L2 ENERGY Consulting
Established 2008

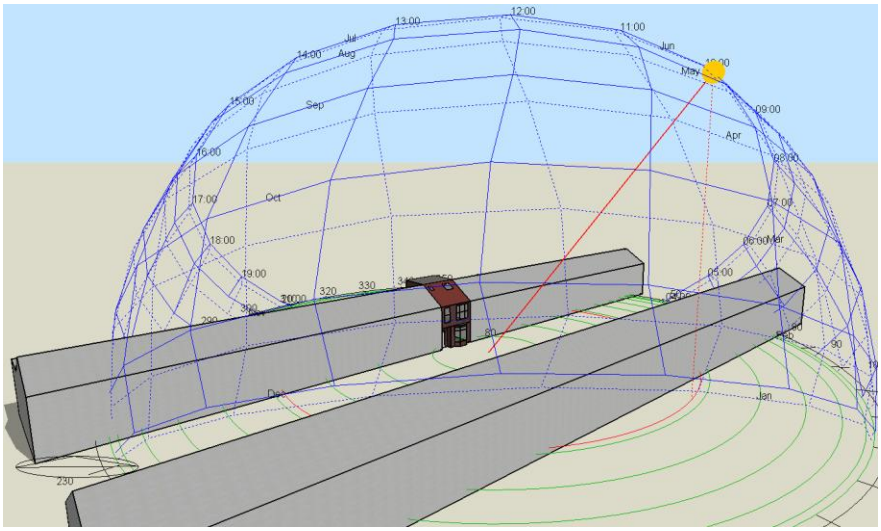
SUSTAINABILITY STATEMENT:
Overheating Risk & Energy Assessment

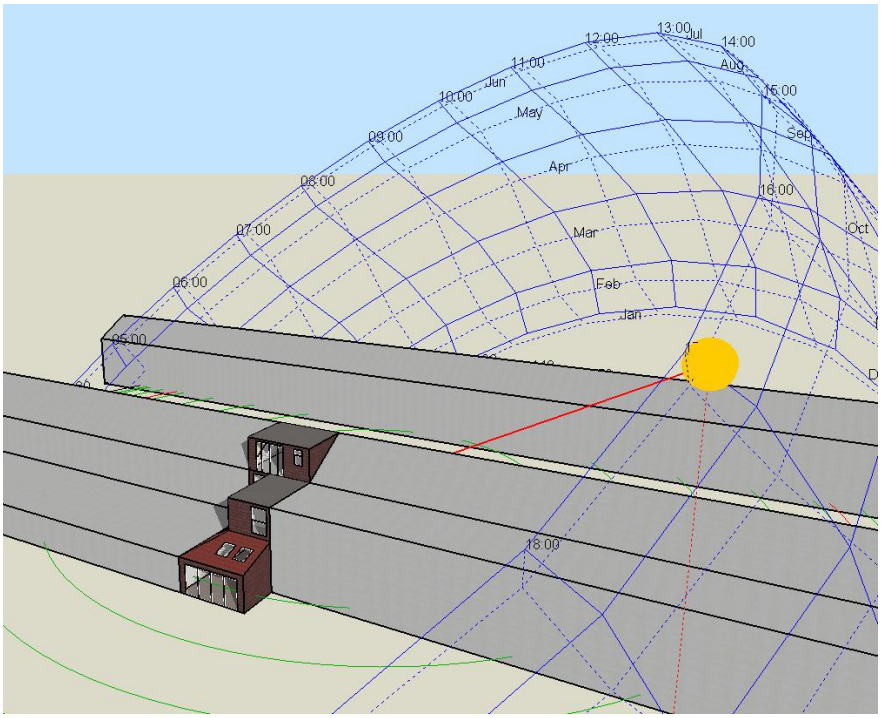
For

207 Hermitage Road
Harringay
London
N4 1NW

Date: 06 June 2025

207 Hermitage Road, Harringay





Modelled in DesignBuilder 7.3.1.003 Utilizing Energyplus Version 9.4.0.002 in accordance with CIBSE AM11 using guidance outlined in CIBSE TM52.

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EXECUTIVE SUMMARY

This report seeks to demonstrate whether the existing dwelling at 207 Hermitage Road, London meets the requirements of TM59: Design methodology for the assessment of overheating risk in homes. If the requirements of TM59 are shown not to be met, installing Air Conditioning is an option which may be sought providing the requirements of the Cooling Hierarchy within the London Plan are investigated and other methods of achieving acceptable comfort levels cannot be introduced as an alternative.

Furthermore, the report will also demonstrate that as a result of the proposed installation of air conditioning, energy use will be reduced along with carbon emissions from the property.

Compliance Criteria for Overheating

Homes that are predominantly naturally ventilated, including homes that have mechanical ventilation with heat recovery (mvhr), with good opportunities for natural ventilation in the summer should assess overheating using the adaptive method based on CIBSE TM52 (2013).

In order to allow the occupants to 'adapt', each habitable room needs operable windows with a minimum free area that satisfies the purge ventilation criteria set in Part F of the Building Regulations for England (NBS, 2010), i.e. the window opening area should be at least 1/20th of the floor area of the room (different conditions exist for windows with restricted openings, and the same requirement applies for external doors). Control of overheating may require accessible, secure, quiet ventilation with a significant openable area.

Homes that are predominantly mechanically ventilated because they have either no opportunity or extremely limited opportunities for opening windows (e.g. due to noise levels or air quality) should be assessed for overheating using the fixed temperature method based on CIBSE Guide A (2015a).

Criteria for homes predominantly naturally ventilated

Compliance is based on passing *both* of the following two criteria:

(*a*) *For living rooms, kitchens and bedrooms*: the number of hours during which D*T* is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent 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).

Criteria for homes predominantly mechanically ventilated

For homes with restricted window openings, the CIBSE fixed temperature test must be followed, i.e. all occupied rooms should not exceed an operative temperature of 26 ˚C for more than 3% of the annual occupied annual hours (CIBSE Guide A (2015a)).

Basis of Methodology for this Assessment

There is reasonable opportunity for natural ventilation in the summer within the property and therefore the adaptive method for homes predominately naturally ventilated is to be used.

Assessments are based upon occupied hours between May and September, this equates to 3,672 hours per year for bedrooms and 1,989 hours per year for Living rooms.

Inclusion of Window Blinds & Ceiling Fans

At the request of the Local Authority internal window blinds have been added to the dynamic thermal model to establish their effect on the results.

Ceiling fans cannot be added to the assessment and are not considered within TM59, these will only have the effect of moving warm air around the room in any case. The MVHR unit which is installed provides adequate air movement and exchange in order to give some cooling effect.

MVHR with Air Tempering

The installed MVHR system installed provides external air tempering by its very nature, it will exchange warm internal air and exchange it for cooler external air.

If the incoming air was to be mechanically tempered, this would require an outside air conditioning unit to run through an internal coil within the MVHR unit, this would constitute by very nature an air conditioning system.

Results Overview

The results obtained from the thermal model demonstrate that all rooms of the property do not pass the requirements of TM59, it can be seen that this is exacerbated at second and third floor levels, indicating significant overheating will occur.

CALCULATION PARAMETERS

U-Values

External Walls (Original)	1.77 W/m²K
New Walls 2017	0.28 W/m²K
Roofs, well insulated to current regulations	0.16 W/m²K
Ground Floor	0.58 W/m²K
Windows, Rooflights & Glazed Doors	2.20 W/m²K

Glazing

Windows and glazed doors with an anticipated g-value of 0.50 and light transmission of 0.80 has been allowed for.

Room and Glazing Sizes

Measured during full site survey

Thermal Mass

Medium-weight construction to ground and first floor elements.
Timber joist upper floors, mainly solid brick internal partitioning, with timber studs at second floor level.

Ventilation Strategy

Openable windows available to all occupied areas however windows are restricted to 100mm for safety reasons. Upper floor windows to the rear have been modelled as open at night as these appear secure. Front windows modelled as open during the day and closed during the night due to noise. Free Areas calculated accordingly.

All ground floor windows modelled as closed from 11pm.

In accordance with TM59 windows to be open when the internal dry bulb temperature exceeds 22°C and the room is occupied.

Local mechanical extract is provided to wet areas.

Lighting

In accordance with TM59, lighting gains are set at 2 W/m² and on between 6pm and 11pm.

Air Permeability

Air permeability set at 15.0 m³/(h.m²) at 50 Pa.

Internal Gains

In accordance with TM59

Room Ref:	Occupancy Gains	Lighting Gains W/m²	Equipment Gains W/m²
Bedrooms	2*	2.0	80W Peak Load*
Kitchen	4*	2.0	450W Peak Load*
Living	4*	2.0	150W Peak Load*

*Adjusted in accordance with TM59 for differing time periods of the day.

Occupied Times

In accordance with TM59

Room Ref	Occupancy
Single Bedrooms	1 person at 70% gains from 11pm to 8am 1 person at full gains from 8am to 11pm
Double Bedrooms	2 people at 70% gains from 11pm to 8am 2 people at full gains from 8am to 9am and from 10pm to 11pm 1 person at full gain in the bedroom from 9am to 10pm
Living	4 people at 5% gains from 9 am to 10 pm; room is unoccupied for the rest of the day
Kitchen	4 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day

Weather File

London Central DSY1 2020s, high emissions, 50% percentile scenario in accordance with TM59

OVERHEATING

Compliance is based on passing *both* of the following two criteria:

(*a*) *For living rooms, kitchens and bedrooms*: the number of hours during which D*T* is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 per cent 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).

Results of the above calculations can be viewed below and can be seen that all occupied space fails the required benchmark of CIBSE TM59.

Results without Window Blinds

Dwelling	Level	Zone	Criterion A (%)	Criterion B (hr)	Pass / Fail
207 Hermitage Road	Grd Flr	Kitchen Diner	3.09	N/A	Fail
	Grd Flr	Lounge	4.51	N/A	Fail
	First Flr	Double Bedroom	17.58	91.50	Fail
	First Flr	Single Bedroom 1	6.20	28.17	Fail
	First Flr	Single Bedroom 2	6.73	19.67	Fail
	Second Flr	Double Bedroom	6.47	12.17	Fail

Results with Window Blinds

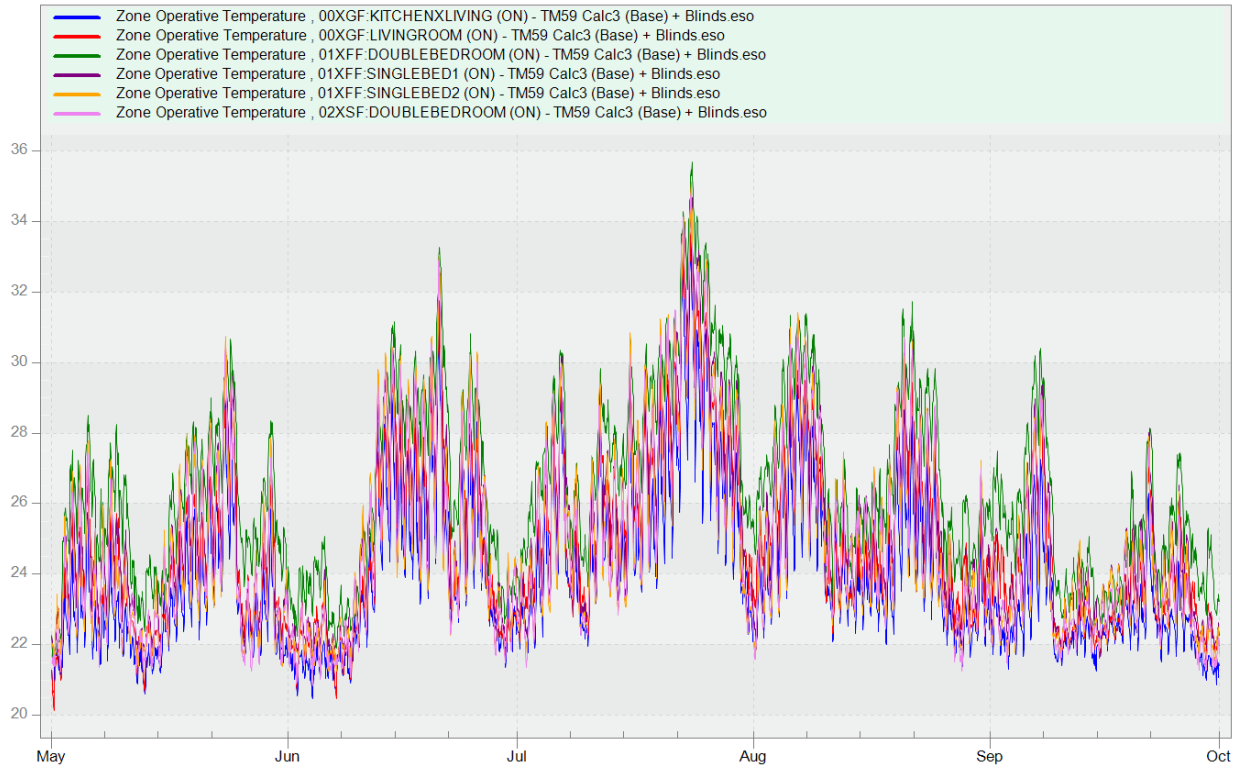
Dwelling	Level	Zone	Criterion A (%)	Criterion B (hr)	Pass / Fail
207 Hermitage Road	Grd Flr	Kitchen Diner	1.81	N/A	Fail
	Grd Flr	Lounge	4.42	N/A	Fail
	First Flr	Double Bedroom	17.86	96.33	Fail
	First Flr	Single Bedroom 1	6.08	28.50	Fail
	First Flr	Single Bedroom 2	5.94	18.83	Fail
	Second Flr	Double Bedroom	6.44	12.00	Fail

Results with Window Blinds + MVHR

Dwelling	Level	Zone	Criterion A (%)	Criterion B (hr)	Pass / Fail
207 Hermitage Road	Grd Flr	Kitchen Diner	1.55	N/A	Pass
	Grd Flr	Lounge	2.99	N/A	Pass
	First Flr	Double Bedroom	8.09	58.17	Fail
	First Flr	Single Bedroom 1	3.14	19.17	Fail
	First Flr	Single Bedroom 2	4.14	15.17	Fail
	Second Flr	Double Bedroom	4.09	8.50	Fail

Indoor Temperature Distribution

01 May – 30 September



COOLING HIERARCHY

In accordance with the London Plan air conditioning will only be permitted where dynamic thermal modelling demonstrates there is a clear need for it after all of the preferred measures are incorporated in line with the cooling hierarchy.

The cooling hierarchy includes:

- Minimise internal heat generation through energy efficient design;
- Reduce the amount of heat entering a building in summer through orientation, shading, albedo, fenestration, insulation and green roofs and walls;
- Manage the heat within the building through exposed internal mass and high ceilings;
- Passive ventilation;
- Mechanical ventilation;
- Active cooling.

As the property has been completely refurbished in the last 8 years, much of the thermal quality has been improved to regulations at the time of refurbishment in 2017. Orientation and window sizes could not have been changed as the refurbishment needed to be in keeping with the surrounding buildings. Window film has been added to provide a reasonably low g-value in an attempt to reduce solar gains.

Windows allow adequate passive ventilation with openable windows at all levels, however some of these need to be restricted for safety reasons.

Passive shading could not be introduced without changing the look of the existing building or at great expense. Internal blinds have been added to the thermal model, which is representative of how the occupant uses the building.

A Mechanical Ventilation Heat Recovery (MVHR) system could be added throughout. This could include summertime bypass to allow cool outside air to bypass the heat recovery unit to prevent incoming air being pre-heated by internal warm air. This has been investigated within the Dynamic Thermal Model using Approved Document F: Ventilation for guidance, this states a ventilation rate for a continuous ventilation system should be a minimum of 37 l/s, we have allowed for 40 l/s and whilst improvement has been demonstrated, the results do not Pass the requirements of TM59 in its totality.

The results show that all areas cannot be passed even when following the cooling hierarchy, on this basis Active Cooling should be an allowable consideration without refusal.

ENERGY REDUCTION

This section will provide an overview of the energy reduction and CO2 emission reduction achieved by the installation of air conditioning in lieu of using the existing modern gas fired boiler (Vaillant ecoTEC plus).

Results have been created using Energyplus Dynamic Thermal Modelling as this provides the most accurate way to perform such calculations.

Energy Use

	Pre AC KWh/year	Post AC KWh/year
Space heating	5,968.94	3,205.70
Water heating	4,132.24	4,132.24
Space cooling	-	397.08
Extract Fans	641.64	641.64
Lighting	520.62	520.62
	11,263.44	8,897.28

The above results represent a 21% reduction in energy use as a result of installing Air Conditioning to select rooms, by using a significantly more energy efficient solution to heat those spaces. Other areas will continue to be heated via gas.

It can also be seen that the energy used from comfort cooling is less than 4.5%.

CO2 Emissions

	Pre AC	Post AC
Total Kg CO2/year	2,282.95	1,687.94

The above results represent an 26% reduction in CO2 emissions as a result of the proposed installation of Air Conditioning to select areas.

CONCLUSION

It can be viewed from the results within this report that overheating is expected within the building even following extensive refurbishment.

When considering the cooling hierarchy of the London Plan much of the recommendations to mitigate the need for mechanical cooling have been introduced with the exception of MVHR, however the calculations show that if this was installed, which is questionable whether this could be installed within this building without significant cost and disruption, the building will still overheat to some extent.

Furthermore, the report demonstrates that the inclusion of comfort cooling does not adversely affect energy use or CO2 emissions, In fact, energy use will be reduced by circa 21% with a 26% reduction in CO2 emissions. This is due to the efficiency of modern air conditioning systems and thus reduction in CO2 emissions against gas fired boilers.