

West Road Tottenham

Thermal Comfort Study

Issue 1

19 June 2026



Shepherd Brombley Partnership

Unit 28

Basepoint Business Centre

1 Winnall Valley Road

Winchester

Hampshire

SO23 0LD

Tel: 01962 832656

email@shepherdbrombley.co.uk

www.shepherdbrombley.co.uk

Prepared By			
Name	Qualifications	Signature	Date
Aaron Batten	CIBSE LCEA 206039		19/06/26

REVISIONS

Issue	Description	Date
1	First Issue	19/06/26

EXECUTIVE SUMMARY

Overview

This Thermal Comfort Study has been prepared in connection with the construction of a single speculative building providing up to 6,273m² for flexible B2 general industrial, B8 storage and distribution, and E(g)(iii) light industrial uses with ancillary office, associated service yard, access point, car parking, and landscape planting at West Road, Tottenham.

This study reviews the overheating risk assessment of selected zones within the building at West Road, carried out in line with CIBSE *Guide A* (2015) and TM52 *The Limits of Thermal Comfort: Avoiding Overheating in European Buildings* (2013).

A dynamic thermal model has been built to compute predicted internal temperatures for assessment.

The simulations within the results show how staged passive & active improvements can be made to enhance internal comfort.

The thermal simulations show that by including a combination of passive & active measures paired with comfort cooling systems compliance with the CIBSE assessment criteria can be met.

No design changes have been made as the project has progressed through the detailed design stage. Accordingly, the Overheating Risk Analysis results presented in the Shepherd Brombley Partnership Ltd Energy Statement (dated 25/06/2025) remain valid and continue to represent the performance of the proposed development.

CONTENTS

1.0 INTRODUCTION

- 1.1 CIBSE Guide A (2015) and TM52 Adaptive Thermal Comfort (2013)**
- 1.2 Overheating Assessment Compliance**

2.0 BRIEF SCOPE OF REFURBISHMENT PROPOSALS

- 2.1 Site Layout**
- 2.2 Calculation Methodology**

3.0 DESIGN CRITERIA

- 3.1 Geometry**
- 3.2 Weather File**
- 3.3 Building Design Criteria**
- 3.4 Operational Profiles**
- 3.5 Fabric & Constructions**
- 3.6 Openings**

4.0 Results

- 4.1 Cooling Demand**
- 4.2 Future Cooling Demand**

5.0 Conclusion

1.0 INTRODUCTION

This Thermal Comfort Study has been prepared in connection with the construction of a single speculative building providing up to 6,273m² for flexible B2 general industrial, B8 storage and distribution, and E(g)(iii) light industrial uses with ancillary office, associated service yard, access point, car parking, and landscape planting at West Road, Tottenham.

This study reviews the overheating risk assessment of selected zones within the building at West Road, carried out in line with CIBSE *Guide A* (2015) and TM52 *The Limits of Thermal Comfort: Avoiding Overheating in European Buildings* (2013).

A dynamic thermal model has been built to compute predicted internal temperatures for assessment.

1.1 CIBSE Guide A (2015) and TM52 Adaptive Thermal Comfort (2013)

CIBSE Guide A (2015) recommends the use of the adaptive thermal comfort methodology, as defined in CIBSE TM52 *The Limits of Thermal Comfort*, to assess the risk of overheating in free-running, naturally ventilated buildings. This approach replaces the single-temperature criterion set out in the 2006 edition of CIBSE Guide A, which advised limiting operative temperatures above 28°C to no more than 1% of the annual occupied hours and established a maximum acceptable indoor operative temperature of 30°C.

Several factors support the shift to the adaptive thermal comfort methodology. Under the adaptive approach, the temperature at which most occupants feel comfortable varies in line with the prevailing indoor conditions, which themselves correlate with outdoor temperatures. As a result, comfort temperatures in free-running buildings adjust dynamically with changes in the external environment.

1.2 Overheating Assessment Compliance

Overheating Analysis, as defined by CIBSE TM52 has been used to assess if the building can maintain an optimal temperature and that it doesn't exceed excessively high temperatures throughout the summer months.

There are 3 criteria to assess overheating potential within the CIBSE TM52 Adaptive Thermal Comfort analysis. A building that fails two or more of the criteria is deemed to be at an unacceptable risk of overheating.

The 3 CIBSE TM52 Overheating Assessment Criteria are:

1. The first criterion sets a limit for the number of hours that the operative temperature can exceed the threshold comfort temperature (upper limit of the range of comfort temperature) by 1°K or more during the occupied hours of a typical non-heating season (1st May to 30th September). The number of hours during which ΔT 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. ΔT is defined as operative temperature less the maximum acceptable temperature.
2. The second criterion deals with the severity of overheating within any one day, which can be as important as its frequency, the level of which is a function of both temperature rise and its duration. This criterion sets a daily limit for acceptability. To allow for the severity of overheating, the weighted exceedance shall be less than or equal to 6 in any one day.
3. The third criterion sets an absolute maximum daily temperature for a room, beyond which the level of overheating is unacceptable. To set an absolute maximum value for the indoor operative temperature the value of ΔT shall not exceed 4 °K.

2.2 Calculation Methodology

2.2.1 General

All thermal calculations undertaken for this assessment have been completed using the IES Apache simulation suite, which provides a robust platform for dynamic thermal modelling and environmental performance analysis. The model has been configured to reflect the proposed building geometry, construction build-ups, occupancy patterns, internal gains, and ventilation strategies relevant to the building.

Dynamic overheating assessments have been carried out in accordance with the methodologies set out in CIBSE TM52 *The Limits of Thermal Comfort*, using the appropriate future weather files and high-temperature data sets defined in CIBSE TM49. These datasets enable the evaluation of building performance under both typical and extreme summer conditions, ensuring that the analysis reflects realistic climate resilience expectations.

The modelling approach follows industry-standard procedures for free-running buildings, applying the adaptive thermal comfort criteria to determine the likelihood and severity of overheating events. This ensures that the results are aligned with current best practice and provide a reliable basis for design decision-making.

2.2.2 The London Plan Cooling Hierarchy

London Plan Policy SI 4 requires the application of a cooling hierarchy as defined below:

The Cooling Hierarchy – Passive Stages	
1. Reduce the amount of heat entering the building through orientation, shading high albedo materials, fenestration, insulation and provision of green infrastructure.	The occupied office areas within the building have been positioned on the north facing façades to limit the effects of solar gain. <i>(note. Solar shading not proposed due to limited benefit on selected occupied orientation.)</i>
	Solar Control Glazing is proposed to the office areas to limit the effects of solar gain.
2. Minimise internal heat generation through energy efficient design.	The domestic hot water pipework runs are limited in occupied spaces, insulated and predominantly run in service voids.
3. Manage the heat within the building through exposed internal thermal mass and high ceilings.	A dense concrete slab between floors will add thermal mass within the building.
4. Provide passive ventilation.	Openable windows with trickle ventilators shall be provided to office areas. Details can be found on the PRC elevation drawings.

Table 1. Passive Stages

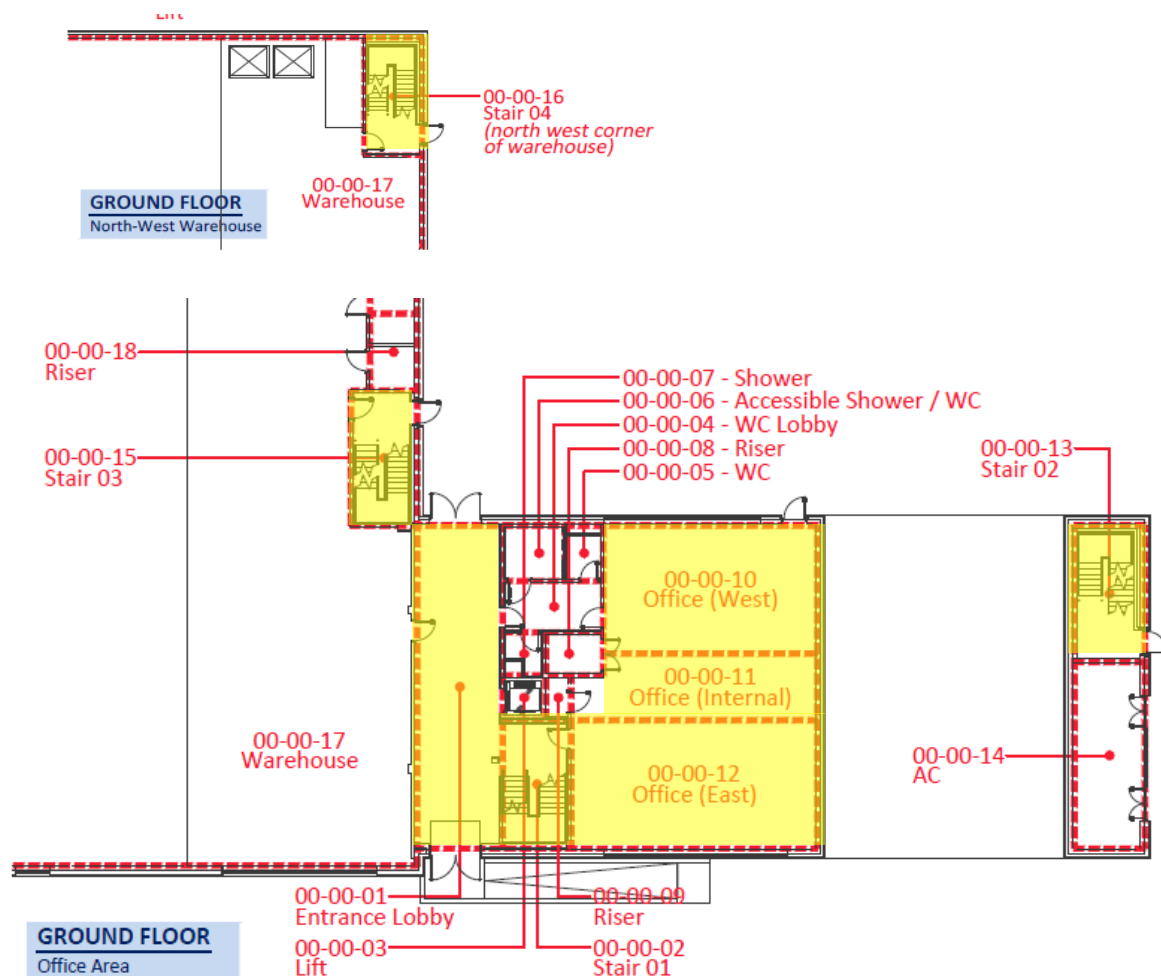
The Cooling Hierarchy – Active Stages	
5. Provide mechanical ventilation.	Mechanical ventilation heat recovery units shall provide ventilation to the office areas. The units are capable of functioning in summer bypass mode of the heat exchanger to provide pre-cooling of the space. Mechanical ventilation rates are modelled at 1.4l/s/m ² in accordance with BCO guidance.
6. Provide active cooling systems.	Cooling will be provided to the office and entrance area via a dual mode VRF system capable of effectively moving heat from areas that require cooling to those that require heating.

Table 2. Active Stages

3.0 DESIGN CRITERIA

3.1 Geometry

3.1.1 Assessment Zones



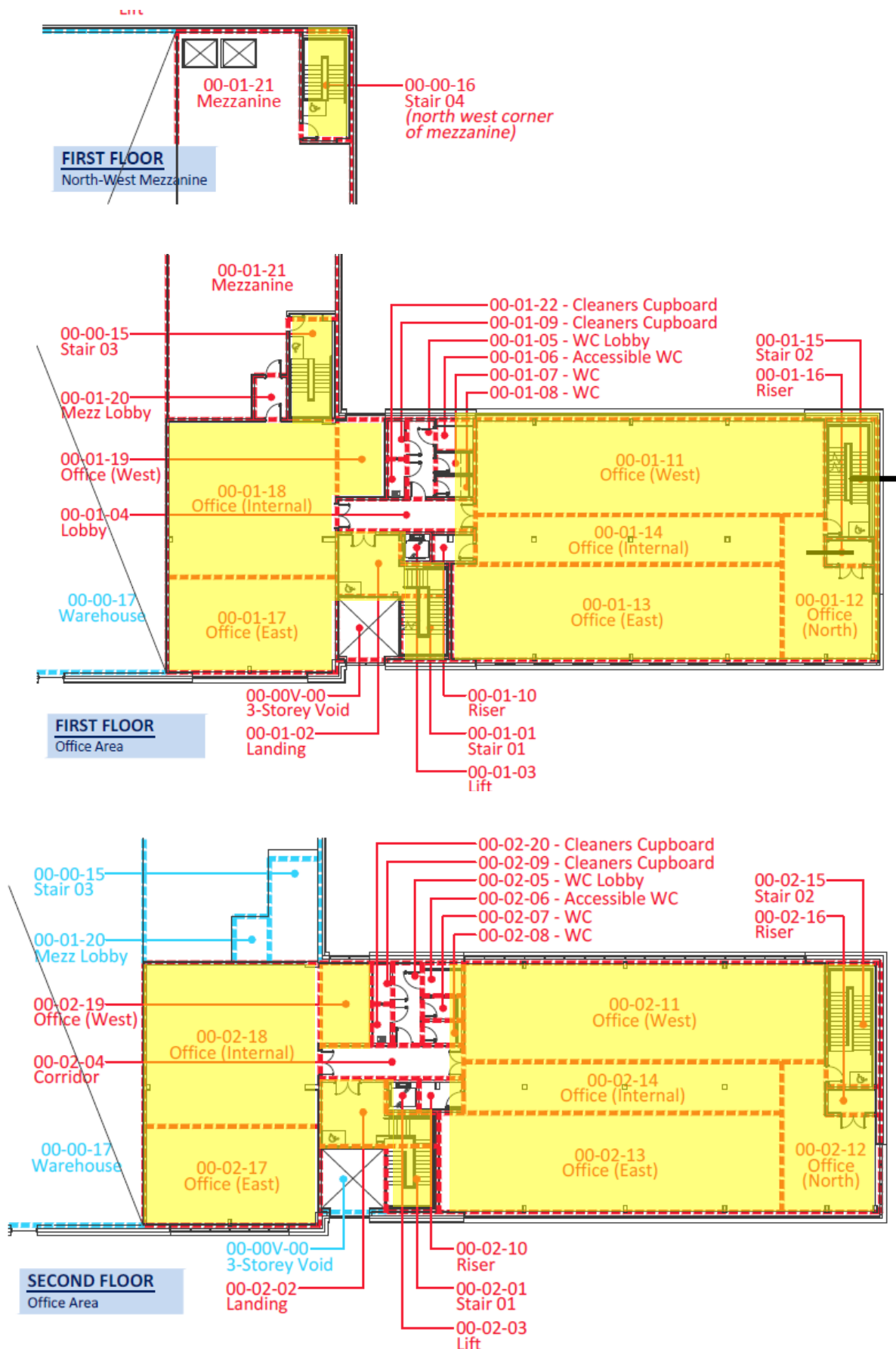


Figure 3. Layout of Occupied Zones

3.1.2 Zone Geometry

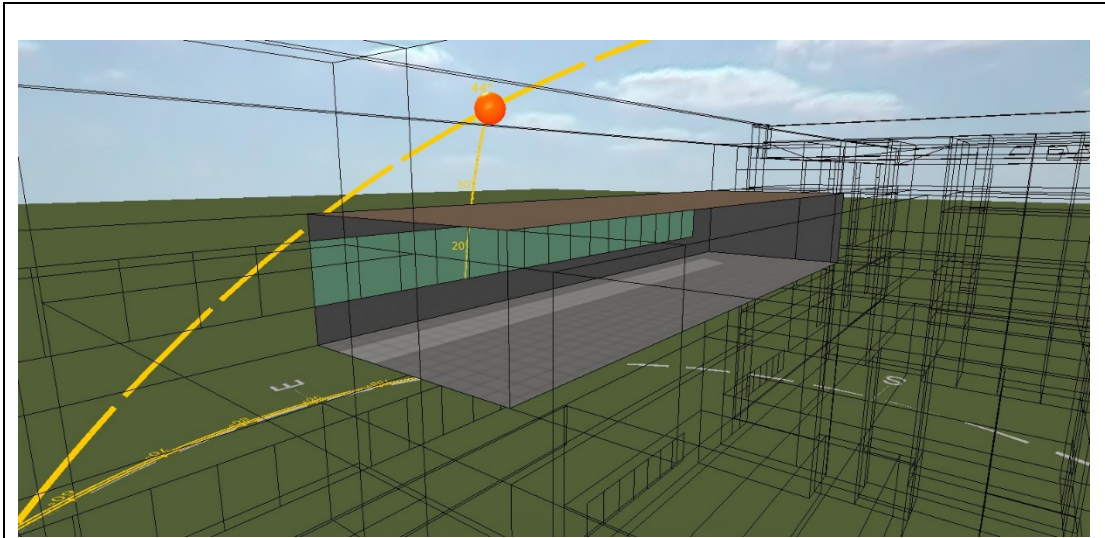


Figure 4. Extract of an Occupied Zone, 2nd Floor Office

3.1.3 Model Images



Figure 5. Site Ariel View

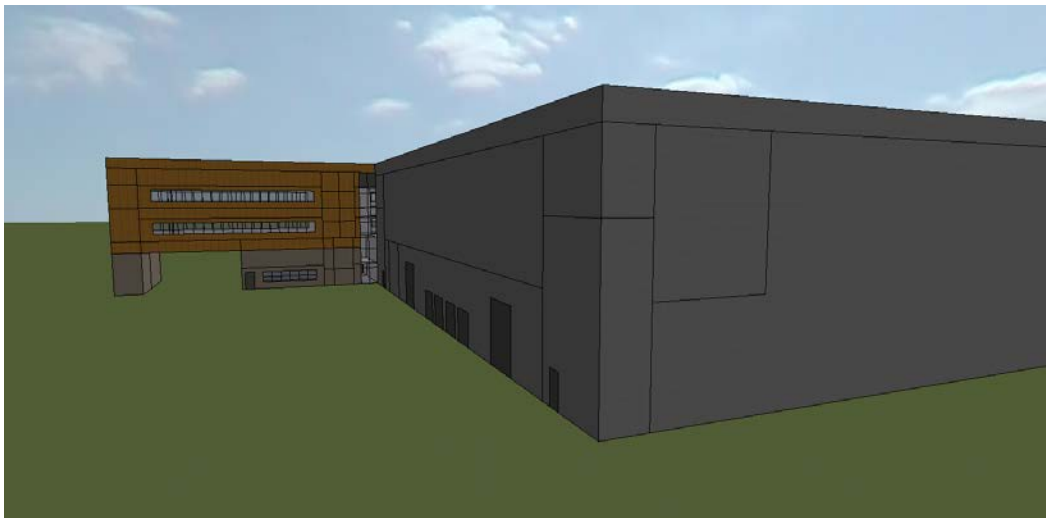


Figure 6. West Elevations



Figure 7. East Elevations

3.2 Weather File

The overheating analysis has been undertaken using the nearest CIBSE DSY1 (Design Summer Year) weather file for the 2020s, high-emissions, 50th-percentile scenario. This selection aligns with current industry guidance, ensuring that the assessment reflects a representative yet climate-resilient basis for evaluating overheating risk.

External Design Criteria	
Weather File	London_LWC_DSY1_2020High50.epw

Table 3. External Design Criteria

3.3 Building Design Criteria

This section sets out the key design assumptions used in the thermal modelling, including occupancy, internal gains, ventilation strategy and construction performance. These criteria provide the baseline conditions for assessing overheating risk and ensure the analysis reflects expected building operation.

Building Design Criteria	
Building Form & Orientation	Taken from PRC Architects Drawings
Operating Hours	07:00 and 17:00
Infiltration	
Office Areas	0.25 Ach/hr Summer
Internal Heat Gains	
Lighting	8W/m ²
Small Power	10W/m ² (75% Diversity)
Occupants	90W/person Sensible 60W/person Latent
Relative Humidity	50%RH
Occupancy Density	1 Person/10m
Thermal Comfort Criteria	
Clothing Level	1.0 – 2.0
Activity Level	1.0
Air Speed	0.15m/s

Table 4. Building Design Criteria

3.4 Operational Profiles

Operational profiles define how the building is expected to be used and are applied within the thermal model to represent typical patterns of occupancy, equipment use, lighting demand and ventilation behaviour. These profiles ensure that the overheating assessment reflects realistic day-to-day operation and provides an accurate indication of how internal conditions may vary throughout the year.

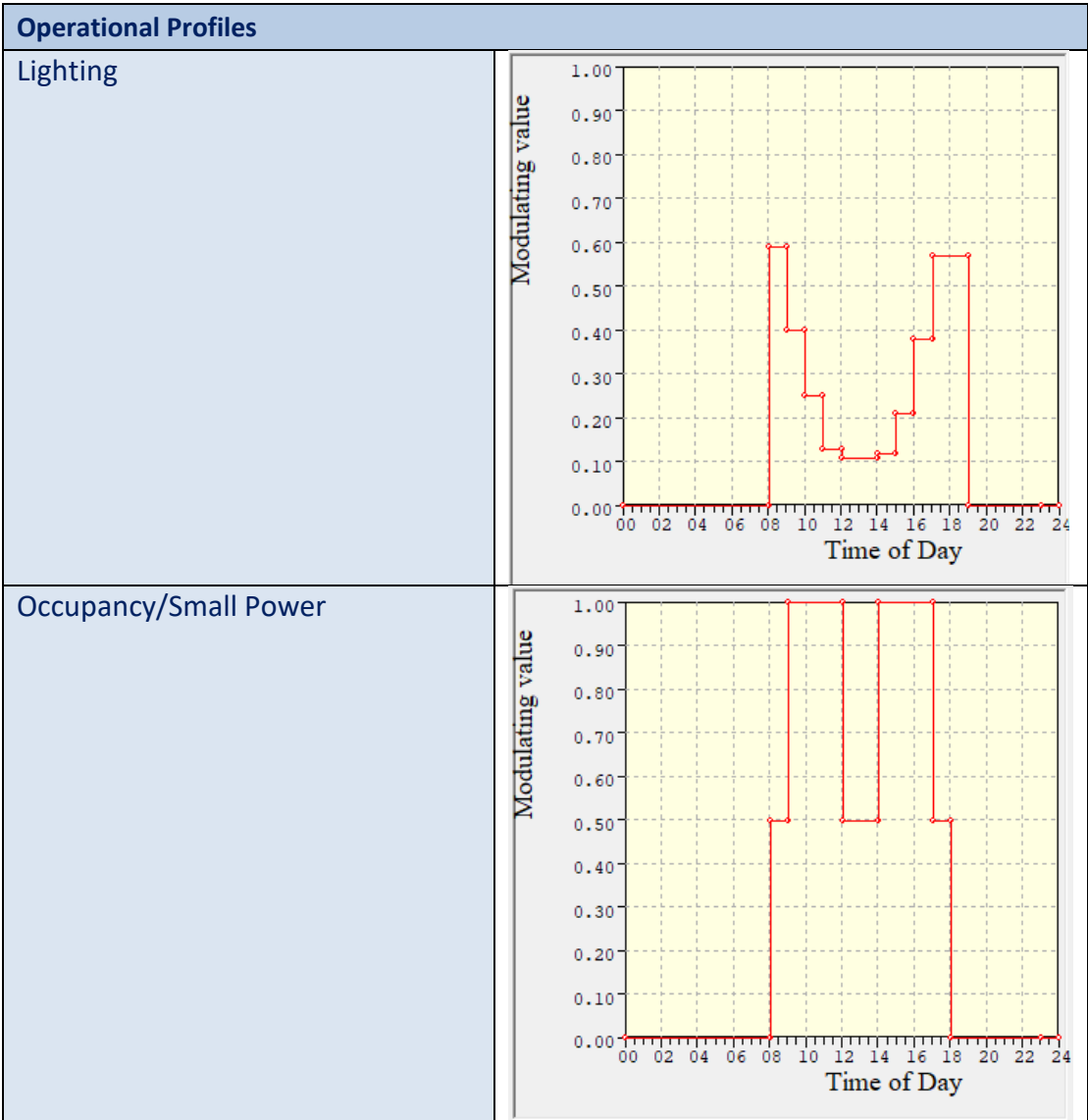


Table 5. Operational Profiles

3.5 Fabric and Construction

The building fabric has been modelled to reflect the thermal performance of the proposed construction, including U-values, thermal mass and air-tightness characteristics. These parameters influence heat transfer through the envelope and play a key role in determining how the building responds to external temperature conditions. Accurately representing the building fabric ensures that the overheating assessment captures the true thermal behaviour of the constructed spaces.

U values	
External Walls	0.26 W/m ² .K
Roof	0.16 W/m ² .K
Exposed Floor	0.18 W/m ² .K
Exposed Sofit	0.18 W/m ² .K
Glazing/Curtain Walling	1.60 W/m ² .K
Spandrel Panels	0.26 W/m ² .K
Rooflights	1.30 W/m ² .K
Personnel Doors	1.60 W/m ² .K
Loading Bay Doors	1.60 W/m ² .K

Table 6. U Values

Glazing Properties	
G Value	0.36
Light Transmittance	0.66

Table 7. Glazing Properties

3.6 Openings

Openings within the model—such as windows have been represented in accordance with the proposed design and expected operational strategy. Their size, location and opening behaviour directly influence natural ventilation rates and therefore play a critical role in moderating internal temperatures in free-running conditions. Accurately modelling these openings ensures that the assessment captures realistic airflow potential and reflects how the building is likely to perform during warmer periods.

Natural Ventilation – Trickle Vent	1 ach/h – On continuously
Natural Ventilation – Windows Open	Additional 1 ach/h – 07:00-17:00

Table 8. Openings

4.0 RESULTS

The results of the CIBSE TM52 Overheating Assessment can be measured against a base model to demonstrate the application of the Cooling Hierarchy. The **BASE** results of the CIBSE TM52 Overheating Assessment are as follows:

Room Name	Occupied days (%)	Criteria 1 (%Hrs Top-Tmax>=1K)	Criteria 2 (Max. Daily Deg.Hrs)	Criteria 3 (Max. DeltaT)	Criteria failing
00-00-01 - Entrance Lobby	100	51.8	71	9	1 & 2 & 3
00-00-02 - Stair 01	100	52	68	9	1 & 2 & 3
00-00-04 - WC Lobby	100	42.5	55	6	1 & 2 & 3
00-00-10 - Office (West)	85.6	40.8	63	9	1 & 2 & 3
00-00-11 - Office (Internal)	85.6	46.3	68	10	1 & 2 & 3
00-00-12 - Office (East)	85.6	56.6	81	11	1 & 2 & 3
00-00-13 - Stair 02	100	4.1	23	3	1 & 2
00-00-15 - Stair 03	100	1.9	20	2	2 – Overall Pass
00-00-16 - Stair 04	100	1.8	15	2	2 – Overall Pass
00-01-01 - Stair 01	100	56.1	75	9	1 & 2 & 3
00-01-02 - Landing	100	53.9	71	8	1 & 2 & 3
00-01-04 - Corridor	100	37.9	57	6	1 & 2 & 3
00-01-05 - WC Lobby	100	35	53	6	1 & 2 & 3
00-01-11 - Office (West)	85.6	51.2	72	10	1 & 2 & 3
00-01-12 - Office (North)	85.6	68.5	95	12	1 & 2 & 3
00-01-13 - Office (East)	85.6	64.2	86	11	1 & 2 & 3
00-01-14 - Office (Internal)	85.6	56.3	74	10	1 & 2 & 3
00-01-15 - Stair 02	100	14.7	40	5	1 & 2 & 3
00-01-17 - Office (East)	85.6	22.7	52	8	1 & 2 & 3
00-01-18 - Office (Internal)	85.6	20.2	50	8	1 & 2 & 3

Room Name	Occupied days (%)	Criteria 1 (%Hrs Top-Tmax>=1K)	Criteria 2 (Max. Daily Deg.Hrs)	Criteria 3 (Max. DeltaT)	Criteria failing
00-01-19 - Office (West)	85.6	32	59	8	1 & 2 & 3
00-01-20 - Mezz Lobby	100	4.2	30	3	1 & 2
00-02-01 - Stair 01	100	57.3	76	9	1 & 2 & 3
00-02-02 - Landing	100	50.8	68	8	1 & 2 & 3
00-02-04 - Corridor	100	35.2	56	6	1 & 2 & 3
00-02-05 - WC Lobby	100	29.9	49	5	1 & 2 & 3
00-02-11 - Office (West)	85.6	47.3	72	10	1 & 2 & 3
00-02-12 - Office (North)	85.6	62	86	11	1 & 2 & 3
00-02-13 - Office (East)	85.6	58.2	84	11	1 & 2 & 3
00-02-14 - Office (Internal)	85.6	50.7	75	10	1 & 2 & 3
00-02-15 - Stair 02	100	19.2	45	5	1 & 2 & 3
00-02-17 - Office (East)	85.6	27.6	58	8	1 & 2 & 3
00-02-18 - Office (Internal)	85.6	22.9	52	8	1 & 2 & 3
00-02-19 - Office (West)	85.6	27.4	54	8	1 & 2 & 3

Notes:

1. Building Category II – New Builds
2. Weather File: London_LWC_DSY1_2020High50.epw

Table 9. CIBSE TM52 Overheating Assessment Table BASE: Non-residential

Following review of the base results, the **Passive Stages 1-4** of the cooling hierarchy can be applied, the results of the CIBSE TM52 Overheating Assessment are as follows:

Room Name	Occupied days (%)	Criteria 1 (%Hrs Top-Tmax>=1K)	Criteria 2 (Max. Daily Deg.Hrs)	Criteria 3 (Max. DeltaT)	Criteria failing
00-00-01 - Entrance Lobby	100	2.1	13	3	2 – Overall Pass
00-00-02 - Stair 01	100	1.1	8	2	2 – Overall Pass
00-00-04 - WC Lobby	100	0.3	3	1	- Overall Pass
00-00-10 - Office (West)	85.6	6.3	20	5	1 & 2 & 3
00-00-11 - Office (Internal)	85.6	4.5	19	4	1 & 2
00-00-12 - Office (East)	85.6	5.1	22	4	1 & 2
00-00-13 - Stair 02	100	0.2	2	1	- Overall Pass
00-00-15 - Stair 03	100	0	0	0	- Overall Pass
00-00-16 - Stair 04	100	0	0	0	- Overall Pass
00-01-01 - Stair 01	100	1.4	11	3	2 – Overall Pass
00-01-02 - Landing	100	1.4	8	2	2 – Overall Pass
00-01-04 - Corridor	100	0.3	3	1	- Overall Pass
00-01-05 - WC Lobby	100	0.2	2	1	- Overall Pass
00-01-11 - Office (West)	85.6	6.9	20	5	1 & 2 & 3
00-01-12 - Office (North)	85.6	7.2	25	5	1 & 2 & 3
00-01-13 - Office (East)	85.6	4.6	21	4	1 & 2
00-01-14 - Office (Internal)	85.6	4.1	16	4	1 & 2
00-01-15 - Stair 02	100	0.2	2	1	- Overall Pass
00-01-17 - Office (East)	85.6	3.3	18	4	1 & 2
00-01-18 - Office (Internal)	85.6	5.5	23	5	1 & 2 & 3
00-01-19 - Office (West)	85.6	5.4	21	5	1 & 2 & 3
00-01-20 - Mezz Lobby	100	0.5	5	1	- Overall Pass

Room Name	Occupied days (%)	Criteria 1 (%Hrs Top-Tmax>=1K)	Criteria 2 (Max. Daily Deg.Hrs)	Criteria 3 (Max. DeltaT)	Criteria failing
00-02-01 - Stair 01	100	1.5	11	3	2 – Overall Pass
00-02-02 - Landing	100	0.7	3	1	- Overall Pass
00-02-04 - Corridor	100	0.2	2	1	- Overall Pass
00-02-05 - WC Lobby	100	0.1	1	1	- Overall Pass
00-02-11 - Office (West)	85.6	5.3	16	4	1 & 2
00-02-12 - Office (North)	85.6	3.7	17	3	1 & 2
00-02-13 - Office (East)	85.6	3.3	16	3	1 & 2
00-02-14 - Office (Internal)	85.6	2.6	13	3	2 – Overall Pass
00-02-15 - Stair 02	100	0.2	2	1	- Overall Pass
00-02-17 - Office (East)	85.6	2.7	15	3	2 – Overall Pass
00-02-18 - Office (Internal)	85.6	3.6	18	4	1 & 2
00-02-19 - Office (West)	85.6	5.3	20	6	1 & 2 & 3

Notes:

1. Building Category II – New Builds
2. Weather File: London_LWC_DSY1_2020High50.epw

Table 10. CIBSE TM52 Overheating Assessment Table Stages 1-4: Non-residential

4.1 **Cooling Demand**

The results of the CIBSE TM52 Overheating Assessment show that the occupied areas designated for office use within the building will require active cooling and mechanical ventilation.

By applying the passive energy efficiency measures in stages, it can be demonstrated how the building active cooling demand can be reduced **before** cooling plant is selected.

Passive Measure	Non-residential Cooling Demand (MWh)
Base	26.1
Stage 1 – Heat Reduction	21.3
Stage 2 – Minimise Internal Gains	19.5
Stage 3 – Thermal Mass	19.1
Stage 4 – Passive Ventilation	14.2

Table 11. Cooling Demand Reduction

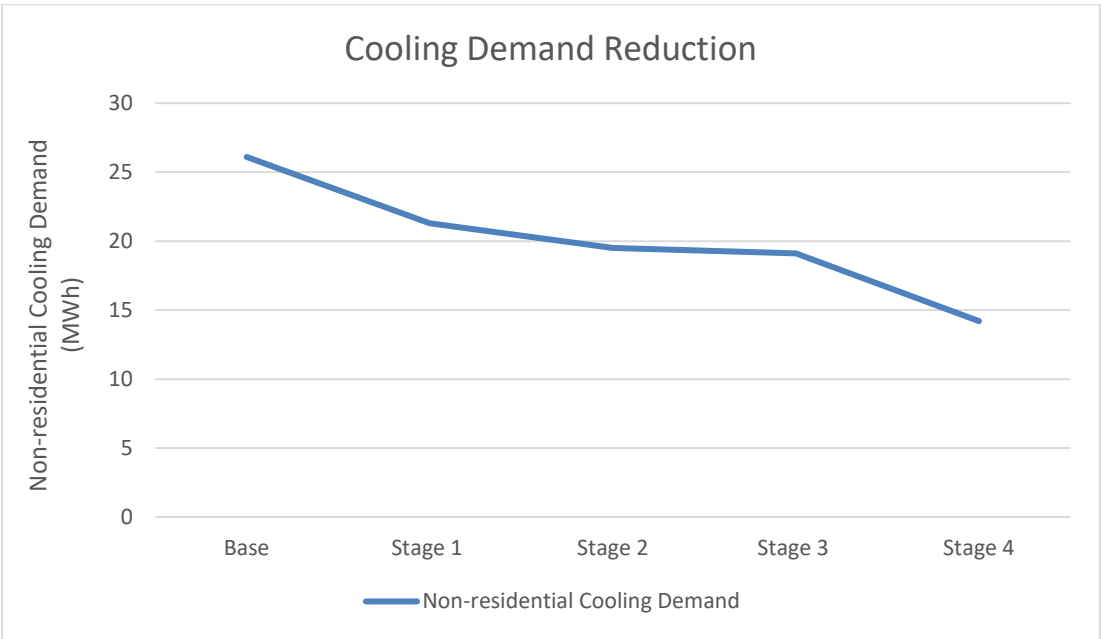


Figure 8. Cooling Demand Reduction

The GLA guidance suggests that where active cooling is specified within a zone the aim should be to reduce the actual cooling demand below that of the notional building.

	Area weighted average non-residential cooling demand (MJ/m ²)	Total area weighted non-residential cooling demand (MJ/year)
Actual	1.13	n/a
Notional	1.6	n/a

Table 12. GLA Cooling Demand Table

The actual building cooling demand is less than the notional target in line with GLA guidance.

4.2 Future Cooling Demand

Where active cooling has been proposed to the office areas it is necessary to consider the system cooling demand in a future climate change scenario, by modelling with the future weather data set:

- London_LWC_DSY2_2050High50.epw

Future Climate Change Check	Non-residential Cooling Demand (MWh)
Stage 4 – Active Cooling	25.5

Table 13. Future Cooling Demand

The risk of future climate change shall fall with the building tenants to mitigate. A potential mitigation measure would be to introduce internal blinds. The simulated results below demonstrate a reduction in the future cooling demand should blinds be installed.

Future Climate Change Mitigation	Non-residential Cooling Demand (MWh)
Internal Blinds – tenant install	19.5

Table 14. Future Cooling Demand Mitigation

5.0 CONCLUSION

No design changes have been made as the project has progressed through the detailed design stage. Accordingly, the Overheating Risk Analysis results presented in the Shepherd Brombley Partnership Ltd Energy Statement (dated 25/06/2025) remain valid and continue to represent the performance of the proposed development.

A comprehensive package of passive and active design measures has been incorporated to minimise internal heat gains and reduce the building's cooling demand as far as practicable. These measures include enhancements to the building fabric, optimisation of glazing performance, improved natural ventilation strategies, and the integration of efficient mechanical systems.

Despite these interventions, the assessment demonstrates that the building cannot fully comply with the CIBSE TM52 overheating criteria under the required design weather files. The residual risk is driven by factors that cannot be mitigated further through passive means without compromising the functional or architectural requirements of the scheme.

To ensure a safe, comfortable, and compliant internal environment for occupants, a targeted comfort-cooling solution has therefore been provided to the primary occupied zones. This approach delivers robust thermal comfort performance while maintaining the project's commitment to energy efficiency and minimising operational carbon.