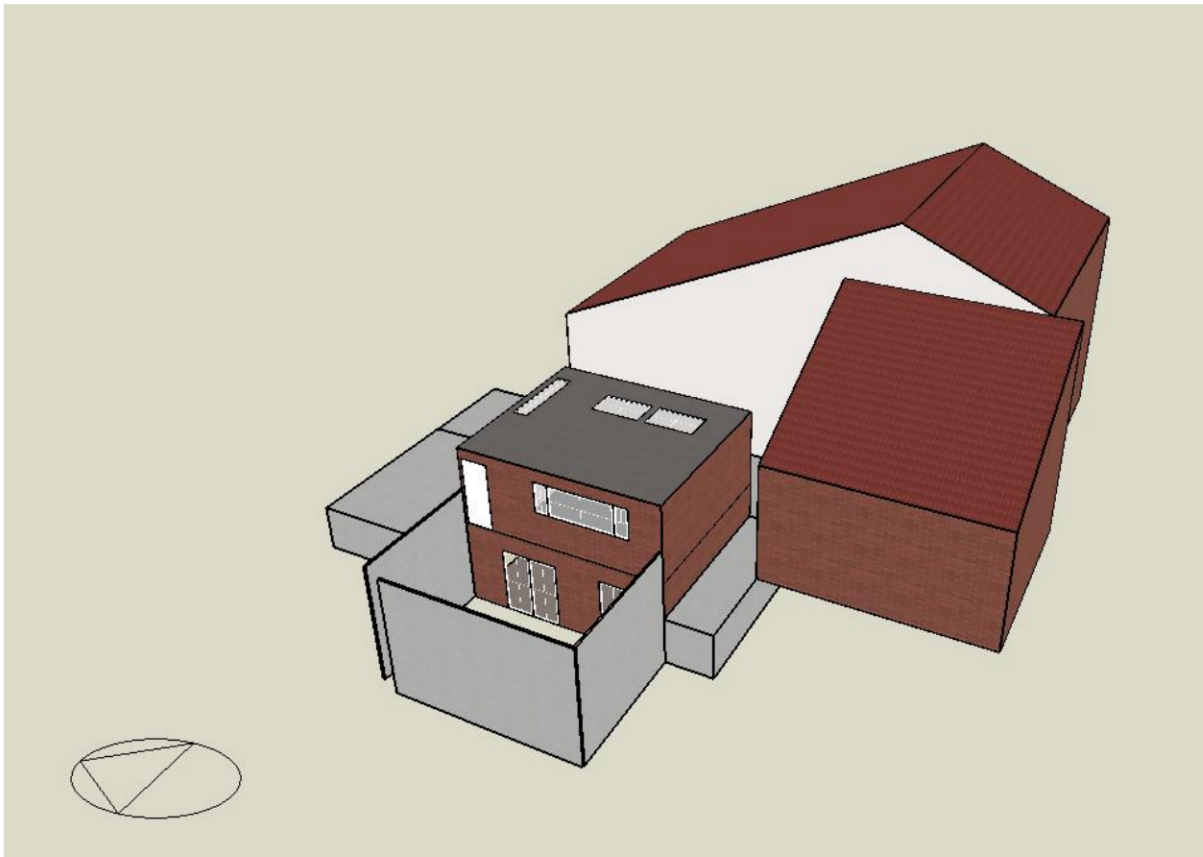




Domestic Overheating Assessment

Dynamic Thermal Modelling – Part O

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27th February 2026

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Document Status

Client: HAM Estate Ltd
c/o Aygul Boyraz Architecture

Site: 2 Caversham Road,
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N15 3QP

Proposals: New build detached two storey dwelling

Contents:

1	Scope	3
2	Executive Summary	3
3	Part O: Dynamic Thermal Modelling Method	5
4	CIBSE TM59 Assessment Criteria	7
5	The Model	8
6	Results	12
7	Summary	13

Appendices:

Appendix A: Dynamic Thermal Modelling (TM59) Results
Appendix B: Window Opening Schedule

Document Control Record:

Prepared by	Checked by	Date	Job	Revision
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1 Scope

This report has been prepared to assess the likelihood of overheating in the proposed residential development at 2 Caversham Road, London, which involves the construction of a detached two storey dwelling over lower ground and ground floor level. A CIBSE TM59 overheating assessment is required to demonstrate how the design will mitigate potential overheating risks and comply with the Haringey Council's planning requirements.

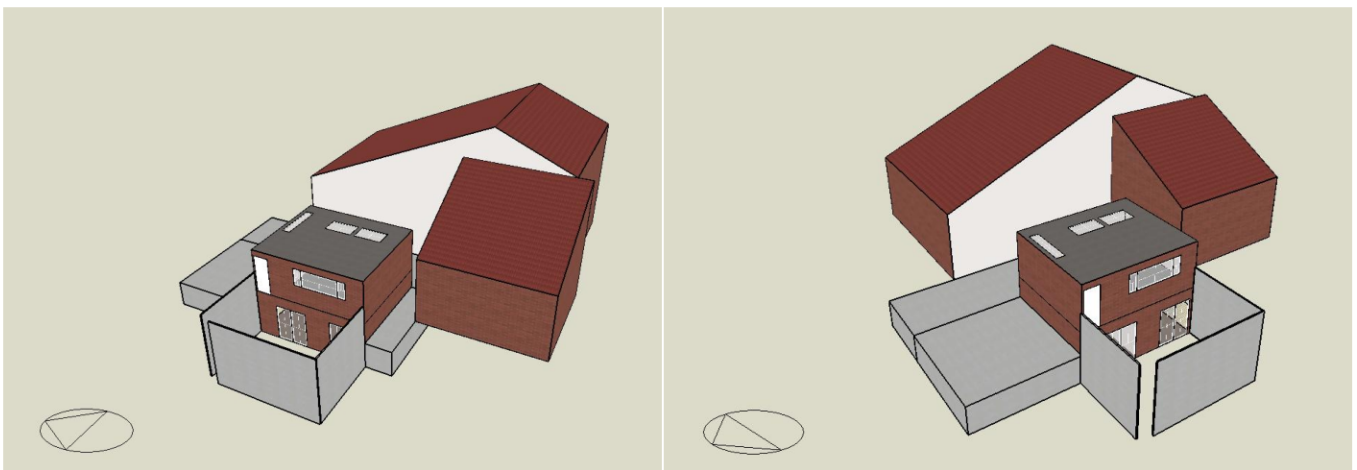
The intention is that this study helps inform and verify the design proposals, thereby providing the basis for mitigating overheating risk and producing houses that provide comfortable environmental conditions for occupants.

It is important to note that with any modelling exercise there are assumptions and approximations that must be made. As far as possible, details of all assumptions and approximations are supplied within the report. These were predominantly informed by information provided 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 demonstrates 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 Document Part O.

Figure 01 - DesignBuilder 3D Rendering



2 Executive Summary

An overheating assessment has been carried to demonstrate the potential conditions and risk of overheating for the proposed development.

The overheating mitigation strategy includes the use of openable windows for natural ventilation, MVHR and glazing with a g-value of 0.45.

The proposed overheating mitigation measures are summarised in the table below:

Overheating Strategy	TM59 / Part O Compliance	Notes
▪ Glazing with a g-value of 0.45 ▪ Upper floor windows to have sill height at 1100mm or higher ▪ MVHR, 90% efficiency		Overheating strategy compliant

The window openings have been taken from architectural drawings and applied to the model, with each opening assumed to open to the maximum opening angle (as permitted to by Approved Document K). It should be ensured that the Part O guarding requirement of 1100mm is achieved for all windows above ground floor. The lower ground floor glazed patio doors have been modelled with 100mm restrictors for security reasons. The living room roof lights have been modelled with being able to open for ventilation.

All windows have a 100% openable area while there are no assumed acoustical limitations to windows being opened during the day. In accordance with Part O methodology, the lower ground floor windows are assumed to be restricted during the night unless they are made secure.

3 Part O: Dynamic Thermal Modelling Method

In order to demonstrate compliance with the requirements settled by the requirement O1 of the Approved document Part O, this report has used the Dynamic thermal modelling method approved by the aforementioned document.

To demonstrate compliance using the dynamic thermal modelling method, all of the following have been followed:

- a) CIBSE TM59 methodology for predicting overheating risk
- b) The limits on the use of CIBSE TM59 methodology set out below
- c) The acceptable strategies for reducing overheating risk

Limits on CIBSE's TM59 modelling

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 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 of easily accessible room is unoccupied, both of the following apply:

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:

1.1 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).

1.2 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.

1.3 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

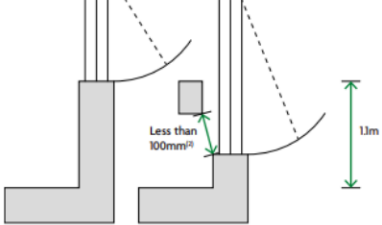
1.4 Protection from Falling

- **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.

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.

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

4 CIBSE TM59 Assessment Criteria

This report includes only occupied spaces such as Kitchens/Living Room and Bedrooms. The analysis has been based on CIBSE Technical Memorandum 59 (TM59) 'Design methodology for the assessment of overheating risk in homes', that states:

Compliance is based on passing both of the following criteria:

- a) For living rooms, kitchens and bedrooms: the number of hours during which DT is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 percent of occupied hours. (CIBSE TM52 Criterion 1: Hours of exceedance).**

b) For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26 °C for more than 1% of annual hours. (Note: 1% of the annual hours between 22:00 and 07:00 for bedrooms is 32 hours, so 33 or more hours above 26 °C will be recorded as a fail).

5 The Model

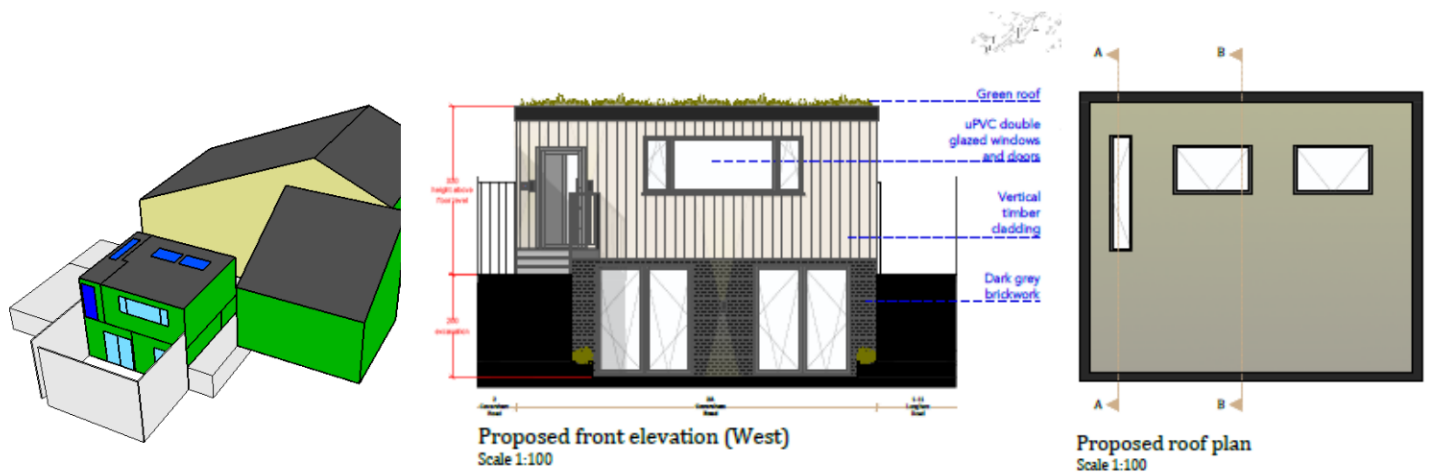
The building has been modelled using DesignBuilder Energyplus software. The software complies with CIBSE Application Manual AM11: 1998 Building Energy and Environmental Modelling and provides a full dynamic simulation of thermal conditions in the building.

Geometry

A three-dimensional analysis model has been generated for the proposed development. The model was developed using drawn information supplied by Aygul Boyraz Architecture.

As with any modelling exercise, some approximations have been made, but care has been taken to ensure the scale and internal dimensions of the model are as close as practicable to the design drawings, and that glazing areas are as accurately represented as the provided information allows.

Figure 02 - Thermal Model image and architectural drawings



Site Location and Climate Data

The CIBSE DSY weather file for London Heathrow (DSY1_2020_High50) has been selected as this is the most appropriate weather file for the site due to the suburban area.

The weather file contains hourly data for air temperatures (wet bulb and dry bulb), wind speed and direction, atmospheric pressure, solar irradiation and cloud cover.

DSY (Design Summer Year) is the industry standard weather file for use in overheating assessments. It should be noted that the current DSY was used, and future weather files based on various predicted climate change scenarios are available. Usage of these future weather files would result in higher predicted internal temperatures than reported here as the climate is predicted to encounter more prolonged warm spells and higher peak temperatures as time progresses.

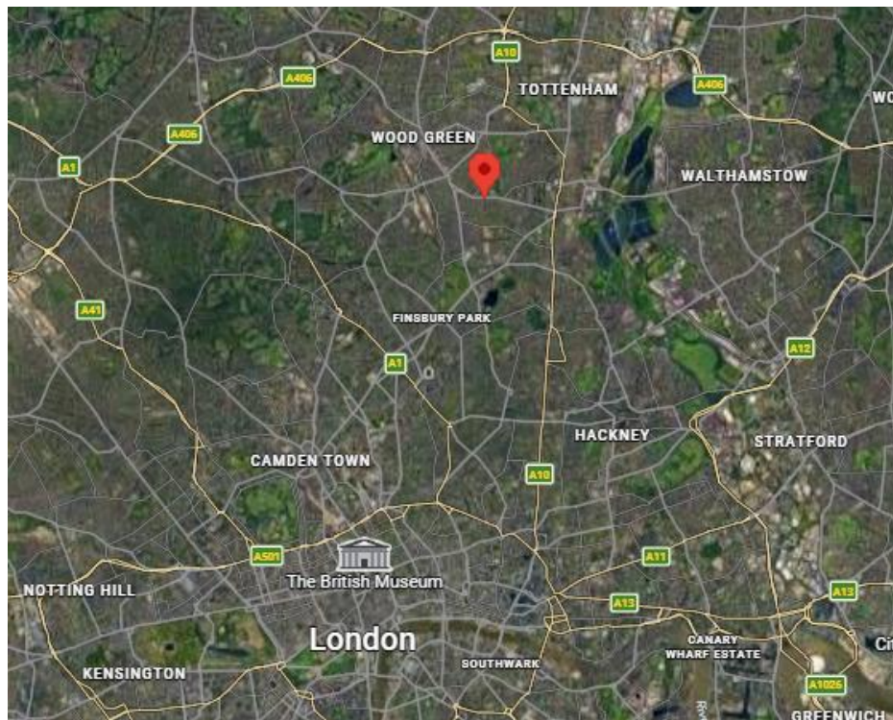


Figure 03 - Site Location

The site is located in north London.

Building Construction and U-Values

Drawings have been provided by the architect which were used to create the thermal model.

Table 1 shows the construction U-values and air infiltration used in the thermal model. These values have been taken from the SAP (Part L) Calculations.

Table 01: *U Values applied to the Dynamic Simulation Model*

Element	Modelled U Value (W/m ² K)
External Wall	0.16
Flat roof	0.11
Ground Floor	0.10
Glazing	1.2
Doors	1.1
Air Leakage (m ³ (h.m ²) @ 50Pa	3.0
Glazing g Value (whole window value)	45%

Internal Gains

The internal heat gains and operating profiles that are applied to each occupied space have been taken from the prescriptive templates outlined in CIBSE TM59 (Design methodology for the assessment of overheating risk in homes).

Extras

Although fencing is not normally modelled for Part O, the garden fencing has been modelled due to being required for privacy of the occupants. Due to the lower floor level this provides some shading to the bedrooms.

Mechanical Ventilation

Mechanical ventilation in the form of MVHR is proposed to provide fresh air to the dwelling.

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 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 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 MVHR should be designed to ensure that the minimum rates in Part F are met.

It is assumed that the MVHR unit will be capable of boosting up to 20 l/s in each occupied room during peak summer periods.

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.*

6 Results

A full set of TM59 results can be seen in Appendix A of this report.

The proposed overheating mitigation strategy is shown below:

Overheating Strategy	TM59 / Part O Compliance	Notes
▪ Glazing with a g-value of 0.45 ▪ Upper floor windows can open fully and will have sill heights at 1100mm or more ▪ Openable roof lights over living room ▪ MVHR	☒	Overheating strategy compliant

7 Summary

The TM59 assessment has confirmed that the proposed residential dwellings at 2 Caversham Road, London, N15 complies with Part O of the Building Regulations and meets Hackney Council's planning requirements.

A baseline scenario has been modelled based on the current design, incorporating mechanical ventilation with heat recovery and glazing with a g-value of 0.45 to reduce solar gains. The openable roof lights have been modelled for the living area to further mitigate overheating.

To satisfy Part O guarding requirements, windows located at upper floor level should either be positioned at least 1100mm above finished floor level (FFL) or fitted with suitable guarding. This ensures windows can be fully opened without posing a risk of falling.

Although blinds and curtains are excluded from the overheating calculations under the regulations, occupants are advised to use them when direct sunlight enters living spaces. This can help reduce solar gains and maintain cooler indoor temperatures.

Although fencing is not normally modelled for Part O, the garden fencing has been modelled due to being required for privacy of the occupants. Due to the lower floor level this provides some shading to the bedrooms.

Effective mitigation of overheating will depend on occupant behaviour and awareness. Heat enters the home through solar radiation and warm external air. To minimise overheating, both sources should be managed, which may involve closing windows and curtains during the hottest periods.

If the indoor temperature is cooler than outside, windows should remain closed to prevent warm air from entering. Once indoor and outdoor temperatures equalise, windows can be opened for ventilation, while keeping curtains closed to continue limiting solar gains.

Appendix A: TM59 Results

Current design

CIBSE TM59

Export CSV

Naturally ventilated ☒ Mechanically ventilated ☐

Criteria for predominantly naturally ventilated homes

Block	Zone	Criterion A (%)	Criterion B (hr)	Pass/Fail
FIRSTFLOOR	LIVKITCHEN	2.97	N/A	Pass
GROUNDFOOR	BEDROOM1	0.65	26.50	Pass
GROUNDFOOR	BEDROOM2	0.49	25.50	Pass

Appendix B: Window opening schedule

Window Opening Schedule

The window opening schedule can be seen in the table below.

Assessed Space	Total Window Glazing (m ²)	Total Window Glazing that opens (m ²)	Glazing Opening Type	Total Floor Area (m ²)	Opening Schedule
Living room/Kitchen	3.84	1.32	Windows	28	Daytime Only
Living room/Kitchen	3.04	3.04	Roof lights	28	Daytime Only
Single Bedroom 1	3.4	100mm restriction	Windows	11	Daytime & Nighttime
Double Bedroom 2	3.4	100mm restriction	Windows	12	Daytime & Nighttime
Circulation and bathrooms	Assumed ground floor windows in unoccupied areas can be opened during the day and windows above the ground floor can be continuously opened.				

It is also assumed that internal doors are left open during the day.

Opening Schedules:

- Night Closed: Glazing can be opened between the hours of 08:00-23:00 but is shut out of these hours. The Part O document stipulates any window which can be easily accessed must be closed or secured resulting in a reduced opening area (such as ground floor doors/windows where openings may be vulnerable to intrusion by a casual or opportunistic burglar).
- Night Open: Glazing can be open 24/7 if necessary as these openings are not vulnerable (such as first floor and above windows etc).