

# **Overheating Study**

J3988 Shelton Street

Ref: J3988-B-RP-0001

Revision: 03

Status: S4

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**REVISION HISTORY**

Revision	Status	Date	Author	Reviewer	Approver
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01	S4 – For information	07.04.2022	AE	PD	PD
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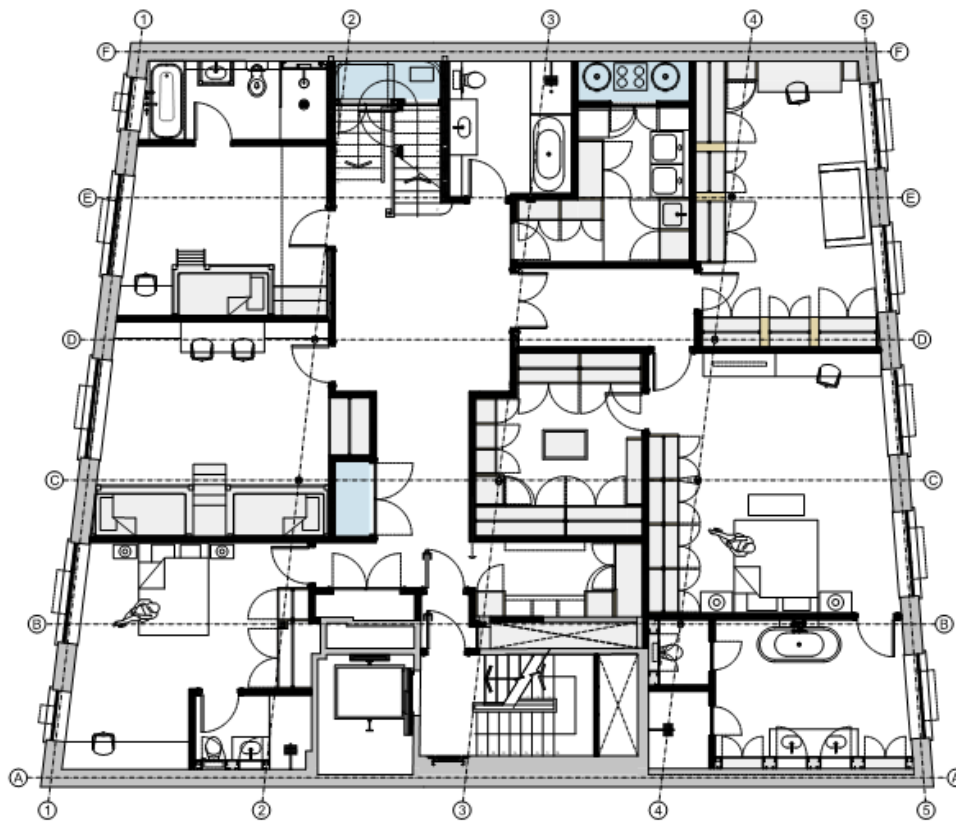
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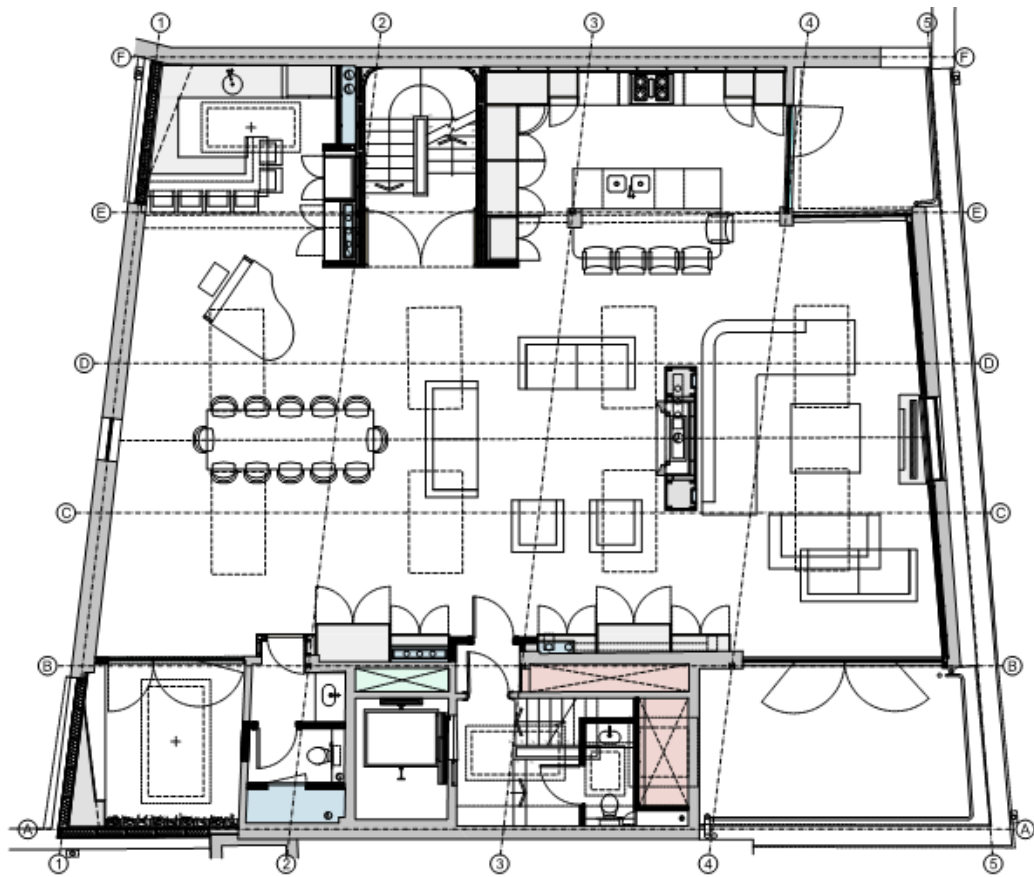
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## I. INTRODUCTION

This report summarizes the findings from the assessment of overheating risk based on CIBSE thermal comfort **metric TM59: Design methodology for the assessment of overheating risk in homes** for the development of 25 Shelton Street. Testing has been carried out in support of Planning Application ref PP-10440208v1. This report demonstrates how following the steps of the cooling hierarchy of London Plan Policy SI.4, as outlined in the previously issued report *Proposed Overheating and Cooling Statement* (02.03.2022), has been tested using a dynamic thermal model as evidence for the need of mechanical cooling within the development. As results show, having followed the steps of the cooling hierarchy, mechanical cooling is still required in order to ensure all habitable rooms meet TM59 criteria. It is therefore proposed to utilise the highly efficient Mitsubishi PUMY-P200YKM2 air source heat pumps, selected to decarbonise the existing heating system, in cooling mode during summer months. Testing has been carried out using TAS modelling software.

The project consists of the refurbishment of a two-storey flat located in Covent Garden, London. The 5<sup>th</sup> floor houses the bedrooms, which faces south east onto Shelton Street and north west onto an internal courtyard. On the 6<sup>th</sup> floor is the open-plan living area.



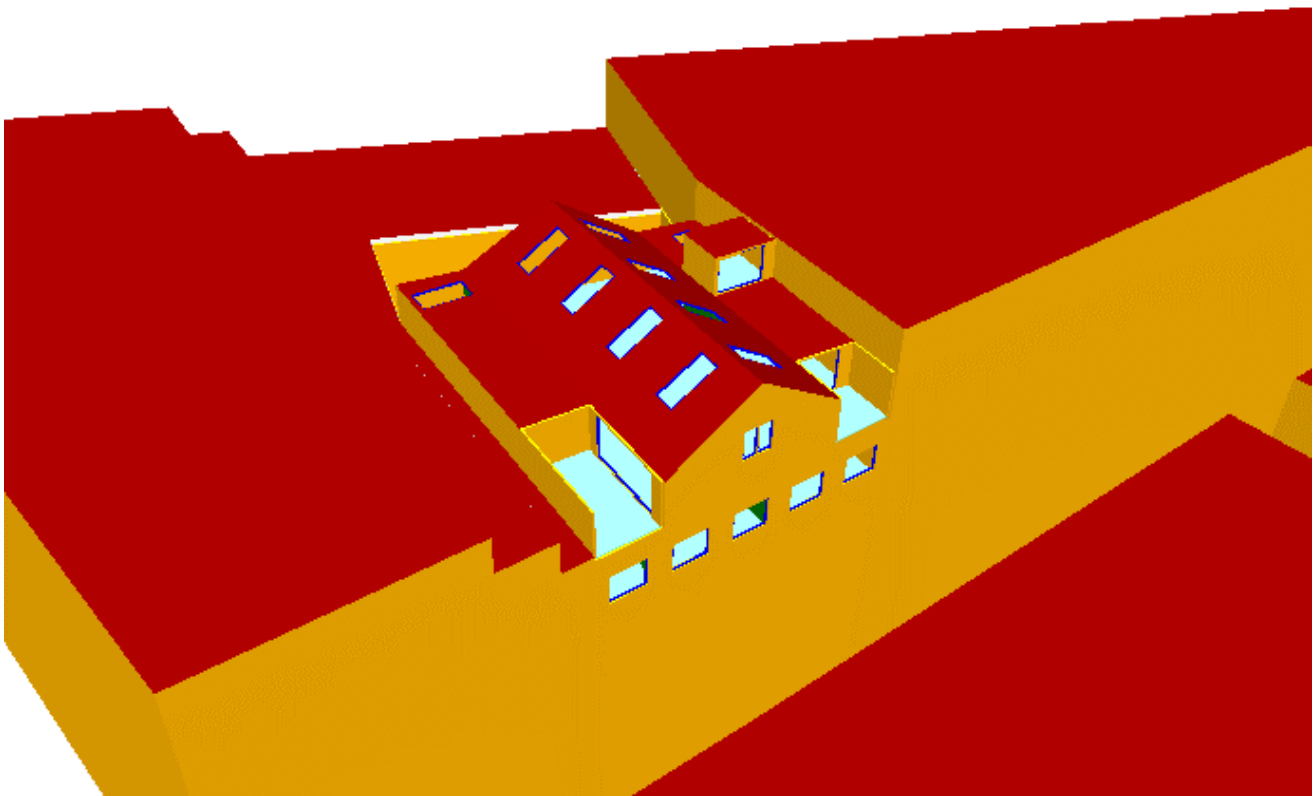


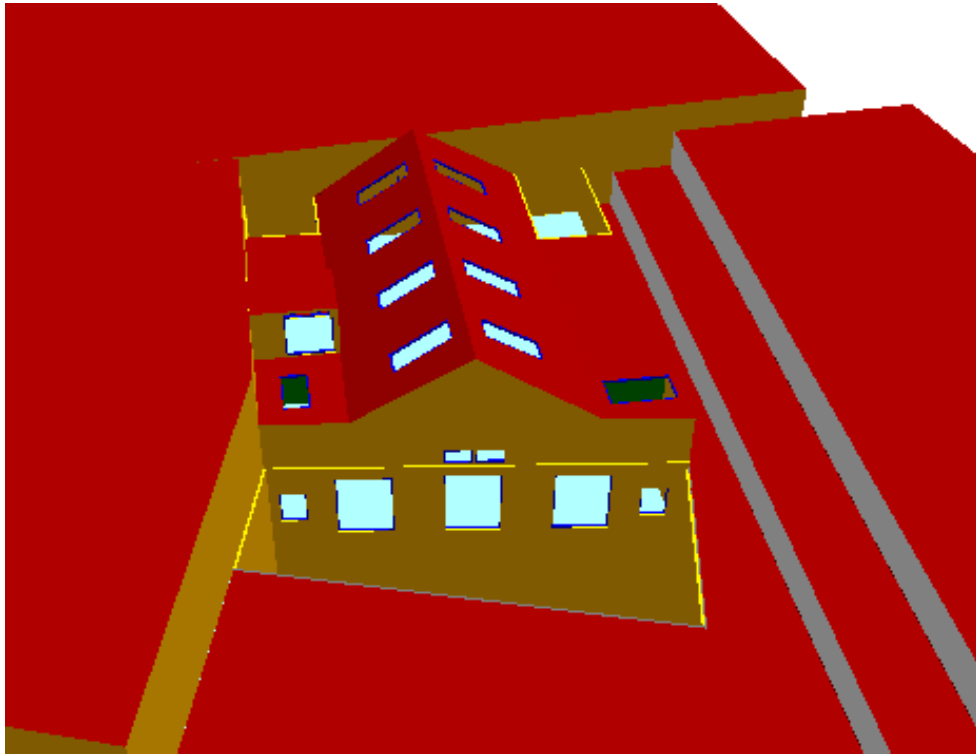
## 2. MODEL ASSUPTIONS

Layout and dimensions along with thermal fabric performance have been based on drawings and information received from theme2architects. External shading, such as overhangs, and surrounding architecture that will impact solar exposure have been included in the model. It is assumed with the refurbishment works carried out to improve the thermal fabric, no thermal mass is present within the development. Party walls and floors to neighbouring properties have been modelled as having an adiabatic interface meaning there is no heat transfer at these surfaces.

Building Element	U-value (W/m <sup>2</sup> K)
External Wall	0.75
Roof	0.18

Glazing	U <sub>g</sub> -value (W/m <sup>2</sup> K)	G-value	LT-value
Double Glaze Windows	1.496	0.66	0.78
Rooflight	1.496	0.66	0.78





### 3. OVERHEATING

#### 3.1. Relevant Policy

The planning requirements for developments in London to prevent overheating are set out in the London Plan. The London Plan states that residential developments should be assessed based **CIBSE thermal comfort metric TM59: Design methodology for the assessment of overheating risk in homes**. Compliance is based on passing both of the following two criteria:

1. The number of hours during which  $\Delta T$  of indoor air temperature to outdoor is greater than or equal to one degree (K) during the period of May to September shall not exceed 3% of occupied hours.
2. 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.

#### 3.2. Climate Data

**TM49: Design Summer Years for London**, a predictive weather set based on an urban environment within London, adjusted for climate change has been used to model the selected apartments and investigate their future performance. The design summer years (DSY) for 2020 at a scenario of high emissions rate and 50th percentile have been used as the basis for testing. In certain cases. There are three weather files that represent different types of summers summarised as follows;

- DSY1: Moderately warm summer
- DSY2: Intense single warm spell
- DSY3: Long period of persistent warmth

#### 3.3. Overheating Analysis

The development needs to comply with CIBSE TM59 criteria for DSY1 2020 50th percentile high emissions scenario. DSY2 and DSY3 for the same year and scenario have additionally been tested in order to determine their overheating resilience for a variety of summer heatwave types. The living/kitchen, reading room and bedrooms will need to show compliance by achieving Criteria 1 as previously stated. Additionally, the bedrooms will need to achieve Criteria 2.

Occupancy and internal gains for the rooms tested have been based on TM59 profiles.

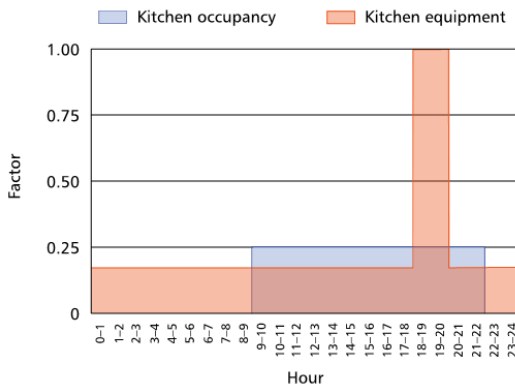
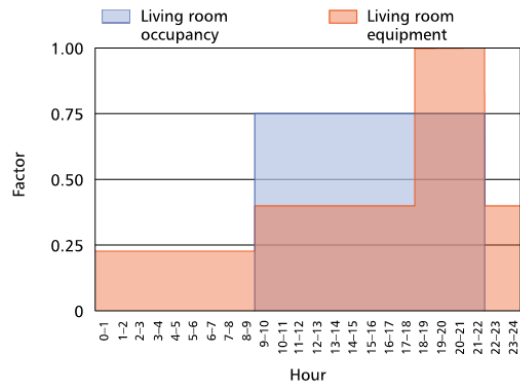
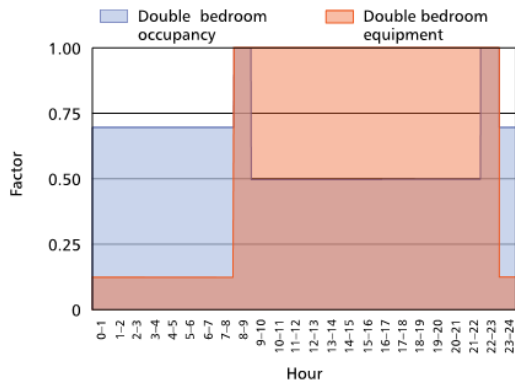
All bedrooms are modelled as double bedrooms. They are occupied by 2 people during night-time hours, during the day they are occupied by one individual. Occupancy gains are at 70% during sleeping hours due to the lower level of physical activity.

The open plan living/kitchen area has been modelled as a 5-bed apartment living/kitchen. This area has a maximum equipment gain of 450 W. The space is occupied by 5 people between 9am and 10pm.

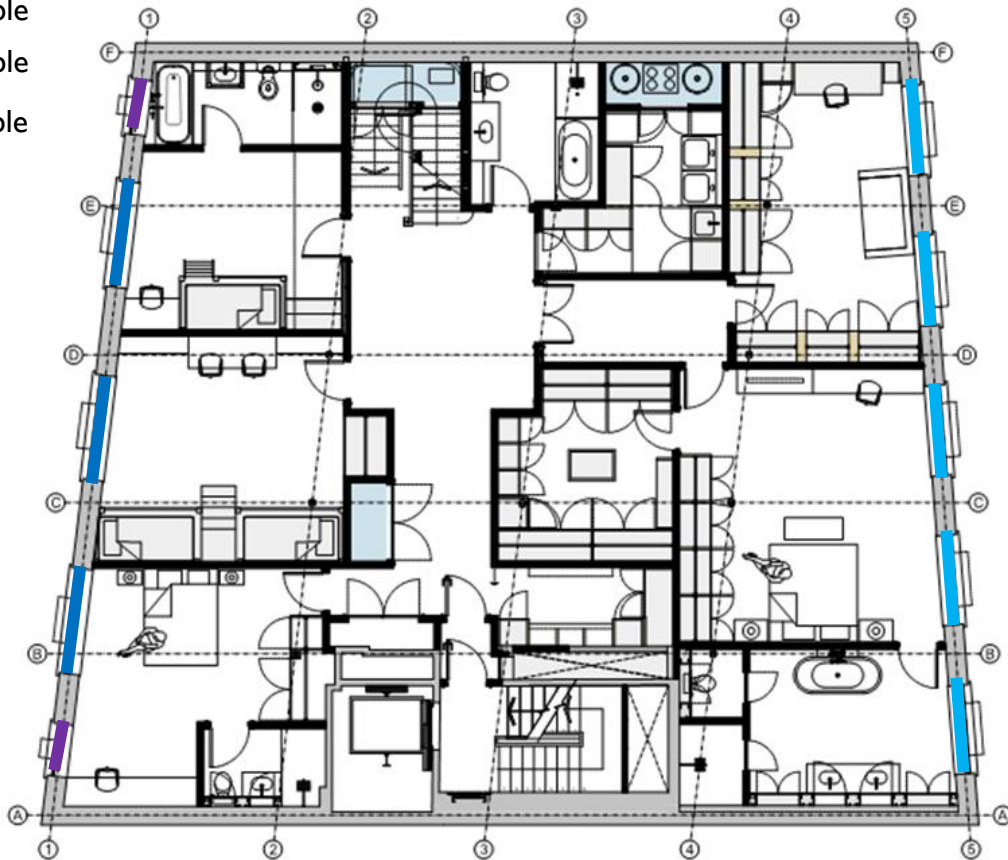
The reading room has been modelled as occupied by 1 person throughout the day with a low and continuous equipment gain as seen in bedrooms.

Glazing opening areas have been based on architectural drawings along with restrictions based on external noise and high drafts that would be caused by fully opening windows, especially at 6<sup>th</sup> floor. These opening equates to approximate openable area percentages on each elevation as shown in the figure below. The rooflights have been modelled as 15% openable. The windows have been modelled as being openable only during occupied hours for security reasons and when the internal temperature is above 22° C. The windows have been modelled as closed during night-time due to acoustic restrictions.

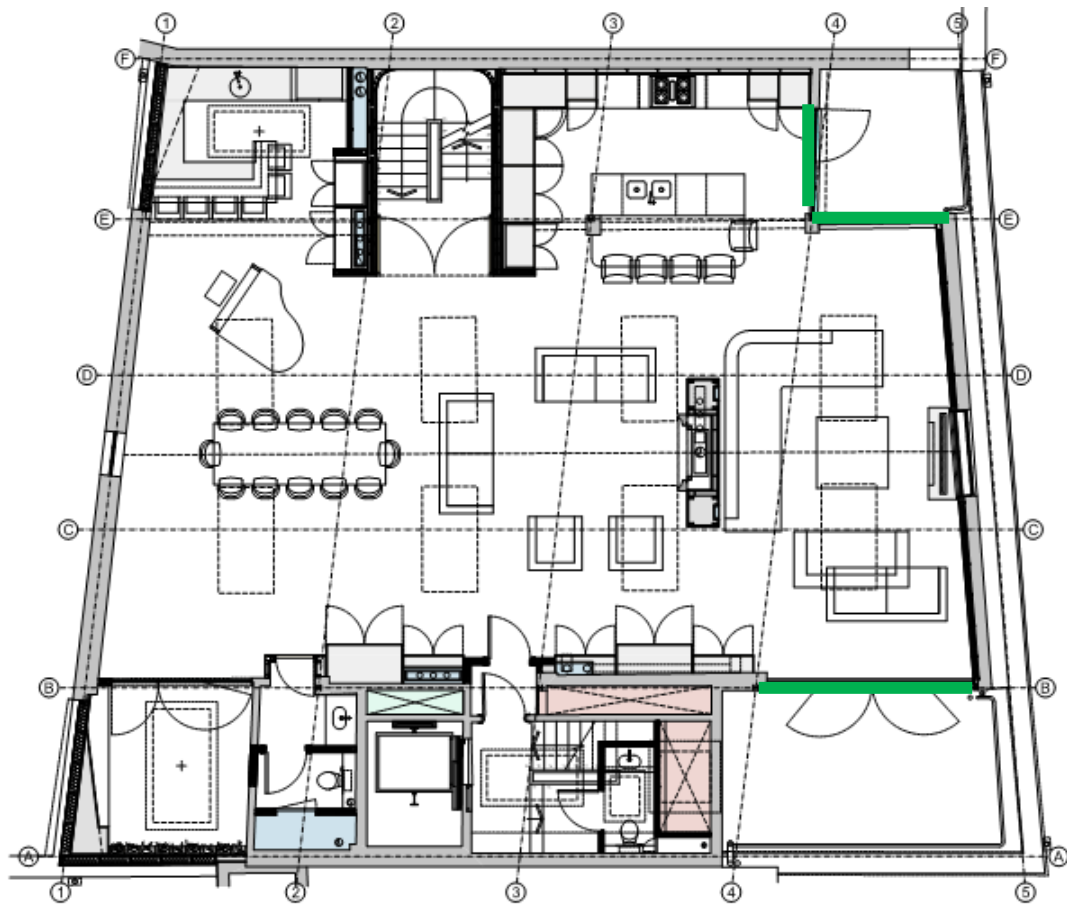




- 40% Openable
- 24% Openable
- 15% Openable



■ 15% Openable



#### **4. COOLING HIERARCHY**

The development has been designed in line with the cooling hierarchy outlined in Policy SI4 Managing heat risk in the New London Plan. The following measures have been taken at each stage of the hierarchy in order to reduce the demand for cooling. Features of the site that will affect vulnerability to overheating have also been identified here.

##### **Minimising Internal Heat Gains**

Stage one of the Cooling Hierarchy is to minimise internal heat generation through energy efficient design.

Heat distribution infrastructure will be designed to minimise pipe lengths, ensuring pipework is well insulated and that pipe configurations minimise heat loss. Good daylighting and high efficiency light fittings with controls will also help to reduce excess heat gains from artificial lighting.

##### **Reducing Heat Entering the Building**

Due to it being an existing building the massing and location of glazing is already set. Windows will be improved and thermal fabric will be upgraded which will help reduce heat entering the building. Shading elements have been provided to the terraces limiting solar gains. The windows and rooflights shall make use of solar control and blinds in order to further reduce solar gains wherever possible.

##### **Passive Ventilation**

All habitable rooms have openable windows. The open plan living area will allow sufficient natural cross ventilation during occupied hours. The bedrooms are all single aspect units which will limit the effectiveness of natural ventilation. As previously stated, security and acoustic requirements will limit the reliance on natural ventilation. Bedrooms will not be able to keep windows open at night due to noise disturbance. The windows to the 6<sup>th</sup> floor living areas will need to remain closed during unoccupied hours for security and insurance reasons. Windows on the 6<sup>th</sup> floor can only be partially opened in order to avoid cross drafts within the space.

##### **Mechanical Ventilation**

The MVHR is to employ a summer bypass mode in order to maintain a comfortable internal environment.

##### **Active Cooling**

Due to the nature of the building and its use, the measures taken in the previous steps will not fully negate the need for active cooling as results show. It is therefore proposed to allow for mechanical cooling using the highly efficient Mitsubishi PUMY-P200YKM2 air source heat pumps in summer months.

## 5. RESULTS

As shown, the base model was tested for DSYI 2020 weather scenarios. All living areas need to achieve an exceeded hours value of 59 or below, while bedrooms need to be below 110 hours to meet Criteria 1. The bedrooms need to additionally not exceed 32 hours for Criteria 2.

As can be seen, with the proposed design all rooms currently fail to achieve TM59 overheating criteria. This can be explained by the development's exposed setting and lack of thermal mass. The bedroom windows have relatively small openable areas and receive a high degree of afternoon sun. The rooms cannot utilise natural ventilation during nighttime hours which explain their high rate of failure.

	DSYI 2020	
	Criteria 1	Criteria 2
	Hours Exceeded	Hours Exceeded
Living/Kitchen	257	-
Reading Room	445	-
Bedroom 1	580	663
Bedroom 2	402	627
Bedroom 3	406	623
Bedroom 4	407	591
Study Bedroom 5	273	-

The spaces have been further tested in accordance with the cooling hierarchy in order to determine if TM59 criteria can be met via passive measures alone. Glazing was identified as the one area for improvement in order to limit heat entering the building. The table below shows the impact of internal blinds and improving the glazing g-value to 0.45. As seen, proposed improvements can help reduce overheating risk but not fully negate it due restrictions of window opening areas and schedule.

	Baseline		Internal Blinds		g-value 0.45		g-value 0.45 + Internal Blinds	
	Criteria 1	Criteria 2	Criteria 1	Criteria 2	Criteria 1	Criteria 2	Criteria 1	Criteria 2
	Hours Exceeded	Hours Exceeded	Hours Exceeded	Hours Exceeded	Hours Exceeded	Hours Exceeded	Hours Exceeded	Hours Exceeded
Living/Kitchen	257	-	94	-	150	-	61	-
Reading Room	445	-	299	-	282	-	195	-
Bedroom 1	580	663	196	432	273	540	118	362
Bedroom 2	402	627	156	461	218	557	85	395
Bedroom 3	406	623	149	431	219	527	80	350
Bedroom 4	407	591	152	372	233	462	80	247
Study Bedroom 5	273	-	78	-	120	-	50	-

The results show that, even with improvements to glazing and solar control, all rooms, except for the marginally passing study, fails TM59 criteria. It is worth noting that if this room were to be utilised as a bedroom, it would similarly to the other bedrooms not be compliant. Mechanical cooling will have to be provided to fully mitigate overheating risk. Further testing was carried out considering DSY2 and DSY3, simulating different and more severe types of summers. Results show that even with passive measure in line with the cooling hierarchy, all habitable rooms will face issues with overheating in more extreme summer heatwave scenarios. Mechanical cooling will be a method of mitigating current overheating risk while also future proofing the development against rising temperatures and a warming climate. It is also believed that due to the adiabatic interface between the flat and floors below, the heat seeping up to the 6<sup>th</sup> floor is underestimated in simulations. Accounts from current residents also confirm that there is large overheating risk currently in the building. Full results of the tests performed can be found in the Appendix.

	DSY1 g-value 0.3 + Internal Blinds		DSY2 g-value 0.3 + Internal Blinds		DSY3 g-value 0.3 + Internal Blinds	
	Criteria 1	Criteria 2	Criteria 1	Criteria 2	Criteria 1	Criteria 2
	Hours Exceeded	Hours Exceeded	Hours Exceeded	Hours Exceeded	Hours Exceeded	Hours Exceeded
Living/Kitchen	61	-	122	-	156	-
Reading Room	195	-	227	-	248	-
Bedroom 1	118	362	221	372	305	426
Bedroom 2	85	395	196	422	302	421
Bedroom 3	80	350	192	388	298	399
Bedroom 4	80	247	187	334	268	336
Study Bedroom 5	50	-	109	-	152	-

## **6. SUMMARY**

Extensive testing has given a clear indication of each room's susceptibility to overheating. Due to the area of vertical glazing and rooflights, all areas are currently at risk of overheating.

Following the energy hierarchy, improvements have been considered which will help reduce overheating risk. However, the results show that with the potential improvements available, all rooms will still fail TM59 criteria. This is partly due the limitations of reliance on natural ventilation due to security and external noise risks. As also previously mentioned, it is believed that the overheating model does not account for heat rising up the building from apartments below and therefore underestimates the overheating risk in the living areas on the 6<sup>th</sup> floor and overheating risk would in reality be worse than what the already failing model is demonstrating.

Based on TM59 results, it is shown that all bedrooms will require mechanical cooling in order to ensure a comfortable indoor environment. Improving the g-value of glazing and using internal blinds will help reduce overheating but all bedrooms fail Criteria 2 by a significant degree as night-time ventilation cannot be utilised. The study is the only habitable room which can pass but it is worth noting that if this room were to be utilised as a bedroom it would fail for the same reasons as the other bedrooms. Overheating risk cannot be mitigated through passive measures for the upper floor living areas through passive measures alone. This is further highlighted when considering more onerous weather scenarios.

It is therefore necessary to allow for mechanical cooling in all habitable rooms to achieve a comfortable indoor environment and ensure the spaces will be able to cope with future summer temperatures. Cooling will be provided for the limited summer periods when it is needed using the proposed and highly efficient air source heat pumps installed to provide low-carbon heating.

**7. APPENDIX**

**Overheating Results: Baseline**



# Domestic Overheating (CIBSE TM59)

## Project Details

**Building Designer File (.tbd):** J3988 - Shelton Street\_London\_LWC\_DSY1\_2020High50.tbd

**Simulation Results File (.tsd):** J3988 - Shelton Street\_London\_LWC\_DSY1\_2020High50.tsd

**Date:** 27 April 2022

**Building Category:** Category II

## Natural Ventilation Overheating Results

Zone Name	Room Use	Occupied Summer Hours	Max. Exceedable Hours	Criterion 1: #Hours Exceeding Comfort Range	Annual Night Occupied Hours for Bedroom	Max Exceedable Night Hours	Criterion 2: Number of Night Hours Exceeding 26 °C for Bedrooms.	Result
5th - Ante Room	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Bathroom 01	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Bathroom 03	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Bathroom 04	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Bedroom 01	Bedroom	3672	110	580	3285	32	663	Fail
5th - Bedroom 02	Bedroom	3672	110	402	3285	32	627	Fail
5th - Bedroom 03	Bedroom	3672	110	406	3285	32	623	Fail
5th - Bedroom 04	Bedroom	3672	110	407	3285	32	591	Fail
5th - Boot Room	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Dressing Room	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Entrance Hall	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Inner Hall	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Laundry Utility	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Plant	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Shower Room 02	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Study Bedroom 05	Other	1989	59	273	N/A	N/A	N/A	Fail
6th - Circulation	Other	0	0	0	N/A	N/A	N/A	Pass
6th - Living/Kitchen	Other	1989	59	257	N/A	N/A	N/A	Fail
6th - Plant	Other	0	0	0	N/A	N/A	N/A	Pass
6th - Reading Room	Other	1989	59	445	N/A	N/A	N/A	Fail
6th - Staircase 02	Other	0	0	0	N/A	N/A	N/A	Pass
6th - WC	Other	0	0	0	N/A	N/A	N/A	Pass
7th - Staircore 02	Other	0	0	0	N/A	N/A	N/A	Pass

\*Zone name's that have an orange coloured font are bedrooms which do not have 24/7 365 days a year occupancy, as per the TM59 guidance.

**Overheating Results: Internal Blinds**

# Domestic Overheating (CIBSE TM59)

## Project Details

**Building Designer File (.tbd):** J3988 - Shelton Street\_London\_LWC\_DSY1\_2020High50.tbd

**Simulation Results File (.tsd):** J3988 - Shelton Street\_London\_LWC\_DSY1\_2020High50.tsd

**Date:** 27 April 2022

**Building Category:** Category II

## Natural Ventilation Overheating Results

Zone Name	Room Use	Occupied Summer Hours	Max. Exceedable Hours	Criterion 1: #Hours Exceeding Comfort Range	Annual Night Occupied Hours for Bedroom	Max Exceedable Night Hours	Criterion 2: Number of Night Hours Exceeding 26 °C for Bedrooms.	Result
5th - Ante Room	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Bathroom 01	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Bathroom 03	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Bathroom 04	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Bedroom 01	Bedroom	3672	110	196	3285	32	432	Fail
5th - Bedroom 02	Bedroom	3672	110	156	3285	32	461	Fail
5th - Bedroom 03	Bedroom	3672	110	149	3285	32	431	Fail
5th - Bedroom 04	Bedroom	3672	110	152	3285	32	372	Fail
5th - Boot Room	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Dressing Room	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Entrance Hall	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Inner Hall	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Laundry Utility	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Plant	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Shower Room 02	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Study Bedroom 05	Other	1989	59	78	N/A	N/A	N/A	Fail
6th - Circulation	Other	0	0	0	N/A	N/A	N/A	Pass
6th - Living/Kitchen	Other	1989	59	94	N/A	N/A	N/A	Fail
6th - Plant	Other	0	0	0	N/A	N/A	N/A	Pass
6th - Reading Room	Other	1989	59	299	N/A	N/A	N/A	Fail
6th - Staircase 02	Other	0	0	0	N/A	N/A	N/A	Pass
6th - WC	Other	0	0	0	N/A	N/A	N/A	Pass
7th - Staircore 02	Other	0	0	0	N/A	N/A	N/A	Pass

\*Zone name's that have an orange coloured font are bedrooms which do not have 24/7 365 days a year occupancy, as per the TM59 guidance.

**Overheating Results: Improved g-value**

# Domestic Overheating (CIBSE TM59)

## Project Details

**Building Designer File (.tbd):** J3988 - Shelton Street\_London\_LWC\_DSY1\_2020High50.tbd

**Simulation Results File (.tsd):** J3988 - Shelton Street\_London\_LWC\_DSY1\_2020High50.tsd

**Date:** 27 April 2022

**Building Category:** Category II

## Natural Ventilation Overheating Results

Zone Name	Room Use	Occupied Summer Hours	Max. Exceedable Hours	Criterion 1: #Hours Exceeding Comfort Range	Annual Night Occupied Hours for Bedroom	Max Exceedable Night Hours	Criterion 2: Number of Night Hours Exceeding 26 °C for Bedrooms.	Result
5th - Ante Room	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Bathroom 01	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Bathroom 03	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Bathroom 04	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Bedroom 01	Bedroom	3672	110	273	3285	32	540	Fail
5th - Bedroom 02	Bedroom	3672	110	218	3285	32	557	Fail
5th - Bedroom 03	Bedroom	3672	110	219	3285	32	527	Fail
5th - Bedroom 04	Bedroom	3672	110	233	3285	32	462	Fail
5th - Boot Room	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Dressing Room	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Entrance Hall	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Inner Hall	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Laundry Utility	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Plant	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Shower Room 02	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Study Bedroom 05	Other	1989	59	120	N/A	N/A	N/A	Fail
6th - Circulation	Other	0	0	0	N/A	N/A	N/A	Pass
6th - Living/Kitchen	Other	1989	59	150	N/A	N/A	N/A	Fail
6th - Plant	Other	0	0	0	N/A	N/A	N/A	Pass
6th - Reading Room	Other	1989	59	282	N/A	N/A	N/A	Fail
6th - Staircase 02	Other	0	0	0	N/A	N/A	N/A	Pass
6th - WC	Other	0	0	0	N/A	N/A	N/A	Pass
7th - Staircore 02	Other	0	0	0	N/A	N/A	N/A	Pass

\*Zone name's that have an orange coloured font are bedrooms which do not have 24/7 365 days a year occupancy, as per the TM59 guidance.

**Overheating Results: Improved g-value + Internal Blinds**

# Domestic Overheating (CIBSE TM59)

## Project Details

**Building Designer File (.tbd):** J3988 - Shelton Street\_London\_LWC\_DSY1\_2020High50.tbd

**Simulation Results File (.tsd):** J3988 - Shelton Street\_London\_LWC\_DSY1\_2020High50.tsd

**Date:** 27 April 2022

**Building Category:** Category II

## Natural Ventilation Overheating Results

Zone Name	Room Use	Occupied Summer Hours	Max. Exceedable Hours	Criterion 1: #Hours Exceeding Comfort Range	Annual Night Occupied Hours for Bedroom	Max Exceedable Night Hours	Criterion 2: Number of Night Hours Exceeding 26 °C for Bedrooms.	Result
5th - Ante Room	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Bathroom 01	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Bathroom 03	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Bathroom 04	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Bedroom 01	Bedroom	3672	110	118	3285	32	362	Fail
5th - Bedroom 02	Bedroom	3672	110	85	3285	32	395	Fail
5th - Bedroom 03	Bedroom	3672	110	80	3285	32	350	Fail
5th - Bedroom 04	Bedroom	3672	110	80	3285	32	247	Fail
5th - Boot Room	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Dressing Room	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Entrance Hall	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Inner Hall	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Laundry Utility	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Plant	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Shower Room 02	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Study Bedroom 05	Other	1989	59	50	N/A	N/A	N/A	Pass
6th - Circulation	Other	0	0	0	N/A	N/A	N/A	Pass
6th - Living/Kitchen	Other	1989	59	61	N/A	N/A	N/A	Fail
6th - Plant	Other	0	0	0	N/A	N/A	N/A	Pass
6th - Reading Room	Other	1989	59	195	N/A	N/A	N/A	Fail
6th - Staircase 02	Other	0	0	0	N/A	N/A	N/A	Pass
6th - WC	Other	0	0	0	N/A	N/A	N/A	Pass
7th - Staircore 02	Other	0	0	0	N/A	N/A	N/A	Pass

\*Zone name's that have an orange coloured font are bedrooms which do not have 24/7 365 days a year occupancy, as per the TM59 guidance.

# Domestic Overheating (CIBSE TM59)

## Project Details

**Building Designer File (.tbd):** J3988 - Shelton Street\_London\_LWC\_DSY2\_2020High50.tbd

**Simulation Results File (.tsd):** J3988 - Shelton Street\_London\_LWC\_DSY2\_2020High50.tsd

**Date:** 27 April 2022

**Building Category:** Category II

## Natural Ventilation Overheating Results

Zone Name	Room Use	Occupied Summer Hours	Max. Exceedable Hours	Criterion 1: #Hours Exceeding Comfort Range	Annual Night Occupied Hours for Bedroom	Max Exceedable Night Hours	Criterion 2: Number of Night Hours Exceeding 26 °C for Bedrooms.	Result
5th - Ante Room	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Bathroom 01	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Bathroom 03	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Bathroom 04	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Bedroom 01	Bedroom	3672	110	221	3285	32	372	Fail
5th - Bedroom 02	Bedroom	3672	110	196	3285	32	422	Fail
5th - Bedroom 03	Bedroom	3672	110	192	3285	32	388	Fail
5th - Bedroom 04	Bedroom	3672	110	187	3285	32	334	Fail
5th - Boot Room	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Dressing Room	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Entrance Hall	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Inner Hall	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Laundry Utility	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Plant	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Shower Room 02	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Study Bedroom 05	Other	1989	59	109	N/A	N/A	N/A	Fail
6th - Circulation	Other	0	0	0	N/A	N/A	N/A	Pass
6th - Living/Kitchen	Other	1989	59	122	N/A	N/A	N/A	Fail
6th - Plant	Other	0	0	0	N/A	N/A	N/A	Pass
6th - Reading Room	Other	1989	59	227	N/A	N/A	N/A	Fail
6th - Staircase 02	Other	0	0	0	N/A	N/A	N/A	Pass
6th - WC	Other	0	0	0	N/A	N/A	N/A	Pass
7th - Staircore 02	Other	0	0	0	N/A	N/A	N/A	Pass

\*Zone name's that have an orange coloured font are bedrooms which do not have 24/7 365 days a year occupancy, as per the TM59 guidance.



# Domestic Overheating (CIBSE TM59)

## Project Details

**Building Designer File (.tbd):** J3988 - Shelton Street\_London\_LWC\_DSY3\_2020High50.tbd

**Simulation Results File (.tsd):** J3988 - Shelton Street\_London\_LWC\_DSY3\_2020High50.tsd

**Date:** 27 April 2022

**Building Category:** Category II

## Natural Ventilation Overheating Results

Zone Name	Room Use	Occupied Summer Hours	Max. Exceedable Hours	Criterion 1: #Hours Exceeding Comfort Range	Annual Night Occupied Hours for Bedroom	Max Exceedable Night Hours	Criterion 2: Number of Night Hours Exceeding 26 °C for Bedrooms.	Result
5th - Ante Room	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Bathroom 01	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Bathroom 03	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Bathroom 04	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Bedroom 01	Bedroom	3672	110	305	3285	32	426	Fail
5th - Bedroom 02	Bedroom	3672	110	302	3285	32	421	Fail
5th - Bedroom 03	Bedroom	3672	110	298	3285	32	399	Fail
5th - Bedroom 04	Bedroom	3672	110	268	3285	32	336	Fail
5th - Boot Room	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Dressing Room	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Entrance Hall	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Inner Hall	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Laundry Utility	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Plant	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Shower Room 02	Other	0	0	0	N/A	N/A	N/A	Pass
5th - Study Bedroom 05	Other	1989	59	152	N/A	N/A	N/A	Fail
6th - Circulation	Other	0	0	0	N/A	N/A	N/A	Pass
6th - Living/Kitchen	Other	1989	59	156	N/A	N/A	N/A	Fail
6th - Plant	Other	0	0	0	N/A	N/A	N/A	Pass
6th - Reading Room	Other	1989	59	248	N/A	N/A	N/A	Fail
6th - Staircase 02	Other	0	0	0	N/A	N/A	N/A	Pass
6th - WC	Other	0	0	0	N/A	N/A	N/A	Pass
7th - Staircore 02	Other	0	0	0	N/A	N/A	N/A	Pass

\*Zone name's that have an orange coloured font are bedrooms which do not have 24/7 365 days a year occupancy, as per the TM59 guidance.