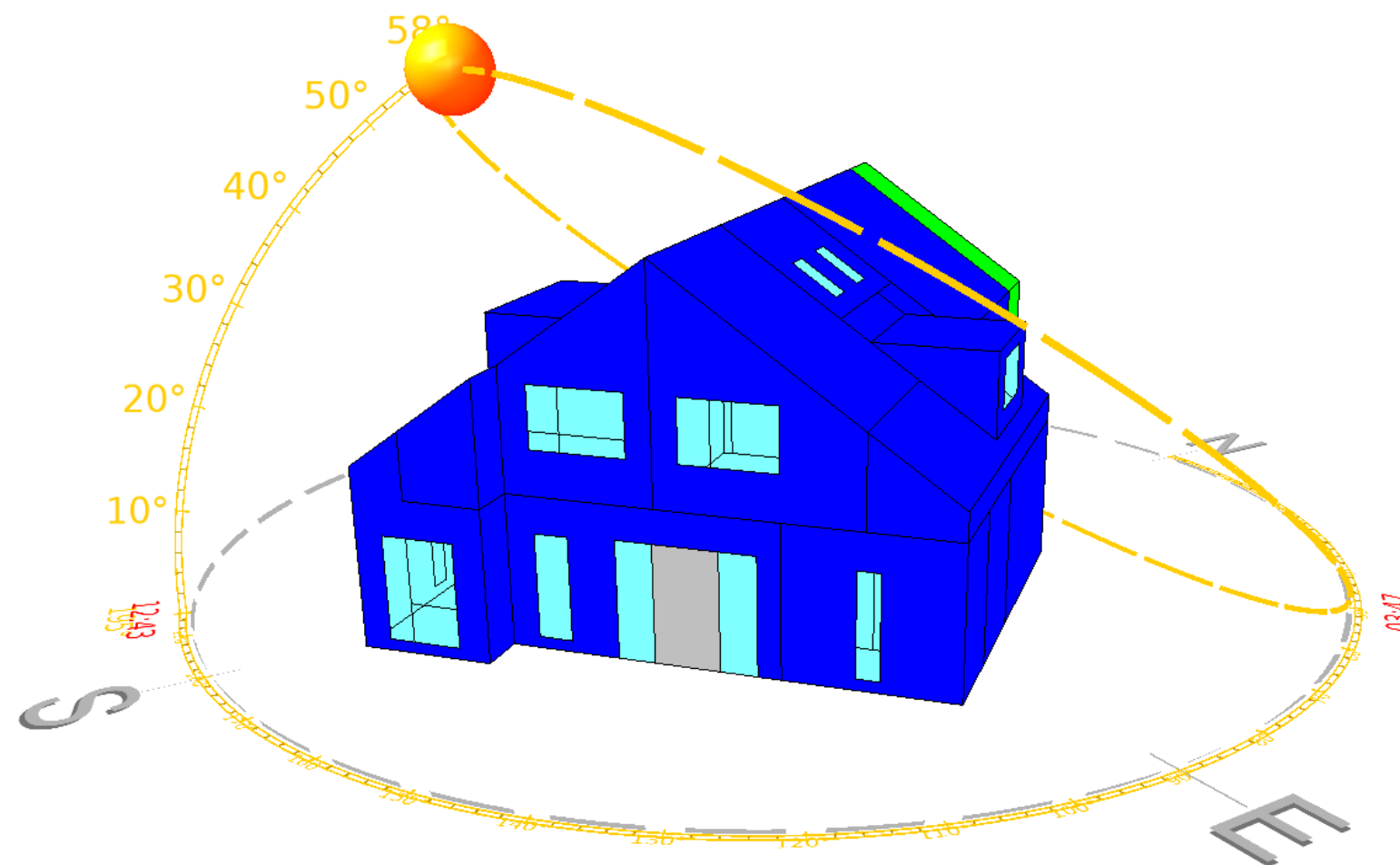


95 Marland Fold Rochdale

CIBSE TM59 Overheating Analysis In accordance with Part O



OVERHEATING REPORT OF 95 MARLAND FOLD, ROCHDALE, MANCHESTER

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Prepared by:	Signature	Date
Daniel Willis	<i>DW</i>	09.10.25

Revision Record			
Rev	Date	By	Summary of Changes
-	09.10.25	DW	-



1 EXECUTIVE SUMMARY

This report presents an analytical study of the overheating outcomes for the proposed dwelling at the 95 Marland Fold residential development in Rochdale, Manchester and assesses the dwelling 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 dwelling has been assessed against the DSY1 weather file to determine the likelihood of overheating to occur, with the modelling assessing the dwelling according to the proposed site-plan layout to stress-test the proposed overheating strategy.

The proposed natural ventilation strategy includes openable windows as per the architectural drawings/elevations. Opening schedules are detailed within this report, with all upper floor opening windows being put on 100mm restrictors as the sill heights do not meet the 1100mm from finished floor level threshold falling from height safeguarding measure.

It has been assumed that there are no acoustical limitations that prevent the use of opening windows as an overheating mitigation strategy during overnight hours, however all windows on the ground floor are assumed to be closed overnight for security / accessibility reasons outlined in AD O.

The mechanical ventilation strategy for the site included MVHR (system 4), providing continuous mechanical ventilation to the kitchens and bedrooms at ventilation rates stated on page 13 of this report.

A glazing g value of 0.63 (BS EN 410) has been considered to prevent excessive solar gains.

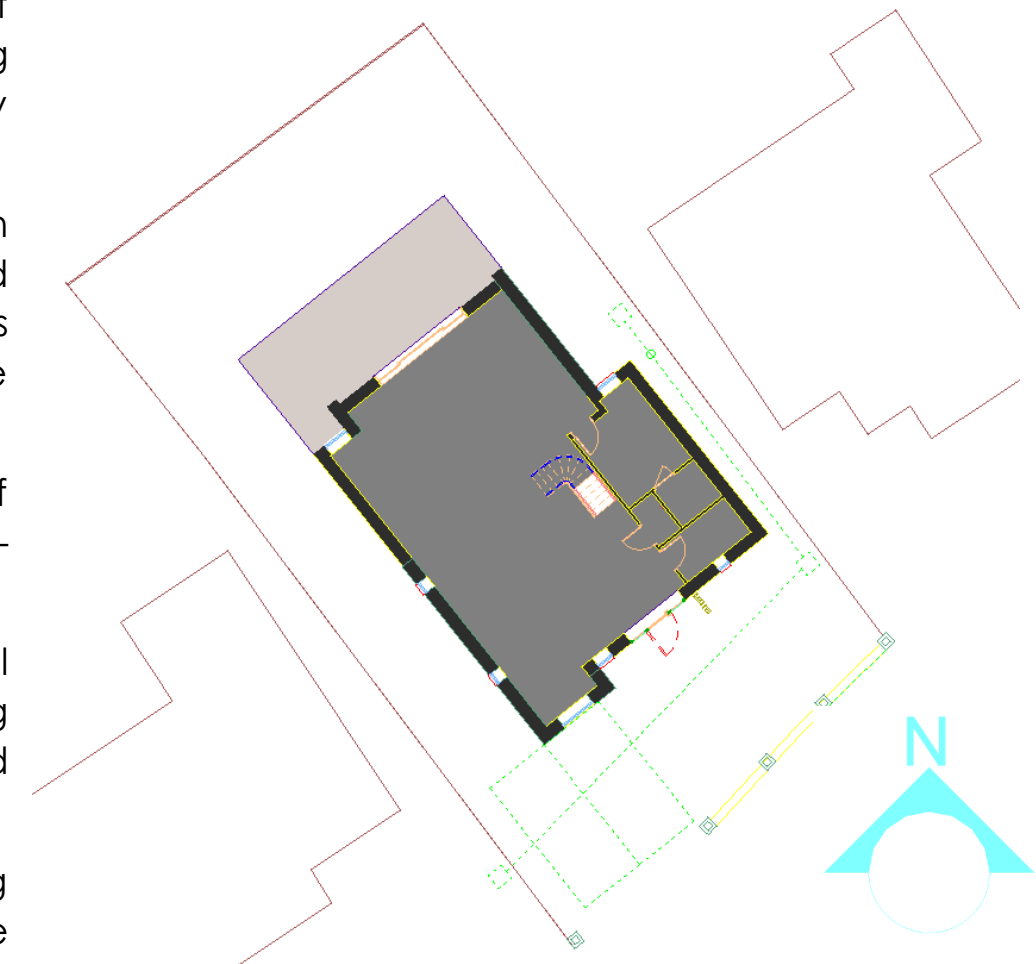


Figure 1: Site plan of the proposed development



Assessment findings

The assessment found the assessed dwelling is able to meet the TM59 overheating criteria and therefore achieve Part O compliance with the building design described in this report. However, a number of key measures that are required are listed below:

- 1) The dwelling has been modelled with its ground floor openings as closed during the nighttime.
- 2) First Floor openable windows have been put on 100mm restrictors as these openings fall below the ADO guidance of 1100mm above finished floor level.
- 3) Mechanical ventilation via MVHR to kitchen and bedrooms at minimum approved document F ventilation rates (13l/s kitchen, 6l/s in each bedroom)
- 4) Glazing g value of 0.63 (BS EN 410)

Table 1: Summary of Results

#	Unit Type	Quantity	Overheating Strategy Summary	TM59 / Part O Compliance?	Detailed Results
1	3B6P Detached House	1	- Easily accessible ground floor windows closed during the nighttime - First floor openings on 100mm restrictors. - MVHR Ventilation to kitchen + bedrooms (with minimum part F ventilation rates of 13l/s kitchen, 6l/s in each bedroom) - G value 0.63 (BS EN 410)	☑	Appendix A



2 INTRODUCTION

This report reviews the overheating risk assessment carried out for the proposed dwelling at 95 Marland Fold in Rochdale, Manchester, 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 spaces within the assessed dwelling.

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(s) 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.

Moreover, this Overheating Assessment for the dwelling 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.

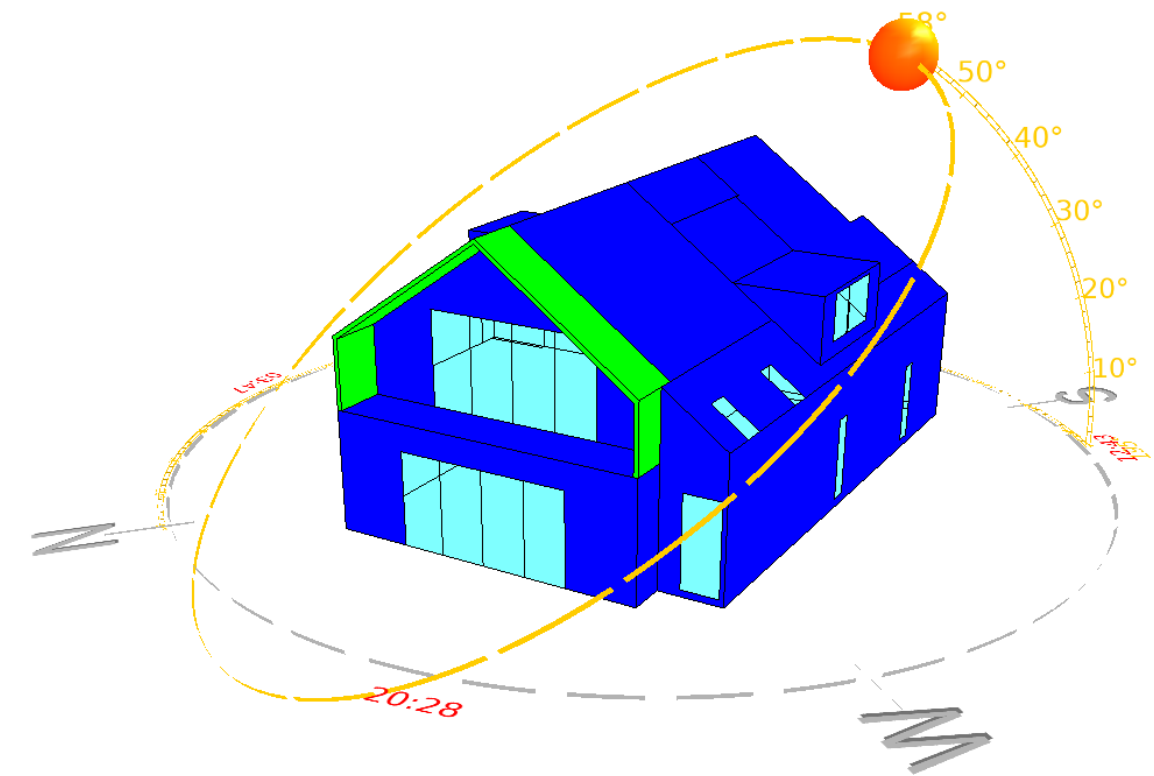


Figure 2: IES VE Model of the assessed development



2.1 SITE PLAN

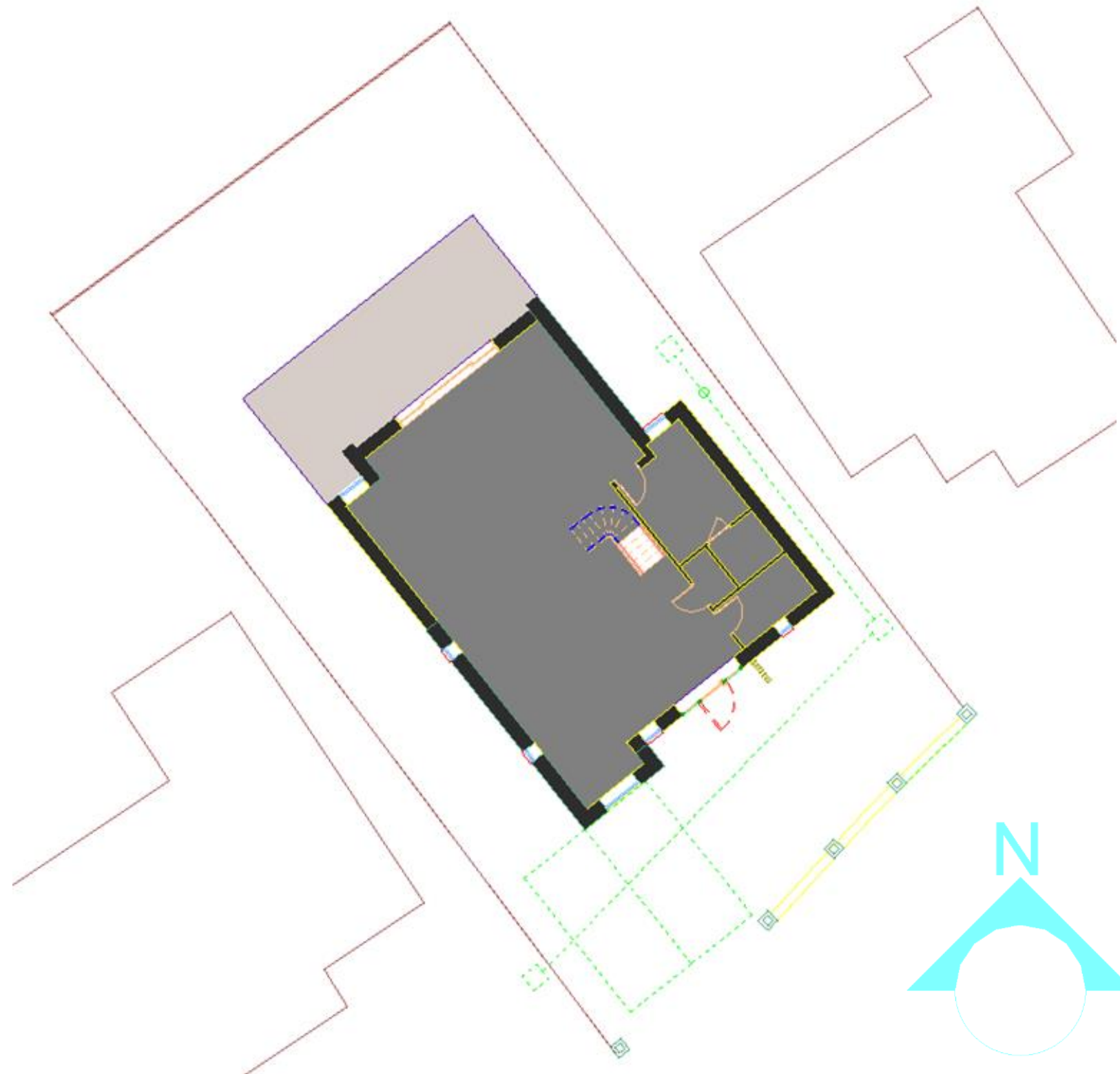


Figure 3: Architectural site plan of residential development



2.2 VULNERABLE TO INTRUSION / EASILY ACCESSIBLE WINDOWS

Part O stipulates in section 3.6 *Security* that openings which may be vulnerable to intrusion by a casual or opportunistic burglar includes the following:

- a) Ground Floor Bedrooms
- b) Easily accessible bedrooms

With 'Easily Accessible' being defined as one of either of the following definitions:

- A window or doorway, any part of which is within 2m vertically of an accessible level surface, such as the ground or basement level, or an access boundary
- A window within 2m vertically of a flat or sloping roof (with a pitch of less than 30 degrees) that is within 3.5m of ground level.

Any windows which can be attributed with any of the above two criteria therefore are required to be closed overnight to ensure compliance with Part O stipulations is adhered to, which has been taken into account during the modelling processes, and extended to non-bedroom windows (such as bathrooms and landings which are often used as additional window openings to can aid the removal of excess heat in dwellings) which may act as access points into the dwelling for opportunistic burglars etc.

Analysis has found that for the dwelling, all ground floor windows have been modelled as closed overnight.

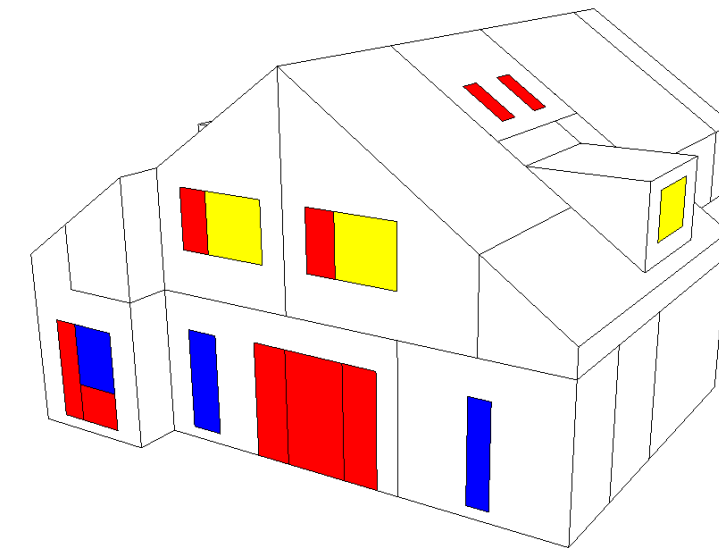


Figure 4: Window Opening Schedule Depiction

Opening Type	
■	XTRN0000 (Window / Door Closed)
■	XTRN0002 (ADO section 2.6a (day) - Glazed Doors)
■	XTRN0003 (ADO section 2.6a (day) - Window)
■	XTRN0006 (ADO section 2.6a + b (day & night) - 100mm Window)

Opening Schedule Description:

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



2.3 NOISE / ACOUSTICAL IMPACT ASSESSMENT

Part O stipulates in section 3.2 *Noise at Night* 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).

On the proposed development, no acoustical assessment has been provided, so it is proposed that the dwelling has no acoustic limitations at this stage.

2.4 PROTECTION FROM FALLING (APPROVED DOCUMENT K)

- **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*.

Analysis has found that all of the upper floor windows in the dwelling are to be placed on 100mm restrictors as the sill heights are below the minimum threshold of 1100mm above the Finished Floor Level.



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 criterion. 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 dwelling in this assessment is assessed against 'predominantly naturally ventilated' criteria.

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

Table 2: Overheating Assessment Categorisation

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 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 dwelling.

4.2 EXTERNAL ENVELOPE

The following U-values have been used: -

Table 3: Building envelope U-values

Element	Modelled U Value (W/m ² K)
External Wall	0.15
Ground Floor	0.11
Roof	0.08
Glazed Windows	1.40
Rooflights	1.40
Doors	0.90

4.3 GLAZING SPECIFICATION

The glazing is based on a G-value of 0.63 (BS EN 410) for windows, glazed doors and Rooflights.

4.4 INTERNAL WINDOW BLINDS

Internal blinds have not been included in the calculations

4.5 WEATHER

For the purposes of this overheating assessment, the **Manchester_GTW_DSY1_2020High50_.epw** (with a peak summer temperature of 30.0°C) has been used.

4.6 SITE & ORIENTATION

The dwelling has been modelled in its correct orientation based on the site plan provided.

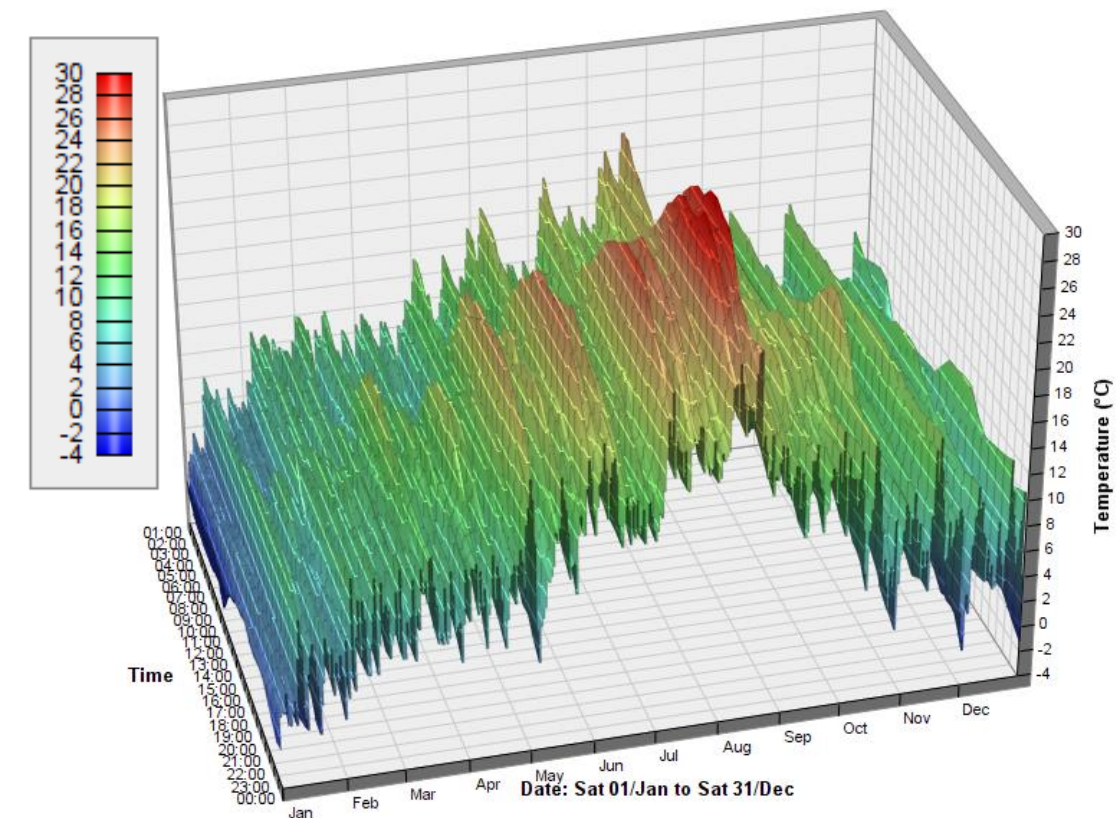


Figure 5: Annual dry-bulb temperature graph of modelled weather file



5 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 I for a detailed CIBSE TM59 internal gain schedule.

5.1 OCCUPANCY

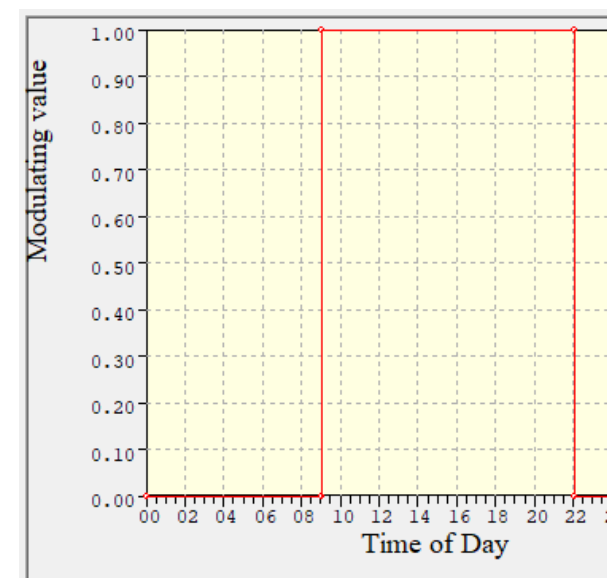
Based on CIBSE Guide A (2015a), a maximum sensible heat gain of 75W/person is assumed in the living spaces. An allowance for 30% reduced gain during sleeping is based on Addendum g to ANSI/ASHRAE Standard 55-2010.

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

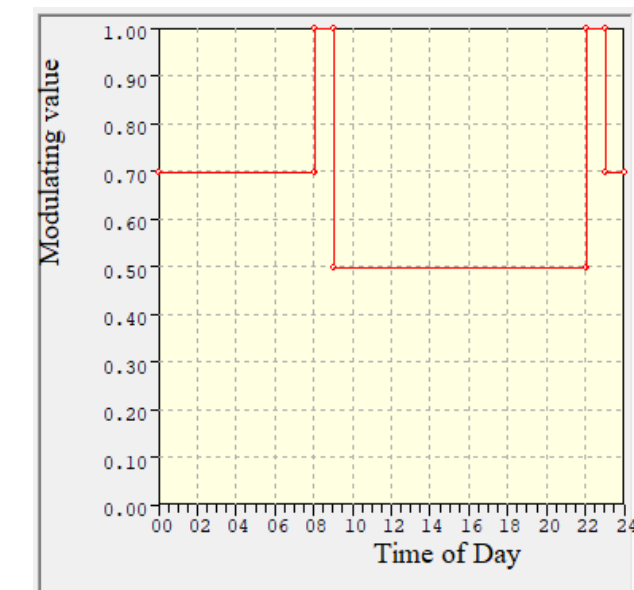
Occupant Gains

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



5.2 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/m ²)
living/kitchen/dining areas, bedrooms	2
	0

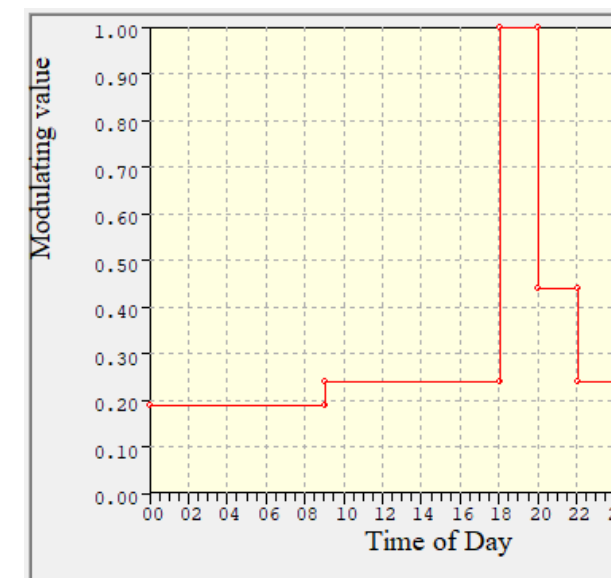
Lighting gains

5.3 EQUIPMENT

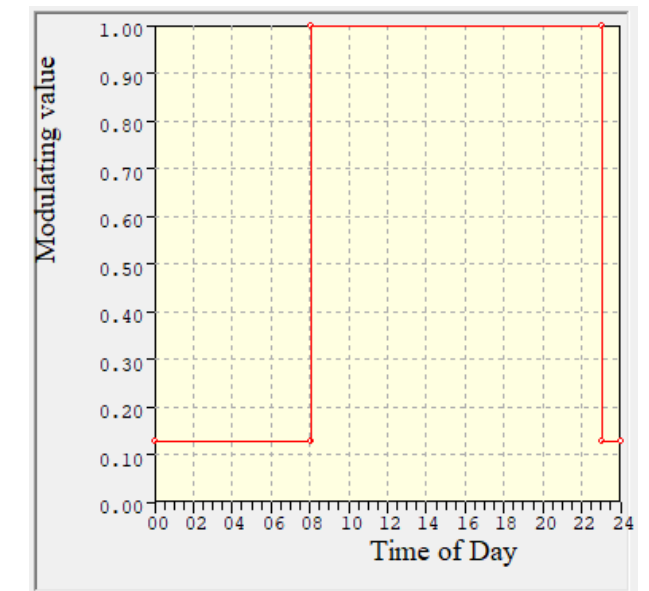
Equipment gains per room type are listed in the table below.

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



6 VENTILATION

6.1 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 m²).

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:

- 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.
- Guarding meets the minimum standards in Table 3.1
- Guarding does not allow children to easily climb it. For example, horizontal bars should generally be avoided.

See section 7 of this report for more information.

6.2 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.

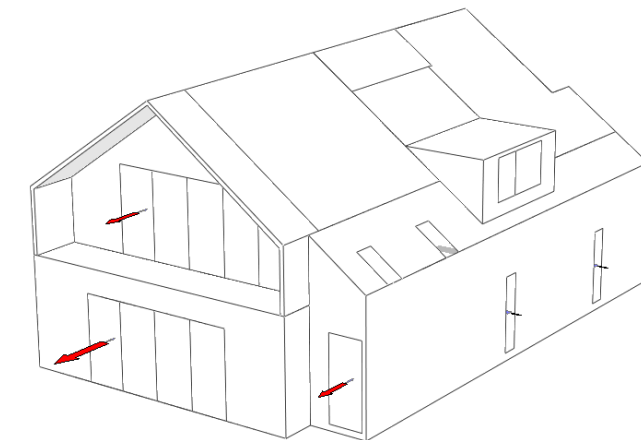
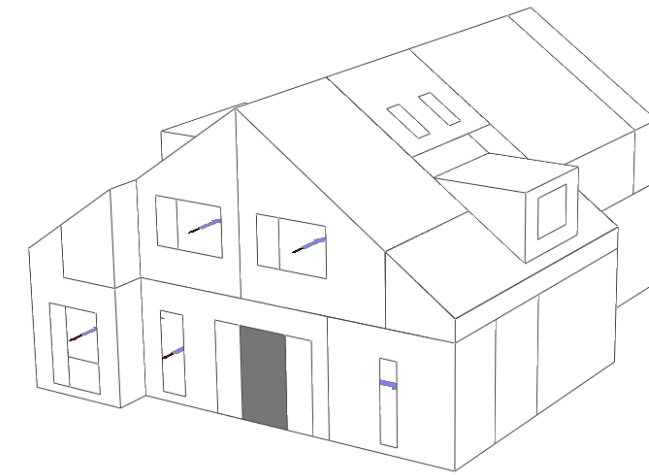
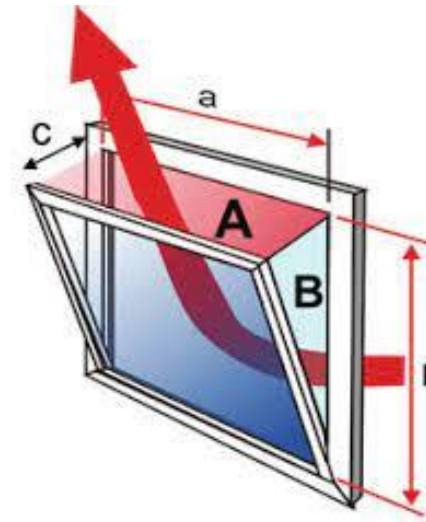


Figure 6: Natural ventilation airflow depiction of the development



6.3 WINDOW OPENING SCHEDULE

Opening Schedule Description:

2.5 CIBSE's TM59 method requires the modeller to make choices. The **dynamic thermal modelling** method in this section applies limits to these choices, which are detailed in paragraph 2.6. These limits should be applied when following the guidance in CIBSE's TM59.

2.6 All of the following limits on CIBSE's TM59, section 3.3, apply.

- a.** When a room is occupied during the day (8am to 11pm), openings should be modelled to do all of the following.
 - i. Start to open when the internal temperature exceeds 22°C.
 - ii. Be fully open when the internal temperature exceeds 26°C.
 - iii. Start to close when the internal temperature falls below 26°C.
 - iv. Be fully closed when the internal temperature falls below 22°C.
- b.** At night (11pm to 8am), openings should be modelled as fully open if both of the following apply.
 - i. The opening is on the first floor or above and not **easily accessible**.
 - ii. The internal temperature exceeds 23°C at 11pm.
- c.** When a ground floor or **easily accessible** room is unoccupied, both of the following apply.
 - i. In the day, windows, patio doors and balcony doors should be modelled as open, if this can be done securely, following the guidance in paragraph 3.7 below.
 - ii. At night, windows, patio doors and balcony doors should be modelled as closed.
- d.** An entrance door should be included, which should be shut all the time.

- Opening Type
- XTRN0000 (Window / Door Closed)
 - XTRN0002 (ADO section 2.6a (day) - Glazed Doors)
 - XTRN0003 (ADO section 2.6a (day) - Window)
 - XTRN0006 (ADO section 2.6a + b (day & night) - 100mm Window)
 - XTRN0008 (Living Internal Door)
 - XTRN0009 (Bedroom Internal Door)

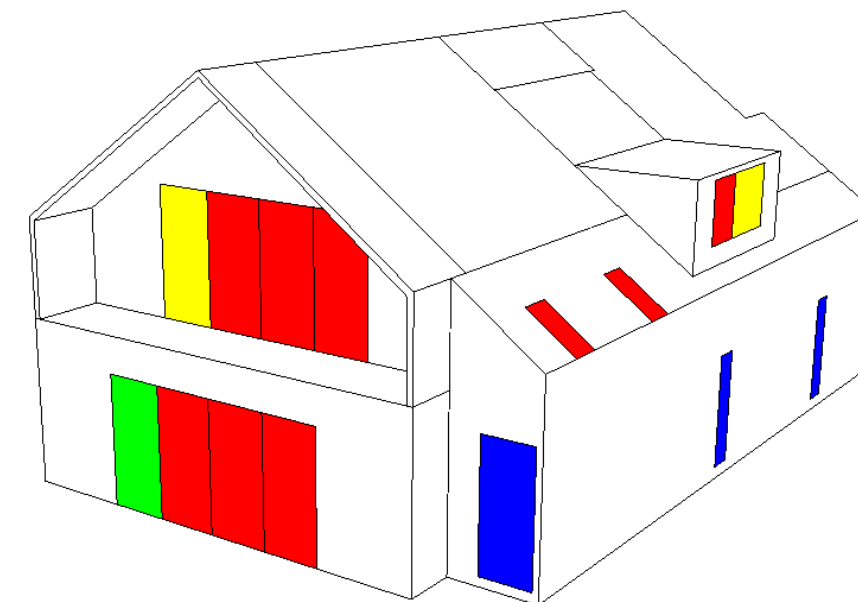
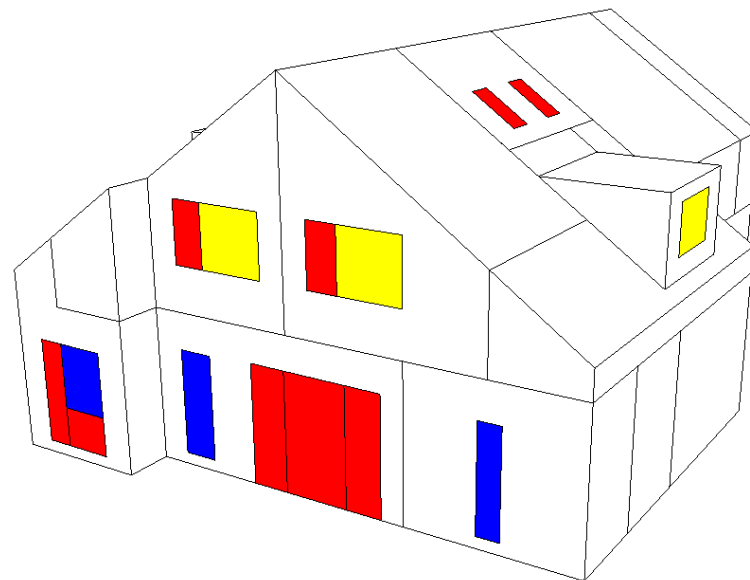


Figure 7: Window opening schedule key



6.4 MECHANICAL VENTILATION

Mechanical ventilation in the form of MVHR is proposed for the dwelling, classified 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:

- Kitchen: 13l/s
- Bedrooms: 6l/s

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.*

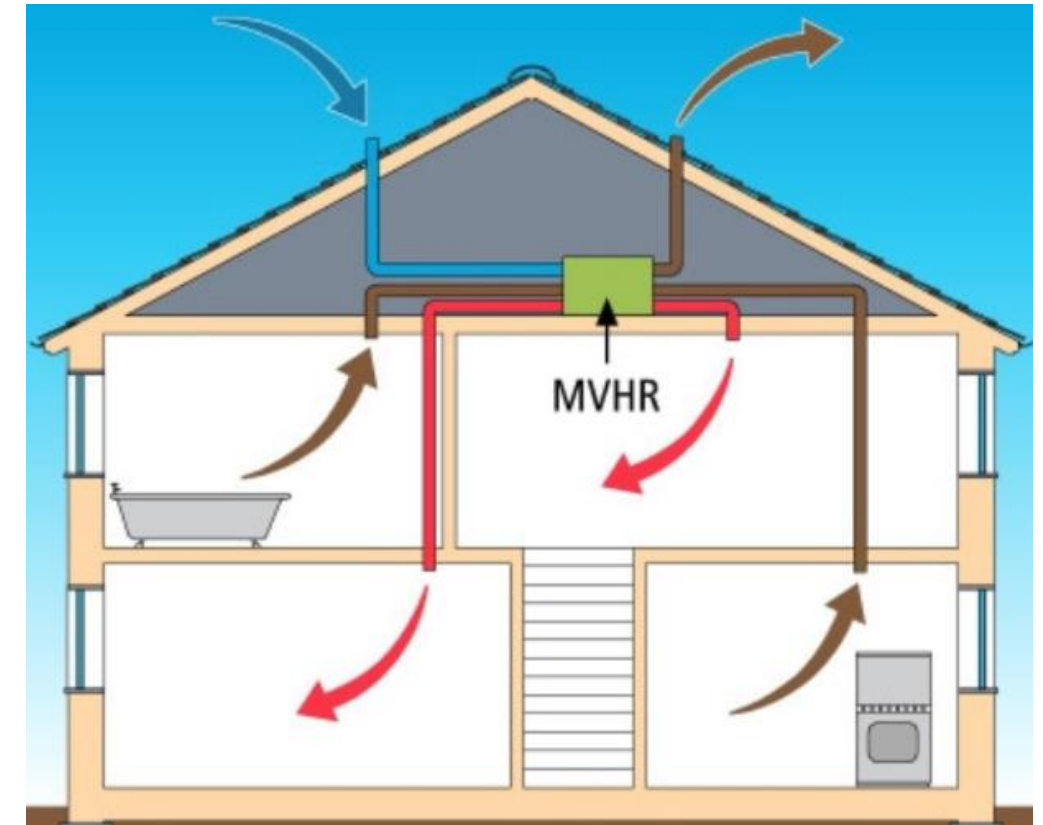


Figure 8: Depiction of air paths within a dwelling using an MVHR system



7 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:

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).

Site applicability: See page 6 of this report.

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.

Site applicability: Not applicable to the site.

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

Site applicability: See page 5 of this report.



Protection from Falling

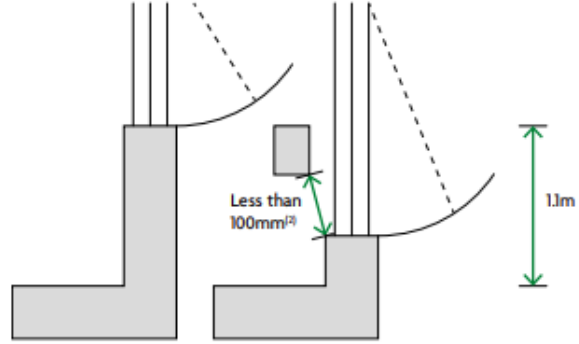
- **3.8)** Openings which are intended to be open for long periods to reduce overheating risk might pose a higher risk of falls from height. Only the proportion of openings which can be opened with a very low risk of occupants falling from height should be considered to form part of the overheating mitigation 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:
 - d) 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.
 - e) Guarding meets the minimum standards in Table 3.1
 - f) 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*.

Site applicability: See page 6 of this report.

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 9: Guarding heights (from Approved Document K)



8 RESULTS SUMMARY

Table 4: Summary of Results

#	Unit Type	Quantity	Overheating Strategy Summary	TM59 / Part O Compliance?	Detailed Results
1	3B6P Detached House	1	- Easily accessible ground floor windows closed during the nighttime - First floor openings on 100mm restrictors. - MVHR Ventilation to kitchen + bedrooms (with minimum part F ventilation rates of 13l/s kitchen, 6l/s in each bedroom) - G value 0.63 (BS EN 410)	☒	Appendix A



9 ASSESSMENT SUMMARY

The assessment has shown that the assessed residential dwelling presents a low chance of overheating – with the detailed dynamic thermal modelling showing where the risks are likely to occur.

Natural ventilation via openable windows forms the primary overheating mitigation strategy for the site, with it being assumed that there are no limits to the use of opening windows (day and/or night) for overheating purposes from the lack of a noise impact assessment. However, the ground floor bedroom windows have been modelled with the openings closed overnight as the windows can be detailed as 'easily accessible' as outlined in AD O, as well as first floor openings with a sill height below 1100mm of the finished floor level being put on 100mm restrictors.

A solar controlled window glazing g value of 0.63 (BS EN 410) has been considered to prevent excessive solar gains during summer months.

A summary of the overheating mitigation strategy is listed below:

- The dwelling has been modelled with the ground floor openings as closed during the night.
- Keeping the external patio doors 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
- Internal doors to be left open, when possible, to promote air movement in and out of rooms within the dwelling
- Glazing solar performance (g value) of 0.63 (BS EN 410)
- Mechanical ventilation via MVHR to kitchen and bedrooms at minimum approved document F ventilation rates (13l/s kitchen, 6l/s in each bedroom)

With the above measures implemented, the modelling found all spaces in the assessed dwelling 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.



10 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.

On the Approved Document O detailed report appendices, although PB Sustainability Ltd. is listed in the Approved Document O detailed report appendices under designer details, including organisation and address, we hold no responsibility for the design of the building, houses, or dwellings referenced. The term "designer" in this context refers solely to our role as a consultant interpreting drawings and details provided by the architect, client, or contractor. Our responsibility is limited to constructing and simulating the Part O overheating model within the IES software based on this information.



11 APPENDIX B - 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



12 APPENDIX C – COMPLIANCE CHECKLIST (APPROVED DOCUMENT O – APPENDIX B – PART 1)

1.1 Building and site details	
Residential building name/number	95
Street	Marland Fold
Town	Rochdale
County	Greater Manchester
Postcode	OL11 5RF
Proposed building use/type of building	Residential Development
Are there any security, noise or pollution	ADO security restriction to ground floor openings (closed overnight) and first floor openings (100mm restrictors)



13 APPENDIX D – COMPLIANCE CHECKLIST (APPROVED DOCUMENT O – APPENDIX B – PART 2B)

2b.1 Modelling details		
Dynamic software name and version	IES Virtual Environment 2024 (Version 2024.1.0.0)	
Weather file location used, including any additional, more extreme weather files	Manchester_GTW_DSY1_2020High50_.epw	
Number of sample units modelled, including an explanation of why the size/selection has been chosen	The dwelling has been assessed in its correct orientation as per the site plan provided.	
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	Ground floor windows fully openable but handles within 650mm limit of inside wall face as per section 3.9 of ADO. First floor windows on 100mm restrictors as the sill heights are below 1100mm from the finished floor level.	
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 with ventilation rates detailed on page 13 of this report.	
Window g-value	Windows (0.63) (BS EN 410)	
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 passing)?	Openable windows as detailed throughout the report. MVHR to kitchen + bedrooms with ventilation rates detailed on page 13 of this report. g value 0.63 (BS EN 410)	
2b.5 Designer's declaration		
Has the building construction proposal been modelled accurately?	Yes	No
Designer's name	Daniel Willis	
Designer's organisation	PB Sustainability Ltd	
Designer's signature	<i>DW</i>	
Registration number (if applicable)	N/A	
Date of design	09/10/25	