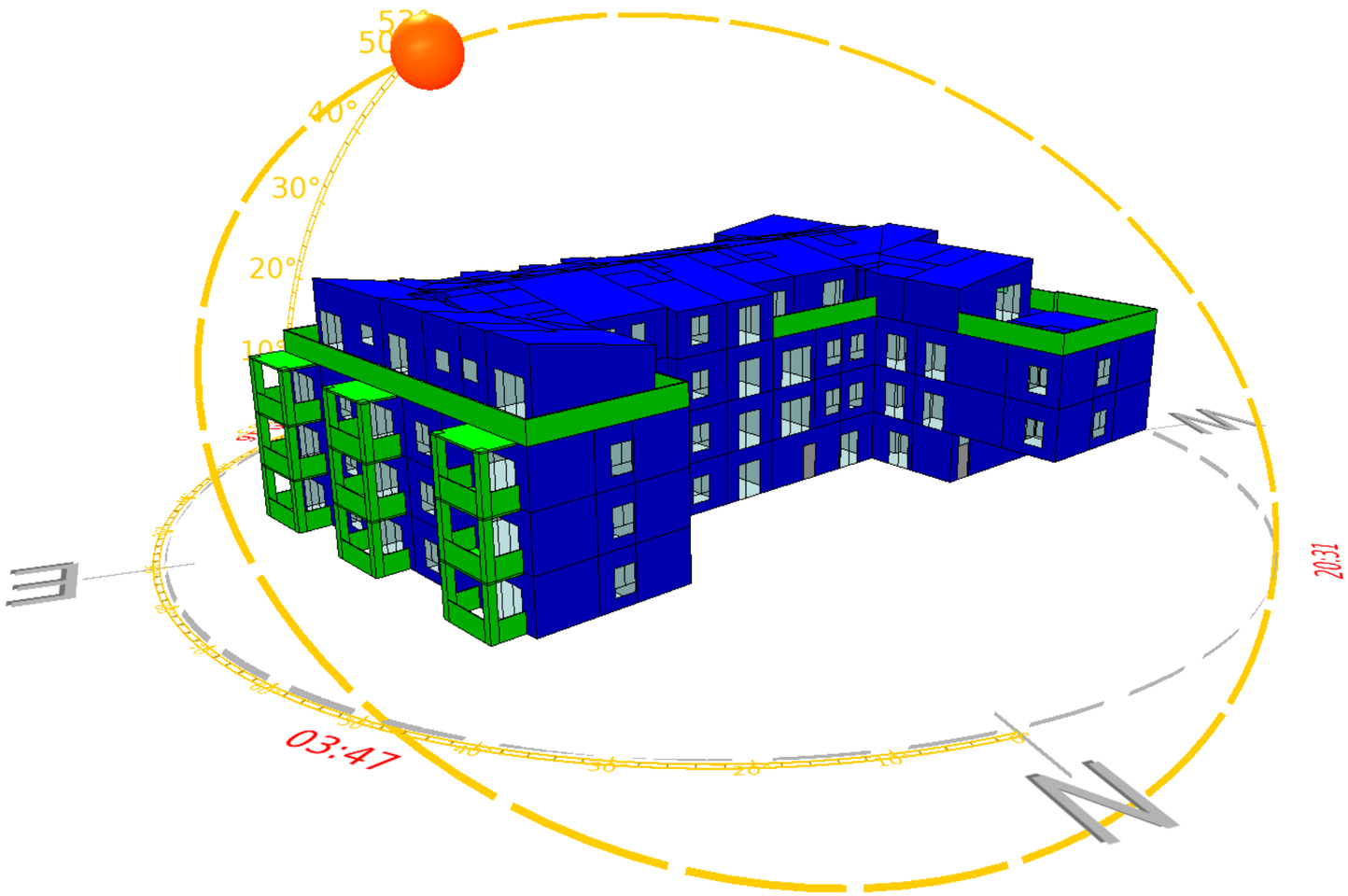
PB SUSTAINABILITY
SUSTAINABILITY / ENERGY / COMPLIANCE

The Old School
Wallasey
Wirral
CH44 5TN

Albany Road, Chorlton

CIBSE TM59 Overheating Analysis

In accordance with Part O



elmhurstenergy APPROVED ENERGY ASSESSOR
QUALITY PROMISE
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ABBE Quality Accredited

OVERHEATING REPORT OF ALBANY ROAD, CHORLTON
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Appendix A - Detailed Overheating Results – 1 Beds
Appendix B - Detailed Overheating Results – 2 Beds

Prepared by:	Signature	Date
Daniel Willis	DW	11.07.24

Revision Record			
Rev	**Date**	**By**	**Summary of Changes**
01	11.07.24	DW	

1 EXECUTIVE SUMMARY

This report presents an analytical study of the overheating outcomes for the proposed apartments at the site of Albany Road, Chorlton, assessing the development for risks of overheating. The modelling exercise uses design information and relevant industry standards. The results are based on the dynamic modelling outputs from the IES VE software.

The overheating assessment has been carried out with the guidance set out in CIBSE TM59: *Design Methodology for the Assessment of Overheating in Homes* in accordance with Approved Document Part O. The methodology aims to produce a test that encourages good design that is comfortable within sensible limits while prioritising passive measures to achieving compliance against the overheating assessment criteria.

The apartment have been assessed against the DSY1 weather file to determine the likelihood of overheating to occur, with the proposed building created in the IES VE software modelled to a high level of detail and accuracy to stress-test the proposed overheating strategy.

Mechanical ventilation by MVHR (Mechanical Ventilation Heat Recovery) also forms the overheating strategy, which has been modelled to meet the *Approved Document F* minimum requirements for a whole house ventilation system (known as system 4).

Assessment findings

The assessment found all assessed spaces in the proposed apartments are able to meet the TM59 overheating criteria and therefore achieve Part O compliance with the building design described in this report. A summary of measures that form the overheating mitigating strategy include:

- Natural ventilation via window openings to the apartments where there are no noise issues.
- Window openings to be opened to maximal permissible opening angles in accordance with Approved Document K (safeguarding measures required).
- Glazing solar performance (g value) of 0.30.
- Internal doors to be left open when possible.
- MVHR (system 4) providing whole house continuous mechanical ventilation using flow rates stated in section 7.4 of this report.

The summary results table below details the overheating assessment findings of the assessed dwelling:

#	House Type	Dwelling Description	Overheating	TM59/Part O Compliance	Notes	Results
1	1 Bed	1 bed, 2 person apartment	Natural Ventilation where possible + g value 0.30 + MVHR	☑	Passive overheating strategy sufficient	Appendix A
2	2 Bed	2 bed, 3 person apartment		☑	Passive overheating strategy sufficient	Appendix B

2 INTRODUCTION

This report reviews the overheating risk assessment carried out for the proposed residential building, using dynamic simulation modelling following the guidance detailed in CIBSE TM59 Design methodology for the assessment of overheating risk in homes (2017).

An analytical study is presented within this report of the potential overheating risks of the residential spaces. The scope of this study is to report upon the likely overheating risk and to assess the periods of the year that the building has the potential to overheat using current CIBSE weather file data, and to present a working solution to any and all spaces within the assessed apartments.

The intention is that this study helps inform and verify the design proposals, thereby providing the basis for mitigating overheating risk and producing a building that provides comfortable environmental conditions for occupants.

It is important to note that with any modelling exercise there are assumptions and approximations that have to be made. As far as possible, details of all assumptions and approximations are supplied within the report. These were predominantly informed by information provided by the design team and should be reviewed carefully.

All results are based on the output from computer modelling software and should be taken as an indication of the likely final situation, but these conditions cannot be guaranteed.

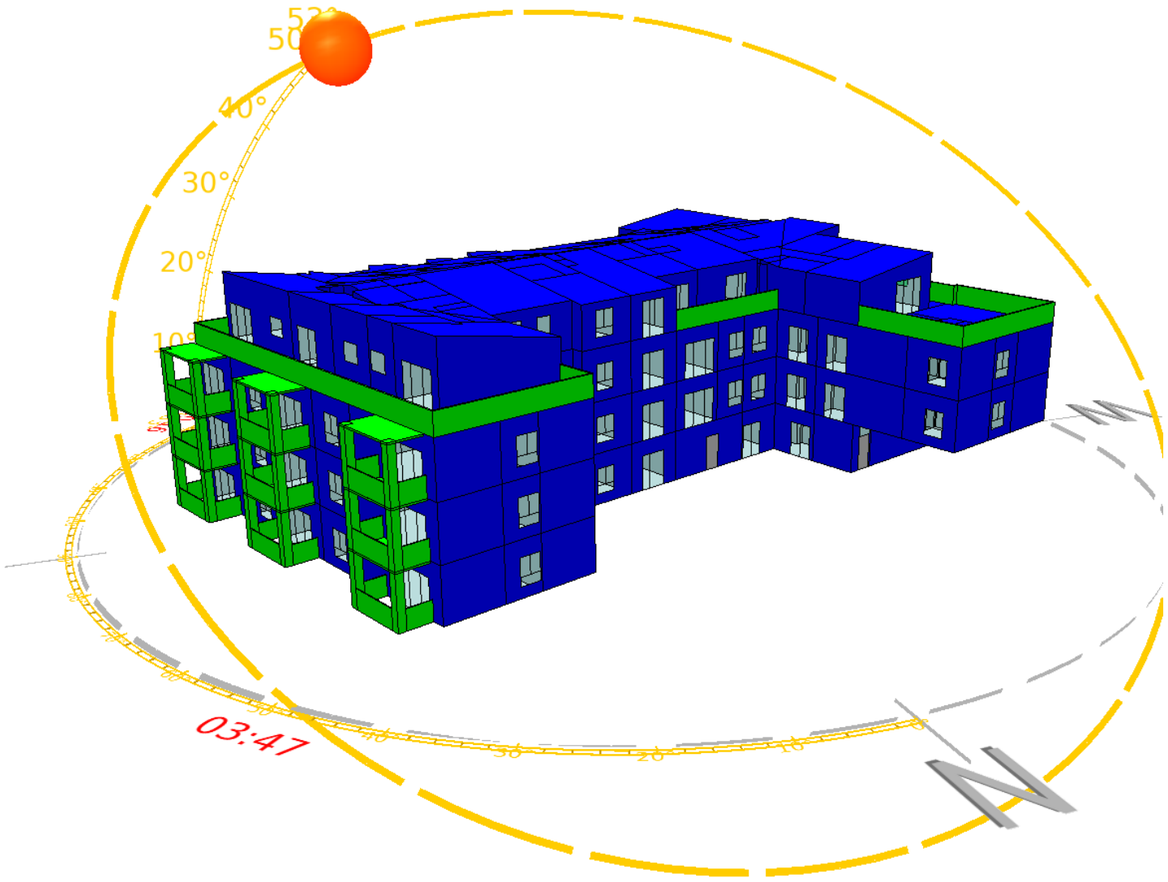


Figure 1: 3D view of the proposed development

Moreover, this Overheating Assessment supports the Planning Application and demonstrate that the proposed development complies with the relevant current guidance CIBSE TM59: Design Methodology for the Assessment of Overheating Risk in Homes (2017) and the requirements of the Dynamic Simulation of the building regulation in England setting standards for overheating in new residential buildings: Overheating: Approved Part O.

3 Overheating Assessment Criteria

TM59 sets different overheating compliance criteria for homes that are predominantly naturally ventilated and for homes that are predominantly mechanically ventilated.

For homes that are predominantly naturally ventilated, the method with two criteria should be used to assess overheating. The first overheating criteria, which applies to both living rooms/kitchens and bedrooms, is an adaptive criteria. The second overheating criterion is a fixed temperature criteria which applies only to bedrooms. Both criteria must be met for all spaces within a home to demonstrate compliance.

For mechanically ventilated homes, the fixed temperature method with a single criterion should be used to assess overheating. This single criterion must be met for all spaces (living rooms/kitchens and bedrooms) within a mechanically ventilated home to demonstrate compliance.

The TM59 criteria for naturally and mechanically ventilated homes are summarised in the following table. The apartments in this assessment are assessed against both the 'naturally and mechanically ventilated' criteria.

All criteria must be met for all spaces within a home to demonstrate full compliance.

Assessment Type	Assessment Criteria	Applicable Rooms	Occupied Hours	Naturally Ventilated Homes (open windows)	Mechanically Ventilated Homes (closed windows)
Predominantly Natural Ventilation	Criterion 1	Living rooms, kitchens and bedrooms	Living / Kitchen / Dining rooms – 9am to 10pm (13 hours/day) Bedrooms – 24-hour occupancy	The number of hours during which external and internal temperature difference is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3% of occupied hours.	Not Applicable
	Criterion 2	Bedrooms only	Bedrooms – 24-hour occupancy	The operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26 °C for more than 1% of annual hours. 33 or more hours above 26˚C will be a fail	Not Applicable
Predominantly Mechanical Ventilation	Criterion 3	Living rooms, kitchens and bedrooms	Living / Kitchen / Dining rooms – 9am to 10pm (13 hours/day) Bedrooms – 24-hour occupancy	Not applicable	The operative temperature in occupied all occupied rooms should not exceed 26˚C for more than 3% of the annual occupied annual hours. 143 or more hours above 26˚C for living rooms and kitchens will be a fail. 263 or more hours above 26 ˚C for bedrooms will be a fail

4 Design Criteria

The following general criteria have been used throughout the simulation:-

4.1 Air permeability

An air infiltration rate of 0.20ACH has been applied to the apartments based on Table 4.24 of CIBSE Guide A.

4.2 External Envelope

The following U-values have been based on the U Values provided by *the design team and Part L1A notional building figures*:-

Element	Proposed U-value (W/m^2K)	Part L1A U-value (W/m^2K)
External Walls	**0.18**	**0.18**
Exposed floor	**0.11**	**0.13**
Roof	**0.11**	**0.11**
Glazing	**1.20**	**1.40**
Doors	**1.20**	**1.20**

Building envelope U-values

4.3 Glazing Specification

The glazing is based on a G-value of 0.30.

4.4 Internal window blinds

Internal blinds have been not included in the calculations.

4.5 Weather

Weather file used in the calculation:- **Manchester_DSY1_2020High50_.epw.** The peak summer temperature is 30.0°C as shown in figure 2.

4.6 Site & Orientation

The proposed building has been modelled in the orientation as depicted in figure 3.

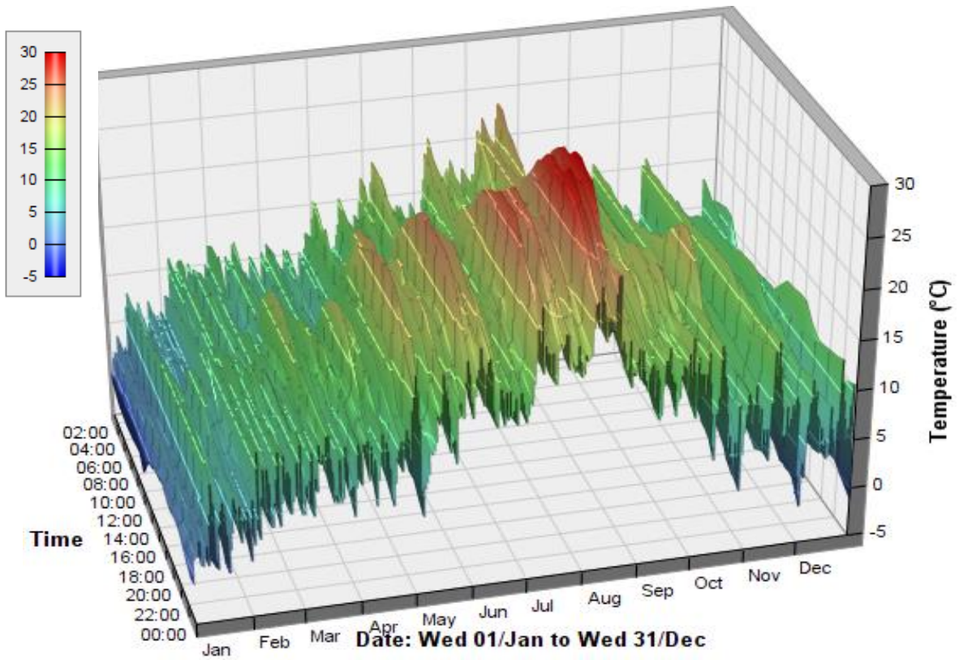


Figure 2: Annual dry-bulb temperature graph of modelled weather file

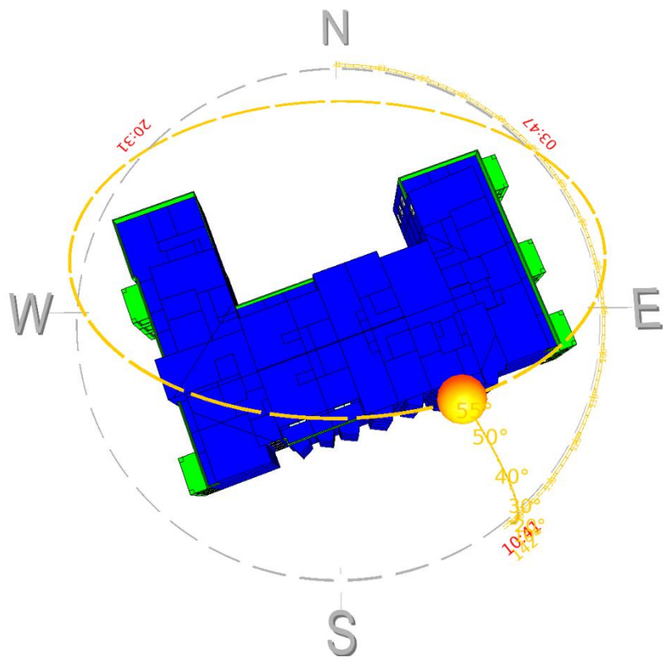


Figure 3: Site orientation of the proposed building

5 REFERENCE DATA

Architectural Drawings (WDW Architecture)

Plans & Elevations
2210-P-02F Site Layout/Ground Floor Plan – Level 1
2210-P-03E First Floor Plan – Level 2
2210-P-04E Second Floor Plan – Level 3
2210-P-05E Third Floor Plan – Level 4
2210-P-07D Proposed Elevations 1 of 2
2210-P-10A Proposed Elevations 2 of 2

Site Plan
2210-P-01H Site Layout - Appraisal



Figure 4: Architectural drawings – Ground Floor Plan



Figure 5: Architectural drawings – First Floor Plan

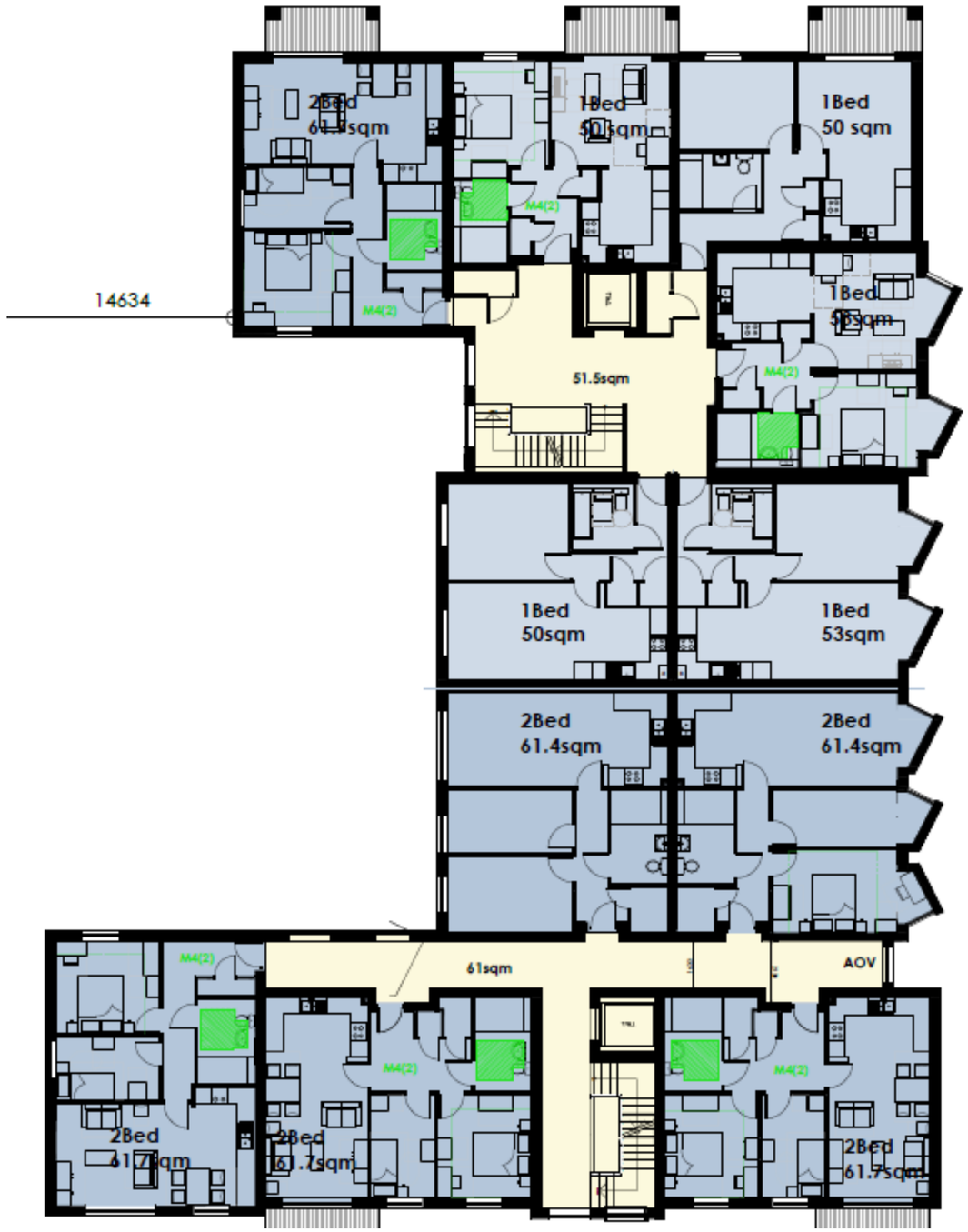


Figure 6: Architectural drawings – Second Floor Plan

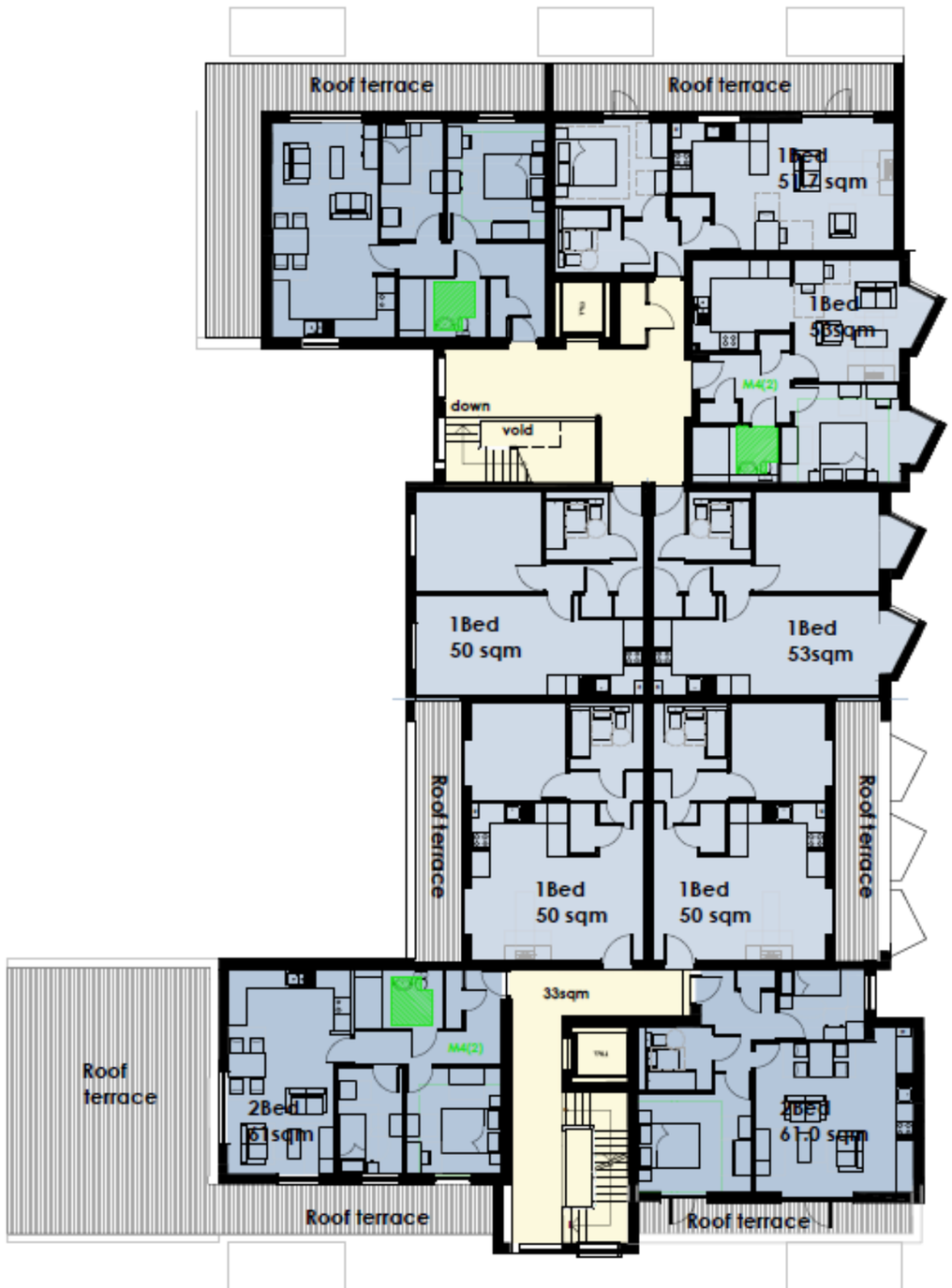


Figure 7: Architectural drawings – Second Floor Plan



FRONT ELEVATION (Albany Road)



REAR ELEVATION (Rail line Side)



SIDE ELEVATION (courtyard)



SIDE ELEVATION

Figure 8: Architectural drawings – Elevations

6 Internal Gains

The internal gains used throughout the simulations are detailed below. No differences between weekdays and weekends are considered. Bedrooms are set with a 24 hour occupancy profile which means that one person is always considered in each bedroom during the daytime and two people in each double bedroom at night. Kitchen/living rooms are unoccupied during sleeping hours and occupied during the rest of the day. Occupied periods are totalled as 3672 hours per year for bedrooms (24/7 May to September) and 1989 hours for living areas (13 hours per day May to September).
See Appendix B for a detailed CIBSE TM59 internal gain schedule.

6.1 Occupancy

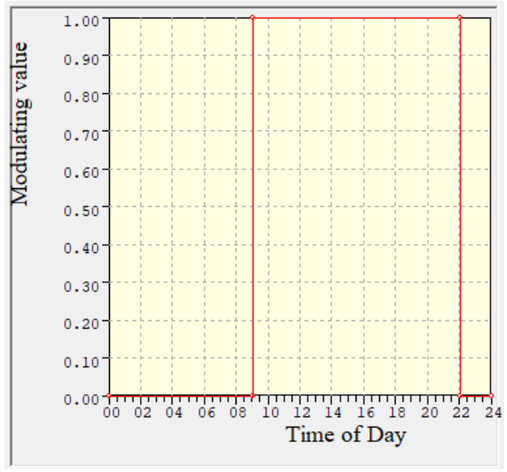
Based on CIBSE Guide A (2015a), a maximum sensible heat gain of 75W/person is assumed in the living spaces. An allowance for 30% reduced gain during sleeping is based on Addendum g to ANSI/ASHRAE Standard 55-2010.

Activity	Sensible heat gain per person (W)
Standard	75
Sleeping	52.5

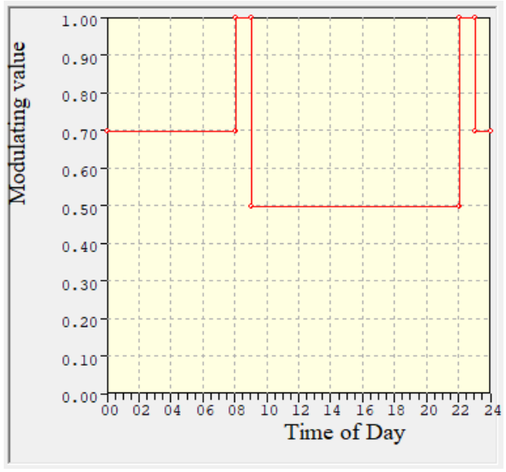
Occupant Gains

Unit/room type	Occupancy
1 bed living/kitchen	1 person from 9am to 10pm room is unoccupied for the rest of the day
2 bed living/kitchen	2 people from 9am to 10pm room is unoccupied for the rest of the day
3 bed living/kitchen	3 people from 9am to 10pm room is unoccupied for the rest of the day
Double bedroom	2 people at 70% gain from 11pm to 8am 2 people at full gain from 8am to 9am and from 10pm to 11pm 1 person at full gain from 9am to 10pm
Single bedroom	1 person at 70% gain from 11pm to 8am 1 person at full gain from 8am to 11pm

Occupancy



Typical living/kitchen occupancy profile



Typical double bedroom occupancy profile

6.2 LIGHTING

Lighting energy is assumed to be proportional to floor area. A default value of 2W/m² is applied to all occupied areas from 6pm to 11 pm.

Zone Type	Gain (W/m²)
living/kitchen/dining areas, bedrooms	2
	0

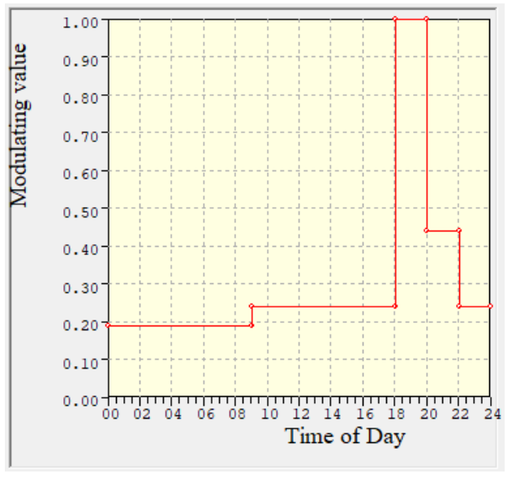
Lighting gains

6.3 EQUIPMENT

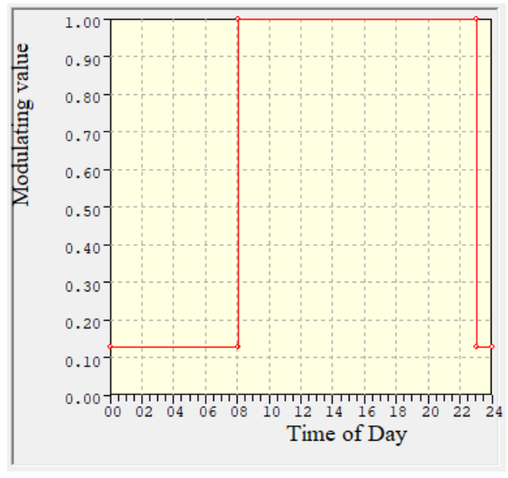
Equipment gains per room type are listed in the table below.

Unit/room type	Load
1 bed living/kitchen	Peak load of 450W from 6pm to 8pm 200W from 8pm to 10pm 110W from 9am to 6pm and 10pm to 12pm Base load of 85W for the rest of the day
2 bed living/kitchen	Peak load of 450W from 6pm to 8pm 200W from 8pm to 10pm 110W from 9am to 6pm and 10pm to 12pm Base load of 85W for the rest of the day
3 bed living/kitchen	Peak load of 450W from 6pm to 8pm 200W from 8pm to 10pm 110W from 9am to 6pm and 10pm to 12pm Base load of 85W for the rest of the day
Double bedroom	Peak load of 80W from 8am to 11pm Base load of 10W during sleeping hours
Single bedroom	Peak load of 80W from 8am to 11pm Base load of 10W during sleeping hours
Communal corridors	Assumed to be zero

Equipment gains



Typical living/kitchen equipment profile

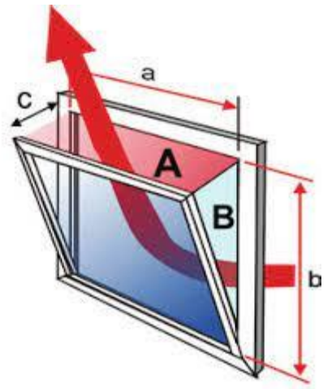


Typical double bedroom equipment profile

7 VENTILATION

7.1 NATURAL VENTILATION

The windows have been modelled using an opening profile that simulates the occupants within the rooms opening the windows when the internal air temperature reaches 22°C, as stipulated by *AD Part O*. The same procedure operates in reverse as the air temperature cools.



The free area is a way of measuring what the equivalent completely open area is for a glazing assembly. Sufficient free area to the opening windows in a dwelling is vital to the overheating mitigation strategy and can be calculated using the combined areas of A+B (in m^2).

Opening angle is the degree of opening of area **B**. Windows have been modelled to be either top or side hung as shown on the architectural drawings.
Dimension **c** refers to the opening length that windows reach when opened. As referenced in AD Part O section 3.9, if the maximum opening angle (**B**) exceeds 100mm of dimension length **c** then the following three criteria must be met:

a) *Window handles on windows that open outwards are not more than 650mm from the inside face of the wall when the window is at its maximum openable angle.*
b) *Guarding meets the minimum standards in Table 3.1*
c) *Guarding does not allow children to easily climb it. For example, horizontal bars should generally be avoided.*

See section 8 of this report for more information.



Figure 9: Airflow depiction of the building

7.2 INTERNAL DOORS

It is recommended for dwelling occupants to keep internal doors open at all times where possible so to allow air movement between rooms. Openable windows in non-habitable spaces such as landing/halls and bathrooms have been modelled and can contribute to the overall natural ventilation strategy for the dwelling.

Approved Document Part O stipulates bedroom doors must be modelled to be closed during sleeping hours, however there are no constraints during the day and are therefore modelled as open. All non-bedroom doors are considered open on a 24/7 basis.

7.3 Window Opening Schedule

Opening Schedule Description:

- **Window/Door Closed/Fixed**: Fixed pane, unopenable.
- **ADO section 2.6a (day) (Side hung)**: Closed overnight.
- **ADO section 2.6a (day) (Patio)**: Closed overnight.
- **ADO sections 2.6a+b (day & night) (Side hung):** Night open.

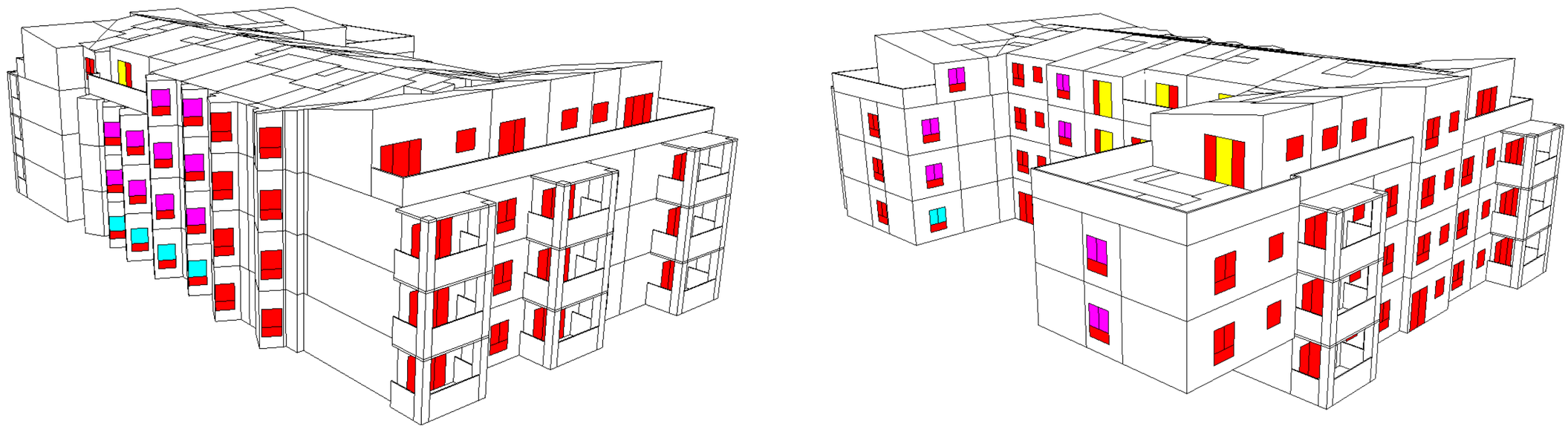


Figure 10: Window opening schedule key of the building.

7.4 Window Opening Restrictions

There has been a Noise and Vibration impact assessment completed for the apartment block building at the site of Albany Road, Chorlton. With the impact assessment completed it was found that some elevations (the red and blue elevations shown in the below image) must have the windows closed due to the external noise from the nearby tram line and main roads.

Where these noise implications effect the openability of the windows a form of mechanical ventilation in the form of MVHR (Mechanical Ventilation with Heat Recovery) is required to help keep the internal temperatures at a comfortable level.

There were not many apartments found to be safe from these noise issues, therefore it has been recommended that MVHR is installed throughout all of the apartments within the building.

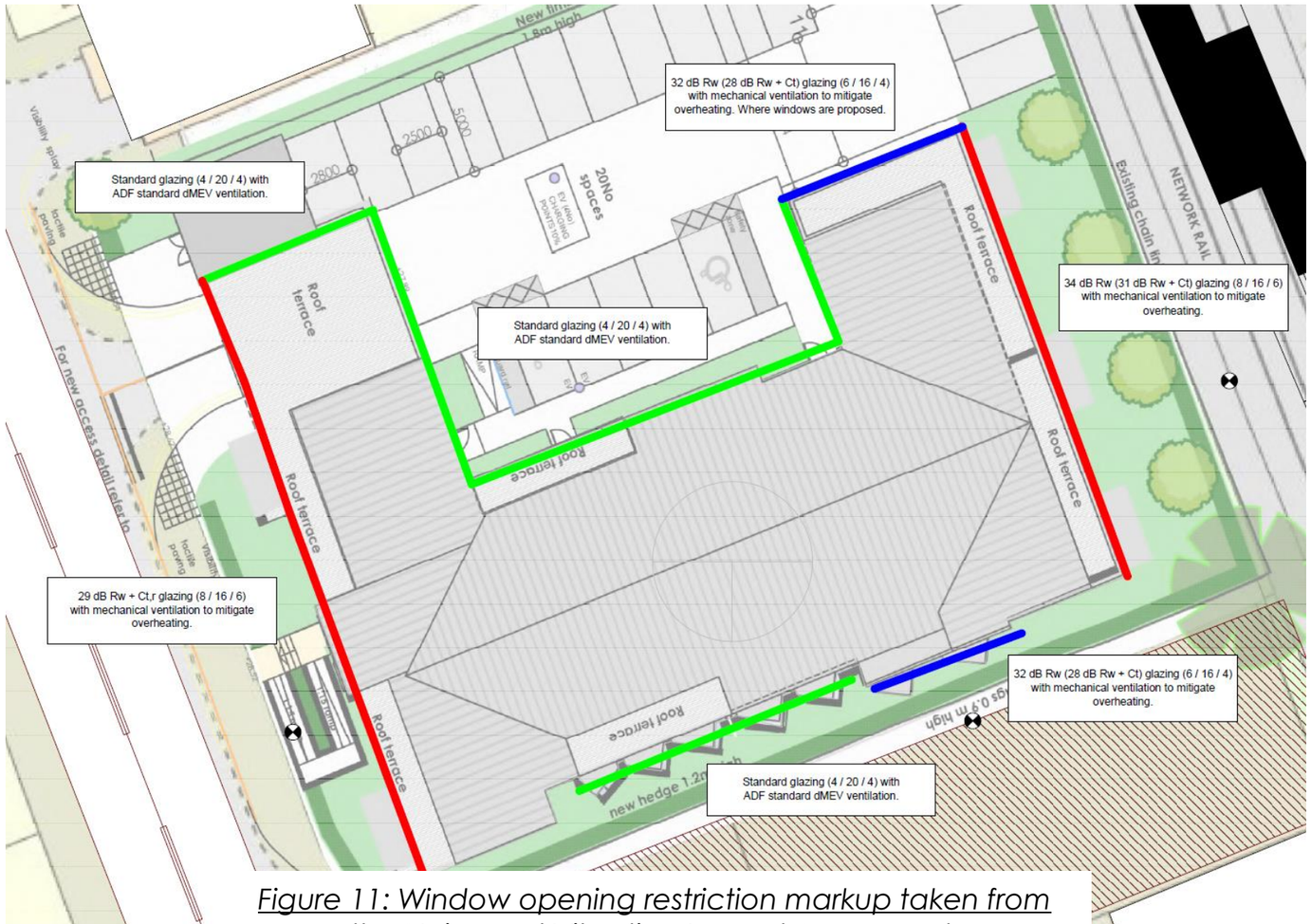


Figure 11: Window opening restriction markup taken from the Noise and Vibration Impact Assessment.

7.5 MECHANICAL VENTILATION

Mechanical ventilation in the form of MVHR is proposed for the dwelling, known as system 4.

This is a low energy, continuous mechanical ventilation system designed to replace conventional extract ventilation systems (such as intermittent systems) by drawing moisture laden air out of the kitchen and wet rooms (bathrooms and utility) while supplying fresh air to habitable rooms such as Bedrooms and Living spaces.

An additional benefit is an air pathway is also formed drawing warm air out of habitable spaces and evacuated from the dwelling, with the makeup air being provided by mechanically supplied air from the unit in addition to any windows in habitable spaces (when opened).

The minimum whole house ventilation rates can be seen in table 1.3 – these have been taken from *Approved Document F.*
For more information, please refer to Approved Document F, Volume 1: Dwellings.
The following required supply rates for TM59 compliance in habitable rooms are as follows:

- Bedrooms where the windows are openable: 6l/s + 9l/s of boost activated when the internal temperature exceeds 22°C
- Bedrooms where the windows are closed due to noise issues: 6l/s + 24l/s of boost activated when the internal temperature exceeds 22°C
- Kitchens where the windows are openable: 13 l/s + 7l/s of boost activated when the internal temperature exceeds 22°C
- Kitchens where the windows are closed due to noise issues: 13l/s + 22l/s of boost activated when the internal temperature exceeds 22°C

Table 1.3 Minimum whole dwelling ventilation rates by no. of bedrooms

Number of bedrooms[1][2]	Minimum ventilation rate by no. of bedrooms (l/s)
1	19
2	25
3	31
4	37
5	43

NOTES:
1. If the dwelling only has one habitable room, a minimum ventilation rate of 13l/s should be used.
2. For each additional bedroom add 6l/s to the values in Table 1.3

▲ *Total Combined rate of continuous ventilation in the dwelling needs to meet the above minimum rates.*

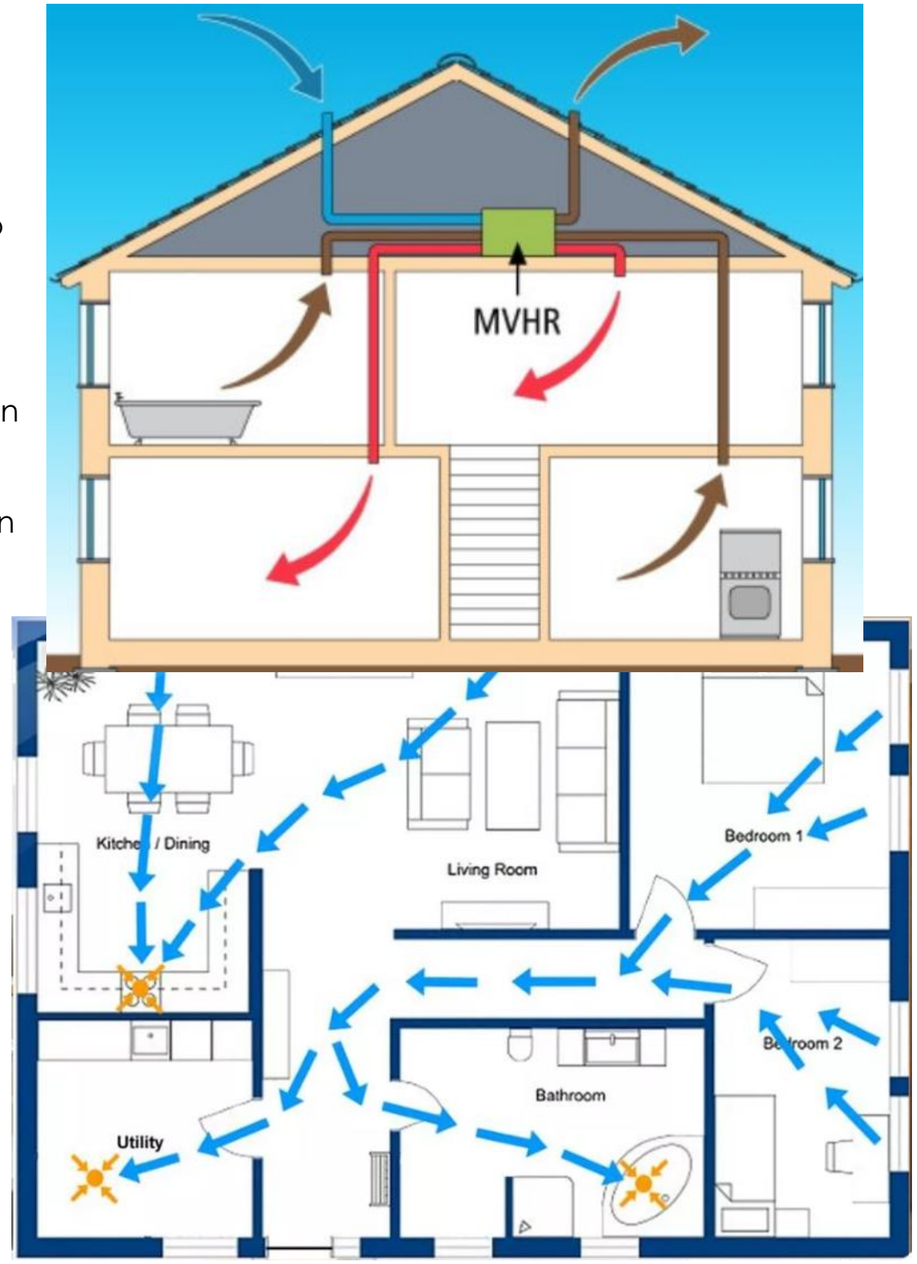


Figure 12: Depiction of air paths within a dwelling using an MVHR system

8 ENSURING THE OVERHEATING STRATEGY IS USABLE

Approved Document O lists a number of measures to ensure the overheating mitigation strategy can be feasibly implemented in reality, as well as complying with overlapping building codes. The full literature can be found in *Section 3: Ensuring the overheating mitigation strategy is usable* of Approved Document O. A summary of these standards has been compiled below:

8.1 NOISE

- **3.2)** In locations where external noise may be an issue (for example, where the local planning authority considered external noise to be an issue at the planning stage), the overheating mitigation strategy should take account of the likelihood that windows will be closed during sleeping hours (11pm to 7am).

- **3.3)** Windows are likely to be closed during sleeping hours if noise within bedrooms exceeds the following limits: A) 40dB LAeq,T, averaged over 8 hours (between 11pm and 7am) & b) 55dB LAFmax, more than 10 times a night (between 11pm and 7am).

8.2 POLLUTION

- **3.5)** Buildings located near to significant local pollution sources should be designed to minimise the intake of external air pollutants. Guidance is given in Section 2 of Approved Document F, Volume 1: Dwellings.

8.3 SECURITY

- **3.6)** When determining the free area available for ventilation during sleeping hours, only the proportion of openings that can be opened securely should be considered to provide useful ventilation. This particularly applies in the following locations, where openings may be vulnerable to intrusion by a casual or opportunistic burglar.
  a) Ground floor bedrooms
  b) Easily accessible bedrooms

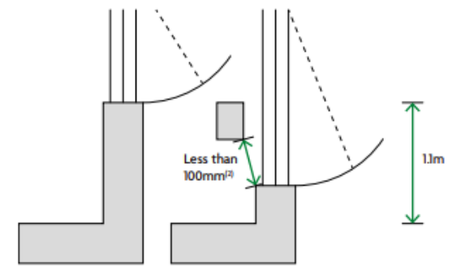
8.4 PROTECTION FROM FALLING

- **3.8)** Openings which are intended to be open for long periods to reduce overheating risk might pose a higher risk of falls from height. Only the proportion of openings which can be opened with a very low risk of occupants falling from height should be considered to form part of the overheating mitigation strategy.
- **3.9)** Openings that can be opened wider than 100mm may form part of the overheating mitigation strategy where they meet all of the following conditions:
  a) Window handles on windows that open outwards are not more than 650mm from the inside face of the wall when the window is at its maximum openable angle.
  b) Guarding meets the minimum standards in Table 3.1
  c) Guarding does not allow children to easily climb it. For example, horizontal bars should generally be avoided.

  For more information, please refer to *Approved Document K*.

Table 3.1 Guarding heights

Change in floor level between inside and outside	Guarding height[1]
Less than 600mm	See Approved Document K
More than 600mm	1.1m



NOTES:
1. This approved document has increased levels of protection from falling compared to Approved Document K. Where applicable, the higher standard applies.
2. Guarding should be sized to prevent the passage of a 100mm sphere.

Figure 13: Guarding heights (from Approved Document K)

9 RESULTS SUMMARY

Results Summary

#	House Type	Dwelling Description	Overheating	TM59/Part O Compliance	Notes	Results
1	1 Bed	1 bed, 2 person apartment	Natural Ventilation where possible + g value 0.30 + MVHR	☑	Passive overheating strategy sufficient	Appendix A
2	2 Bed	2 bed, 3 person apartment		☑	Passive overheating strategy sufficient	Appendix B

See Appendix A and B for full detailed results.

10 Assessment Conclusions

The assessment has shown that the assessed residential apartments present a low chance of overheating – with the detailed dynamic thermal modelling has shown where the risk is likely to occur.

Ground floor spaces are limited to a 'daytime only' window opening schedule which limits the amount of hours which natural ventilation can take place. Secondly, these spaces cannot take advantage of cooler night temperatures to purge the room of the warm air from internal and solar gains accumulated throughout the day. The ground floor assessed spaces in the houses however were able to sufficiently mitigate the warm temperature build up by:

- Natural ventilation via window openings as per the architectural drawings.
- Window openings to be opened to maximal permissible opening angles in accordance with Approved Document K (safeguarding measures may be required)
- Keeping the external patio doors fully open throughout the day (when required) to stimulate air movement throughout the entire dwelling.
- Opening of non-habitable windows (such as landings/halls and bathrooms) to help ventilate the whole house.
- Glazing solar performance (g value) of 0.30
- Internal doors to be left open, when possible, to promote air movement in and out of rooms within the dwellings.
- MVHR (system 4) providing whole house continuous mechanical ventilation using flow rates stated in section 7.4 of this report.

With the above measures implemented, the modelling found all spaces in the apartments to pass the overheating criteria and comply with Part O building regulations.

Though the regulations do not permit the use of blinds and curtains in the calculations, if the sun shines directly into a living space, the occupant should consider closing the curtains or blinds to limit solar gains and try and keep rooms as cool as possible.

Mitigating overheating will rely on the end user operation and understanding of overheating. Heat comes into the house in two ways: solar radiation from the sun, and hot air. We need to limit both to prevent overheating, which may require closing both the windows and curtains on the warmest days.

If it's cooler inside than outside, it is advised that occupants should keep their windows closed, to prevent bringing warm air in. If it reaches a point where the temperature inside the house is equal to that outside, then you should open the windows, keeping the curtains closed.

11 Modelling Disclaimer

The calculations produced by PB Sustainability have been carried out with the information provided by others to determine whether the thermal model of the proposed building can achieve compliance, at design stage, with the stated criteria within this report.

It should be noted that the data generated by this work is obtained using computer simulations. These simulations are the best means of predicting the performance of the building at this stage. Full certainty can only be achieved by measuring the performance of the building and associated systems after a period of use.

The actual operative temperatures within the building once occupied may vary from the calculated values within this report. These differences will occur due to a number of variable parameters between the modelled building and the actual building. Such differences will include the hours, levels of occupancy, equipment, how the windows are used etc.

Whilst the simulations have been undertaken in good faith using reasonable skill and care, PB Sustainability can take no responsibility for differences between the computer simulations and the actual performance of the completed development due to the inherent complexity and variability of the physics in a building and its environment.

12 Appendix C - Detailed Occupancy Schedules – CIBSE TM 59 Heat gain Profile

Number of People	Description /Occupancy	Period																						
		00-01	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	20-21	21-22	22-23	23-24
		Hour ending																							
		1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00	18.00	19.00	20.00	21.00	22.00	23.00	24.00
1	Single Bedroom	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.7
2	Double Bedroom	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	0.7
2	Studio	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.7
1	1-bedroom /living/Kitchen	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
1	1 - bedroom /living	0	0	0	0	0	0	0	0	0	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0	0
1	1 - bedroom Kitchen	0	0	0	0	0	0	0	0	0	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0	0
2	2-bedroom /living/Kitchen	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
2	2 - bedroom /living	0	0	0	0	0	0	0	0	0	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0	0
2	2 - bedroom Kitchen	0	0	0	0	0	0	0	0	0	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0	0
3	3 - bedroom/living/Kitchen	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
3	3 - bedroom /living	0	0	0	0	0	0	0	0	0	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0	0
3	3 - bedroom Kitchen	0	0	0	0	0	0	0	0	0	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0	0

13 Appendix D – Compliance Checklist (Approved Document O – Appendix B – Part 2B)

2b.1 Modelling details			
Dynamic software name and version	IES Virtual Environment 2023 (Version 2023.5.1.0)		
Weather file location used, including any additional, more extreme weather files	Manchester _DSY1_2020High50_.epw		
Number of sample units modelled, including an explanation of why the size/selection has been chosen	Apartments 1-40 have been assessed in their correct orientations.		
2b.2 Modelled occupancy			
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?[1]		**Yes**	~~No~~
Details of the occupancy profiles used	As per imported ADO dataset profiles		
Details of the equipment profiles used	As per imported ADO dataset profiles		
Details of the opening profiles used	As per imported ADO dataset profiles		
2b.3 Modelled overheating mitigation strategy			
Free areas	Fully openable where there are no noise issues but handles within 650mm limit of inside wall face as per section 3.9 of ADO		
Infiltration and mechanical flow rates	Based on Table 4.24 of CIBSE Guide A for an air permeability target of $3m^2/(h.m^2)$. MVHR to kitchen + bedrooms as per Approved Document F minimum requirements.		
Window g-value	Windows & Doors (0.30)		
Shading strategy	N/A		
Mechanical cooling	N/A		
2b.4 Modelling results			
Has the project passed the assessment described in CIBSE's TM59, taking into account the limits detailed in paragraphs 2.5 and 2.6?[1]		**Yes**	~~No~~
What is the overall overheating strategy (i.e. what design features are key to the project	Fully openable windows for the elevations which do not have noise issues, MVHR to all kitchen + bedrooms (see report).		
2b.5 Designer's declaration			
Has the building construction proposal been modelled accurately?		**Yes**	~~No~~
Designer's name	Daniel Willis		
Designer's organisation	Complete Sustainability Solutions Ltd		
Designer's signature	DW		
Registration number (if applicable)	N/A		
Date of design	11/07/24		

Note:
[1] All references to paragraphs are to Approved Document O