heating (MJ/m2)	Total (MJ/m2)	Star Rating	Upgrades to achieve target
G01	12.7	37	49.7	7.1	
101	26.1	42.1	68.2	6.1	Cavity Infill
102	30.8	34	64.8	6.3	
103	27.2	24.1	51.3	7.0	
104	29.6	44.3	73.9	5.8	Cavity Infill + Low E Clear to Sliding Door
201	32.4	38.9	71.3	5.9	Cavity Infill
202	27.7	27.1	54.8	6.8	Cavity Infill
203	24.9	23.8	48.7	7.2	Cavity Infill
204	25.1	33.3	58.4	6.6	Cavity Infill
Average Star Rating: 6.5 Stars					

4 SPECIFICATION

The below specification has been applied to the building.

Table 3 – BCA compliance specification

Building Construction Materials		
External Walls	Construction	230mm Brick Cavity Wall
	Insulation	No Insulation
	Construction	230mm Brick Cavity Wall
	Insulation	50mm Cavity Infill (R1.3)



Party wall	Construction	230mm Brick Cavity Wall
	Insulation	No Insulation
Internal Walls	Construction	90mm Single Brick Wall
	Insulation	No Insulation
Floors	Construction	Concrete Slab on Ground
	Insulation	No Insulation
	Construction	250mm Suspended Concrete Slab
	Insulation	50mm K10 soffit R2.35 Insulation (exposed floor) [Apt. 101 & 104]
	Covering	As per plans (Tiles to wet areas & Vinyl Planks to remaining)
Ceiling (upper floor)	Construction	Plasterboard Ceiling
	Insulation	R4.0 Ceiling Insulation
Roof	Construction	Metal Deck Roof / Concrete to Plant
	Insulation	Anticon 60 under Metal Roof

Table 4 – Glazing Specification

Glazing Specification		U-Value	SHGC
Sliding windows	Single glazing Clear in aluminium frame	6.60	0.74
Awning windows	Single glazing Clear in aluminium frame	6.57	0.63
Sliding door	Single glazing Clear in aluminium frame	6.12	0.70
	Single glazing Low E Clear in aluminium frame	4.37	0.59

The glazing values specified are for whole systems values (glass + frame).



4.1 Critical Items

As the design progresses Items that may impact CADDs recommendations and would require adjustment to the specification include

- Changes in Construction method/materials
- Adjustment to slab thickness
- Change of floor coverings
- Changes to glazing size and locations
- Changes to glazing operability
- Removal or changes in operability of external shading screens



APPENDIX 1 – NATHERS THERMAL CALCULATION

When calculating a star rating, NatHERS software models expected indoor temperatures based on data specific to that dwelling. The software will then model how much cooling or heating occupants may need to stay comfortable during a typical year.

For the purpose of assessing a building under NatHERS, the software allocates functions to each space, along with a period of time during which the space is likely to be used and required to be kept at a comfortable thermal range.

Emergen has identified the assumptions the software uses to model the thermal performance of the building.

Table 4 – Zone Assumptions

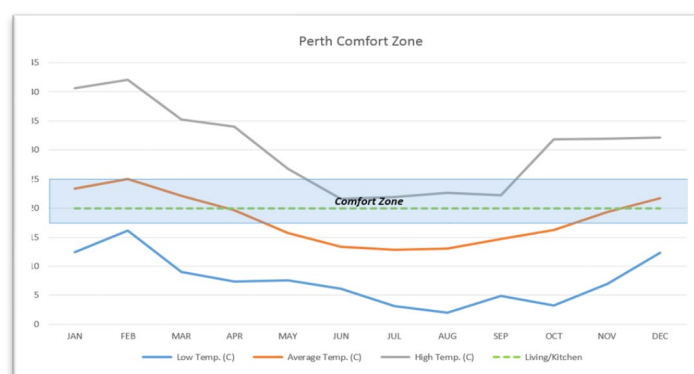
Zone type	Assumptions	Cooling (° Celsius)	Heating (° Celsius)	Comments
Living	Conditioned from 0700 - 2400. Daytime occupancy	25	20	No cooking heat gains.
Bedroom	Conditioned from 2400 - 700		15	Night-time occupancy.
	Conditioned from 700 - 900 and from 1600 to 2400	25	18	
Living/Kitchen	Conditioned from 0700 - 2400. Daytime occupancy.	25	20	Cooking heat gains included.

The project is located in BCA Climate Zone 5 (warm temperate climate), NatHERS Climate Zone 52.

General Overview:

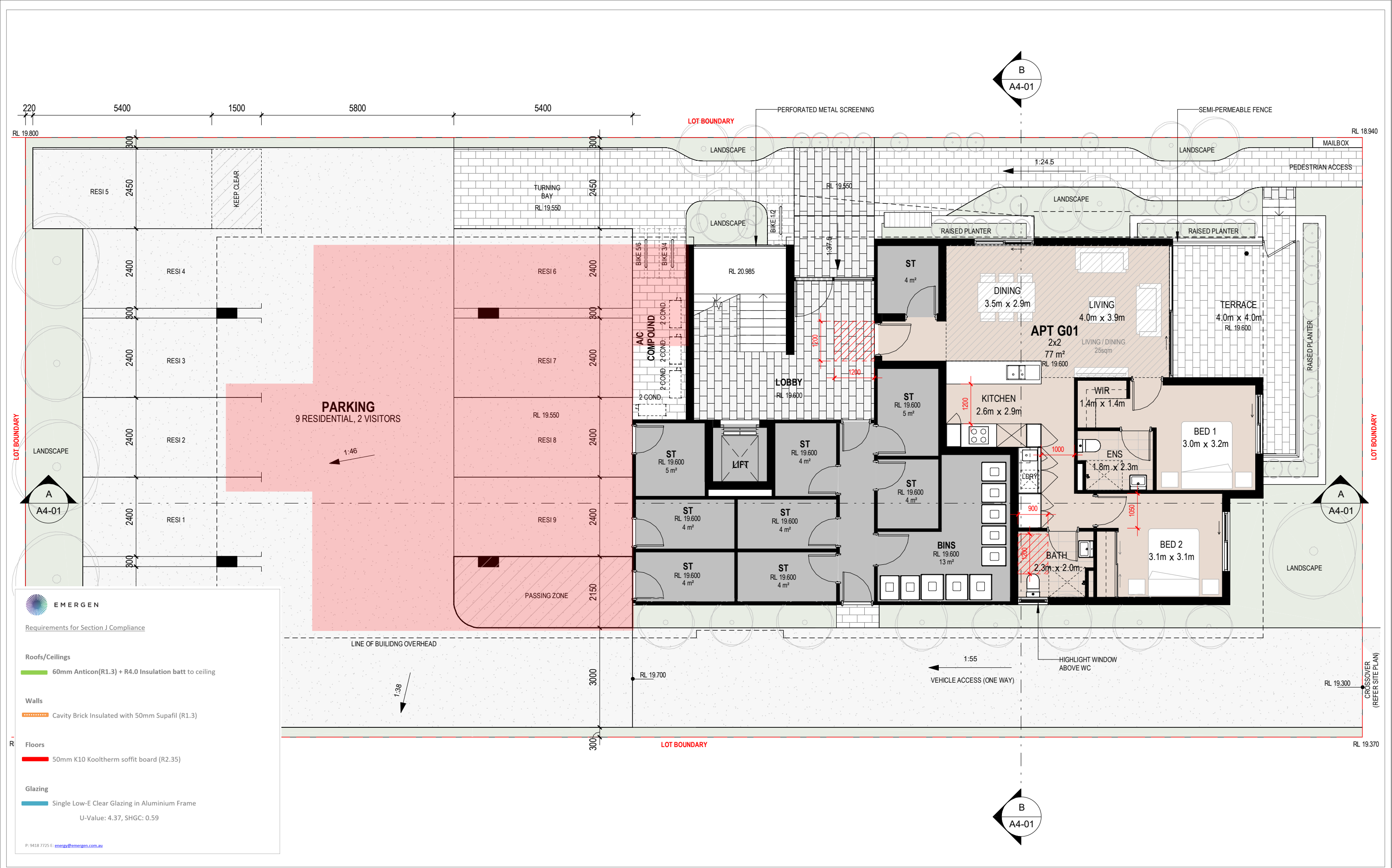
- 50% of the time require heating, 25% of the time is within comfortable conditions and 25% of the time require cooling.
- Moderate diurnal (day–night) temperature range near coast to high diurnal range inland.

Figure 1 – Perth climate overview

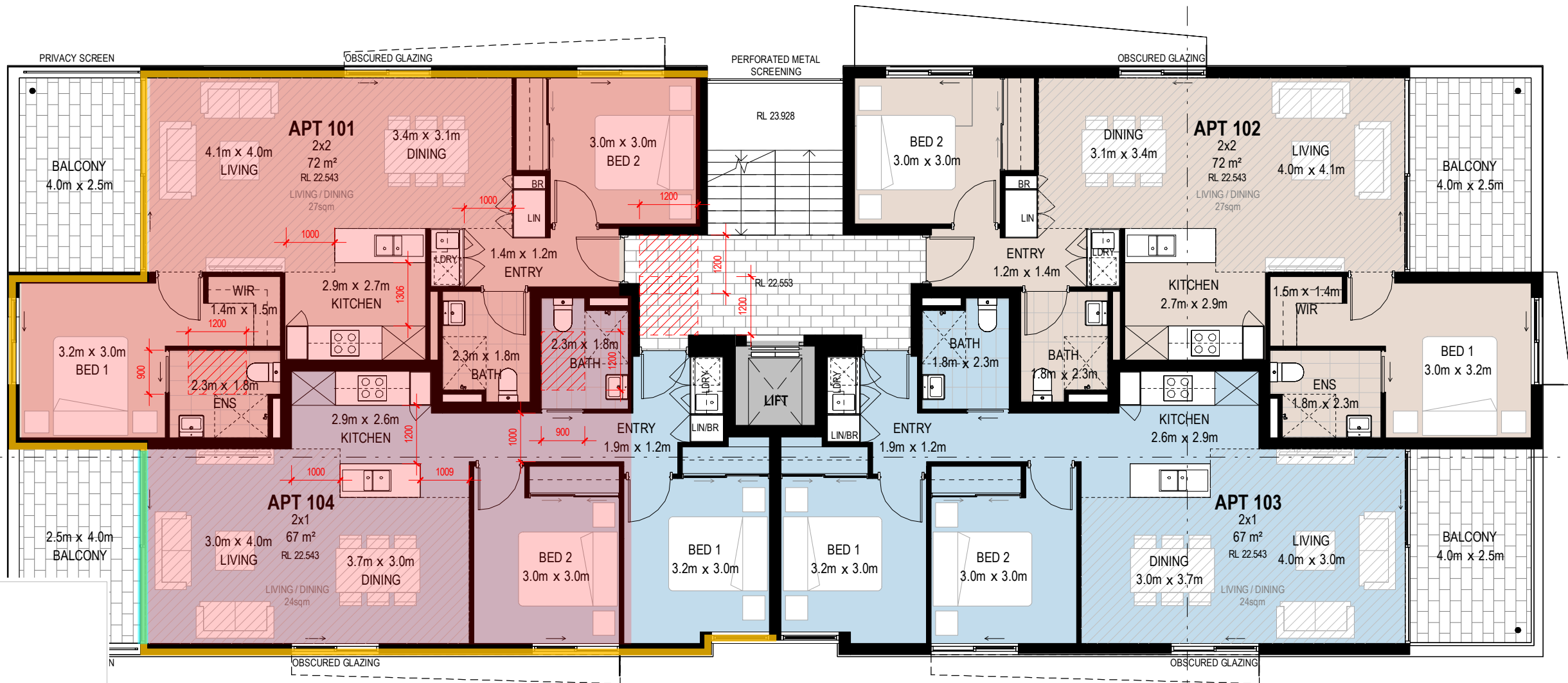


APPENDIX 2 – MARKED UP PLANS BCA COMPLAINT





PROJECT NAME SOCIAL HOUSING 55 MILTON STREET, MOUNT HAWTHORN		DRAWING NAME GROUND FLOOR PLAN		SCALE 1 : 100 (A3) 0 1 2 3 4 5 6 M		07.10.2022 H ISSUE FOR DA
						05.10.2022 G ISSUE FOR DA
						14.09.2022 F COORDINATION ISSUE
						15.08.2022 E ISSUE FOR REVIEW
CLIENT DEPARTMENT OF COMMUNITIES		DEVELOPMENT APPROVAL		PROJECT No. 21.17	DRAWING No. A2-01	REV H
				DRAWN BY	AB	29.04.2022 D ISSUE FOR REVIEW
						27.04.2022 C PRELIMINARY ISSUE
						26.04.2022 B PRELIMINARY ISSUE
				DD/MM/YY	REV	DESCRIPTION
						CHECKED



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Requirements for Section J Compliance

Roofs/Ceilings

60mm Anticon(R1.3) + R4.0 Insulation batt to ceiling

Walls

Cavity Brick Insulated with 50mm Supafil (R1.3)

Floors

50mm K10 Kooltherm soffit board (R2.35)

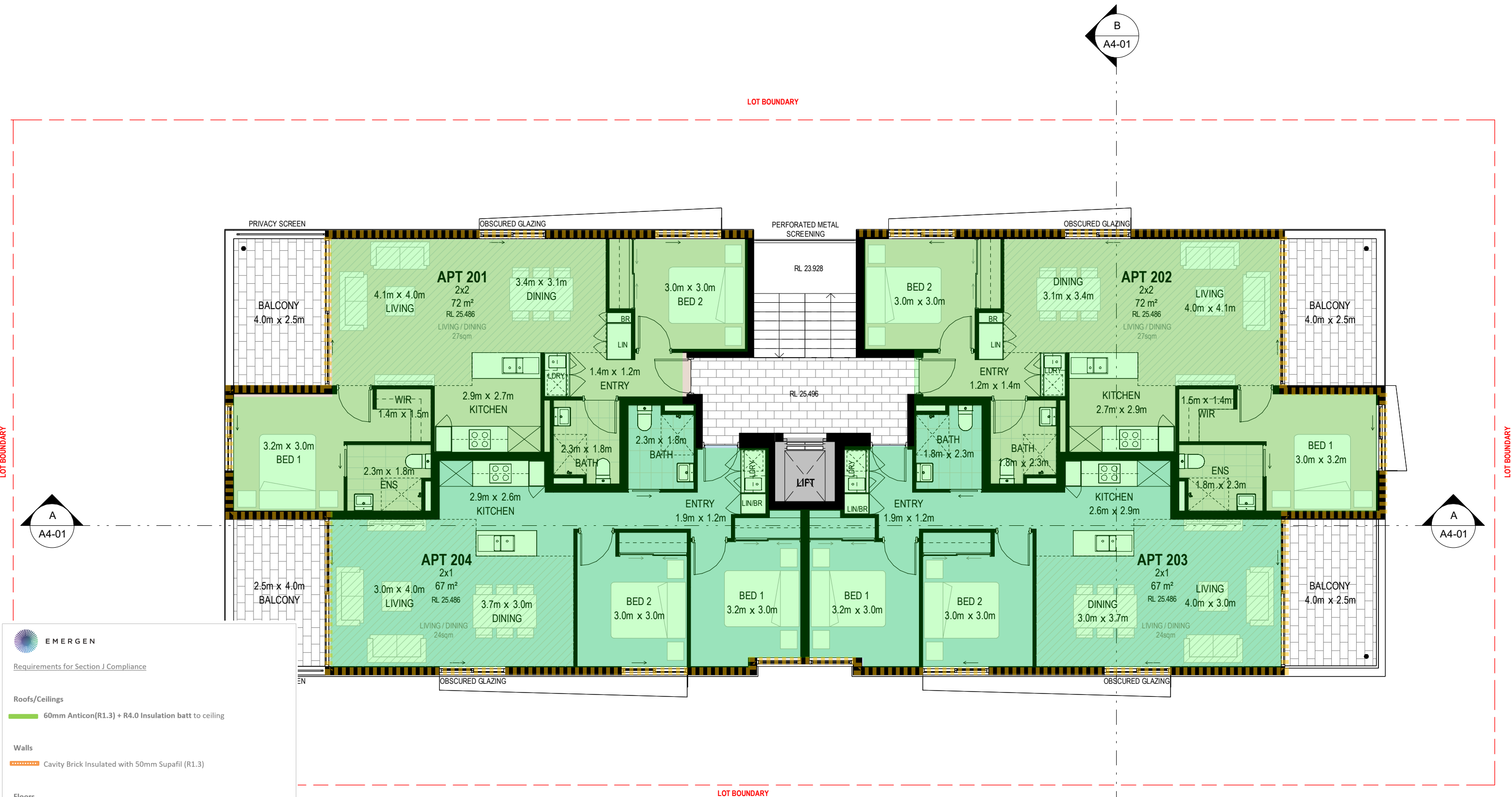
Glazing

Single Low-E Clear Glazing in Aluminium Frame

U-Value: 4.37, SHGC: 0.59

P: 9418 7725 E: energy@emergen.com.au

	PROJECT NAME	DRAWING NAME	SCALE				07.10.2022	I	ISSUE FOR DA	
	SOCIAL HOUSING	LEVEL 1 FLOOR PLAN	1 : 100 (A3)				05.10.2022	H	ISSUE FOR DA	
	55 MILTON STREET, MOUNT HAWTHORN						14.09.2022	G	COORDINATION ISSUE	
CLIENT			PROJECT No.	DRAWING No.	REV	15.08.2022	F	ISSUE FOR REVIEW		
DEPARTMENT OF COMMUNITIES	DEVELOPMENT APPROVAL		21.17	A2-02	I	29.04.2022	E	ISSUE FOR REVIEW		
						27.04.2022	D	PRELIMINARY ISSUE		
						26.04.2022	C	PRELIMINARY ISSUE		
			DRAWN BY			AB	DD/MM/YY	REV	DESCRIPTION	



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Requirements for Section J Compliance

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Floors

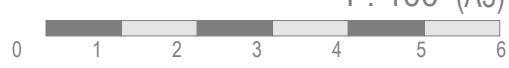
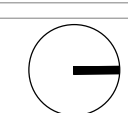
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	55 MILTON STREET, MOUNT HAWTHORN	LEVEL 2 FLOOR PLAN	PROJECT No.	DRAWING No.						
	CLIENT	DEPARTMENT OF COMMUNITIES	21.17	A2-03						
		DEVELOPMENT APPROVAL								
			DRAWN BY	AB			DD/MM/YY	REV	DESCRIPTION	CHECKED