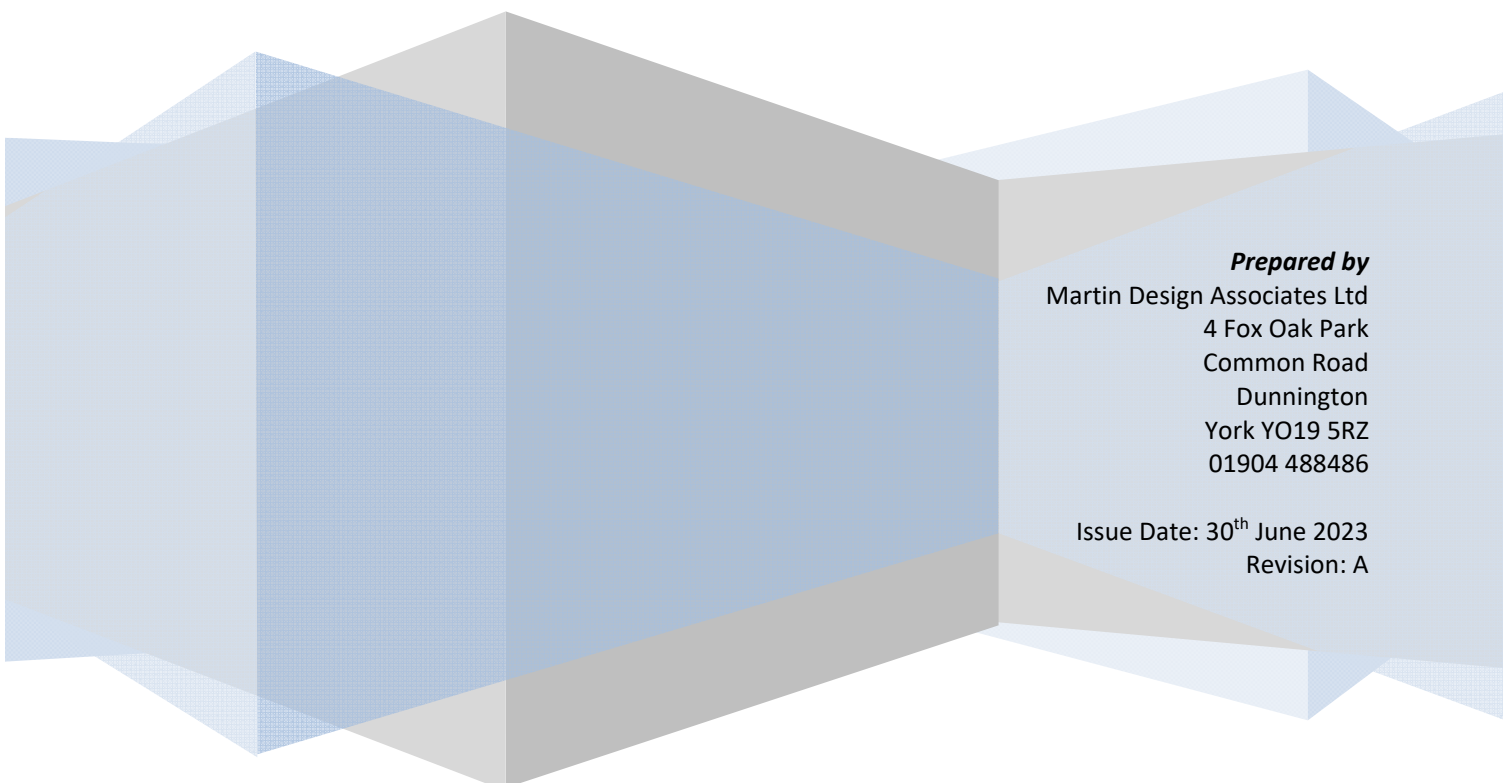


**Proposed Development  
Ashley Road West - Marketing Suite  
London**

**As Built TM52 Adaptive Overheating Report  
Assumptions and Results**

**LJJ Contracting Ltd**



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| Rev | Date       | Compiled / Reviewed by | Revision / Document Description                      |
|-----|------------|------------------------|------------------------------------------------------|
| -   | 29.09.2022 | RG / AW                | First Issue As Designed Report                       |
| A   | 30.06.2023 | RG / AW                | Building assessed against more extreme weather files |
|     |            |                        |                                                      |

## 1.0 EXECUTIVE SUMMARY

This analysis has been carried out using EDSL TAS 9.5.5 which is CIBSE AM11 accredited dynamic thermal modelling software with the appropriate weather data corresponding to the development location.

Building geometry, M&E systems and heat gains reflect the As Built information provided by LJJ Contracting and Pollard Thomas Edwards.

All rooms in the proposed Marketing Suite are compliant with Building Regulations Part L2A overheating criteria when assessed against CIBSE Guide A (2013) – *Environmental Design, Table 1.5* and CIBSE TM52 – *The limits of thermal comfort: avoiding overheating in European buildings*.

Moreover, all rooms in the proposed Marketing suite were able to demonstrate TM52 compliance against more extreme and future weather files (DSY2, DSY3, 2050 and 2080). Weather files are detailed in Section 4.1.

Using the input data and constructions within this report all occupied spaces pass the overheating tests itemised within CIBSE TM52. It should be noted that while all rooms pass, overheating may still occur.

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## 2.0 PURPOSE OF ANALYSIS

The overheating analysis will determine whether the building design and service strategy will provide satisfactory internal temperatures in rooms which are to be occupied for 30 minutes or more. All of the rooms under assessment are mechanically ventilated office/sales spaces and some of them Air conditioned.

Each occupied space has been assigned an internal condition with heat gains taken from industry standard publications in conjunction with reviewing the architectural, mechanical and electrical design drawings. A full schedule of internal heat gains can be found within the input data section 4.0 of this report.

This analysis has been carried out using EDSL TAS 9.5.5 which is CIBSE AM11 accredited dynamic thermal modelling software. The input data detailed in section 4.0 of this report has been utilised to build the thermal model. Where specific data could not be sourced, assumptions have been made which are noted throughout this report.

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### 3.0 PARAMETERS OF REQUIREMENTS

#### 3.1 CIBSE AM11 – Building energy and environmental modelling (BEEM)

Building energy and environmental modelling (BEEM) software allows comparison of different design and refurbishment options in order to optimise building performance and to improve the quality of buildings. It encourages the adoption of innovative design features, and assists communication within the design team.

Building services engineering practices are the principal target readership, but the manual should also be of interest to architects, developers, facility managers and users of buildings.

CIBSE AM11 sets out the building energy and environmental modelling (BEEM) criteria as follows:

- Role of modelling in the design process
- Categories of BEEM software and their uses
- Establishing a simulation capability
- How to use BEEM software

#### 3.2 CIBSE Guide A (2015) – Environmental Design, Table 1.5

Table 1.5 in CIBSE Guide A gives general guidance and recommendations, based on professional experience and judgement, on suitable winter and summer temperatures (together with outdoor air supply rates, filtration grades, maintained illuminances and suggested maximum noise ratings) for a range of room and building types. Operative temperature set-points within the ranges suggested are likely to be found satisfactory, provided the guidance given in section 1.4.1 on within-day and day-on-day variation is observed.

#### 3.3 CIBSE TM52 – The limits of thermal comfort

CIBSE TM52 was produced as it was becoming recognised that existing advice on overheating, as contained in chapter 1 of the 2006 edition of CIBSE Guide A (CIBSE, 2006), is increasingly restrictive and therefore a more comprehensive guide was needed for inclusion in the next edition of Guide A (CIBSE, 2013) and other CIBSE documents.

CIBSE TM52 sets the following criteria for defining overheating in free-running buildings:

The following three criteria, taken together, provide a robust yet balanced assessment of the risk of overheating of buildings in the UK and Europe. A room or building that fails any two of the three criteria is classed as overheating.

- a) 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 (1 May to 30 September).
- b) 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.

- c) The third criterion sets an absolute maximum daily temperature for a room, beyond which the level of overheating is unacceptable.

These are recommendations only and have no statute in law, but these limits are generally accepted by designers and organisations such as BRE and CIBSE as demonstrating compliance for overheating within naturally ventilated buildings.

There are no specific overheating standards for transient circulation spaces, WC's, store rooms and therefore these spaces are not considered in the report.

## 4.0 INPUT DATA

### 4.1 Weather Data

In accordance with CIBSE TM52 paragraph 6.1.1 item (1) – *Prediction by simulation*, the CIBSE Design Summer Year (DSY) weather file for London has been used for the overheating analysis. This is the closest, and most appropriate, weather file for the Marketing suite and consists of hourly data for twelve hot months, selected from the third hottest years in the last 20 years, and smoothed to provide a composite, but continuous, 1-year sequence of data. The DSY weather data file is also used for design cooling calculations.

The closest weather station to the development is London Weather Centre hence London\_LWC\_DSY1\_2020High50 weather files has been used for this assessment. To expand the assessment and further test the design, four additional simulations have been done with more extreme weather files. Although CIBSE TM52 does not require that to be done and compliance only with the DSY1 file is required, demonstrating occupiers thermal comfort in the future scenarios is a good indication for robust design. The weather files used for this report are:

1. London\_LWC\_DSY1\_2020High50
2. London\_LWC\_DSY2\_2020High50
3. London\_LWC\_DSY3\_2020High50
4. London\_LWC\_DSY1\_2050High50
5. London\_LWC\_DSY1\_2080High50

### 4.2 Occupancy Profile

The occupied period for the building has been assumed to be 08:00-20:00. The calendar used for this analysis is as per the NCM Standard 2010 calendar, which is also used for Part L analysis. The calendar dictates the days the building will be “open” and “closed”.

### 4.3 Occupancy Density & Gains

Each occupant has been assigned a sensible heat gain based on the guidance as given in CIBSE Guide A – *Eighth Edition March 2015 Table 6.3* for moderate office work. CIBSE Guide suggests sensible heat gains from an adult 75W and 55W latent heat gain.

#### Sales Area

It has been assumed that the Sales Area will be occupied by a number of people correspond and it has been simulated that the gains will be present from 08:00-20:00.

|        | Occupancy | Sensible Gain<br>(W/Person) | Latent Gain<br>(W/Person) | Total Sensible<br>Gain (W) | Total Latent<br>Gain (W) |
|--------|-----------|-----------------------------|---------------------------|----------------------------|--------------------------|
| Adults | 3         | 75                          | 55                        | 225                        | 165                      |

**Meeting Room**

It has been assumed that the Meeting room will be occupied by a number of people correspond and it has been simulated that the gains will be present from 08:00-20:00.

|        | Occupancy | Sensible Gain<br>(W/Person) | Latent Gain<br>(W/Person) | Total Sensible<br>Gain (W) | Total Latent<br>Gain (W) |
|--------|-----------|-----------------------------|---------------------------|----------------------------|--------------------------|
| Adults | 4         | 75                          | 55                        | 300                        | 220                      |

**Flexible Use**

It has been assumed that the Flexible Use will be occupied by a number of people correspond and it has been simulated that the gains will be present from 08:00-20:00.

|        | Occupancy | Sensible Gain<br>(W/Person) | Latent Gain<br>(W/Person) | Total Sensible<br>Gain (W) | Total Latent<br>Gain (W) |
|--------|-----------|-----------------------------|---------------------------|----------------------------|--------------------------|
| Adults | 6         | 75                          | 55                        | 450                        | 330                      |

**Tea Point**

It has been assumed that the Tea Point will be occupied by a number of people correspond and it has been simulated that the gains will be present from 08:00-20:00.

|        | Occupancy | Sensible Gain<br>(W/Person) | Latent Gain<br>(W/Person) | Total Sensible<br>Gain (W) | Total Latent<br>Gain (W) |
|--------|-----------|-----------------------------|---------------------------|----------------------------|--------------------------|
| Adults | 1         | 75                          | 55                        | 75                         | 55                       |

**4.4 Building Fabric**

The following tabulated constructions have been assumed based on Ashley Road West Tottenham Hale Stage 3b report provided by Environmental Services Design. The thermal performance ('U' value) is calculated within the thermal modelling software based on the construction make-up and materials used.

| Item          | Construction Make Up         | U-Value<br>(W/m <sup>2</sup> K) |
|---------------|------------------------------|---------------------------------|
| External Wall | Non-Residential Areas Values | 0.15                            |
| Ground Floor  | Non-Residential Areas Values | 0.10                            |

| Item             | Construction Make Up                                                         | U-Value (W/m <sup>2</sup> K)           |
|------------------|------------------------------------------------------------------------------|----------------------------------------|
| Roof             | Non-Residential Areas Values                                                 | N/A                                    |
| Window           | Non-Residential Areas Values                                                 | 1.27                                   |
| Thermal Bridging | Non-Residential Areas Values                                                 | 0.10                                   |
| Air Tightness    | Buildings > 500 m <sup>2</sup> built to 2002 Building Regulations (or later) | 5 m <sup>3</sup> /(hr.m <sup>2</sup> ) |

#### 4.5 Infiltration (Air Permeability)

An infiltration rate of 0.20 ac/h has been applied to the transient areas within the building (not part of the analysis but simulated as adjoining spaces). This reflects an anticipated air permeability of 5.0m<sup>3</sup>.h<sup>-1</sup>.m<sup>-2</sup> @ 50Pa for a predominantly Mechanically ventilated single floor Sales areas and Offices.

#### 4.6 Lighting Gains and Control

The lighting density and control has assumed to be the following, based on the requirements of the electrical drawing number 998-ESD-XX-00-DR-X-E-6301 provided by Environmental Services Design:

| Room                                         | Lighting Efficacy (lm/cW) | Lighting Control                                  |
|----------------------------------------------|---------------------------|---------------------------------------------------|
| Sales Area,<br>Flexible Use,<br>Meeting Room | 92.72                     | No Presence Detection,<br>Manual Daylight Control |
| Tea Point                                    | 100                       | No Presence Detection                             |

It has been simulated that the occupants of the Sales Area, Flexible Use and Meeting room will manually turn off the lighting if the target lux level can be achieved via natural means.

#### 4.7 Equipment Gains

All of the inhabited spaces have been assigned sensible equipment heat gains, based on the assumed equipment being present. Gain figures have been taken from CIBSE Guide A – Eighth Edition March 2015 Table 6.6 and 6.15.

| Room         | Appliance |      |         |        |           |        | Total Gain |
|--------------|-----------|------|---------|--------|-----------|--------|------------|
|              | Laptop    | TV   | Printer | Kettle | Microwave | Fridge | W          |
| Sales Area   | 36        |      |         |        |           |        | 36W        |
| Flexible Use | 36        | 2x24 | 15      |        |           |        | 99W        |
| Meeting Room | 36        | 24   |         |        |           |        | 60W        |
| Tea Point    |           |      |         | 22     | 9         | 16     | 47W        |

The equipment gains will follow the occupancy profile and density i.e. in the Sales / Office area the gains will be continuous throughout working day to reflect the occupancy. It is assumed that the Laptops in the Marketing suite will be switched off during the unoccupied period and the gains will therefore diminish to zero (no standby).

#### 4.8 Ventilation

Marketing Suite rooms were modelled in the EDSL TAS software with Mechanical Ventilation as per the As Built Mechanical services drawings provided by LJJ.

Ventilation rates in the assessed spaces are as per the As Built drawing TH-ARM-01-001-M-5079-50-116 AF – Marketing Suite Combined Mechanical Services:

- Tea point – 15 l/s = 2 ACH
- Meeting Room / Sales / Flexible use – 130l/s = 1.6 ACH

#### 4.9 Active cooling

Active cooling was modelled in Flexible use, Meeting room and Sales area as part of the occupied spaces as per the As Built drawing TH-ARM-01-001-M-5079-50-116 AF – Marketing Suite Combined Mechanical Services.

#### 4.10 Window Openings

All windows in the habitable areas are unopenable.

### 5.0 RESULTS AND APPRAISAL

Using the input data and construction mentioned above in Section 4, all occupied spaces pass the overheating tests itemised within CIBSE TM52 for the required weather file - *London\_LWC\_DSY1\_2020High50* and therefore also satisfies the overheating test required to meet Building Regulations Part L2A. The full overheating result is set out in Appendix A.

The results of further testing of the design with the more extreme DSY2 and DSY3 files, and as well as future files (2050s and 2080s), as listed in Section 4.1, demonstrate the building and the design comply with the TM52 overheating criteria.  
The full overheating result is set out in Appendix A.

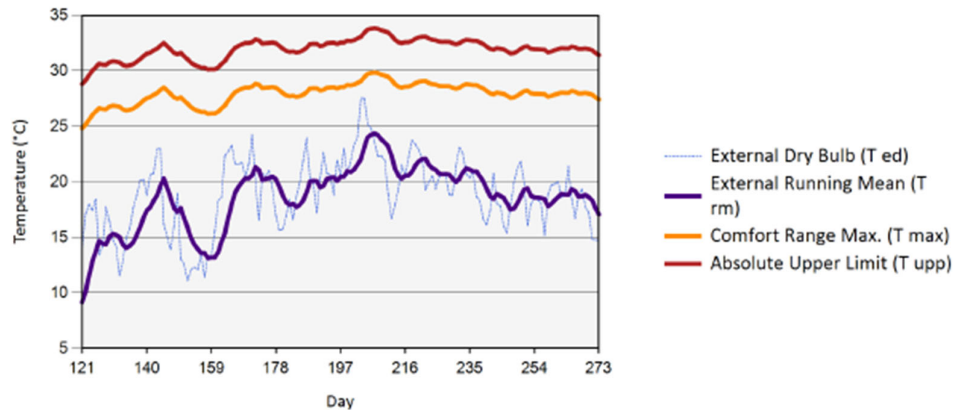
It should be noted that while all rooms pass the overheating tests individual spaces may overheat if the occupancy density/equipment heat gain ratings are significantly higher than those simulated within the thermal model.

## APPENDIX A: RESULTS FROM CIBSE TM52 ANALYSIS

London\_LWC\_DSY1\_2020High50.tsd

## Adaptive Overheating Report (CIBSE TM52)

## Adaptive Summer Temperatures for London\_LWC\_DSY1\_2020High50



The adaptive overheating assessment tests rooms against three criteria. If a room fails any two of the three criteria then it is said to overheat.

1. The first criterion sets a limit for the number of hours that the operative temperature exceeds the comfort temperature by 1°C or more during the occupied hours over the summer period (1st May to 30th September).
2. The second criterion deals with the severity of the overheating within any one day. This sets a daily limit for acceptability.
3. The third criterion sets an absolute maximum daily temperature for the room.

## Project Details

Building Designer File (.tbd): Ashley Road West - Retail Units.tbd

Simulation Results File (.tsd): London\_LWC\_DSY1\_2020High50.tsd

Date: 29 June 2023

Building Category: Category II

Report Criteria: TM52

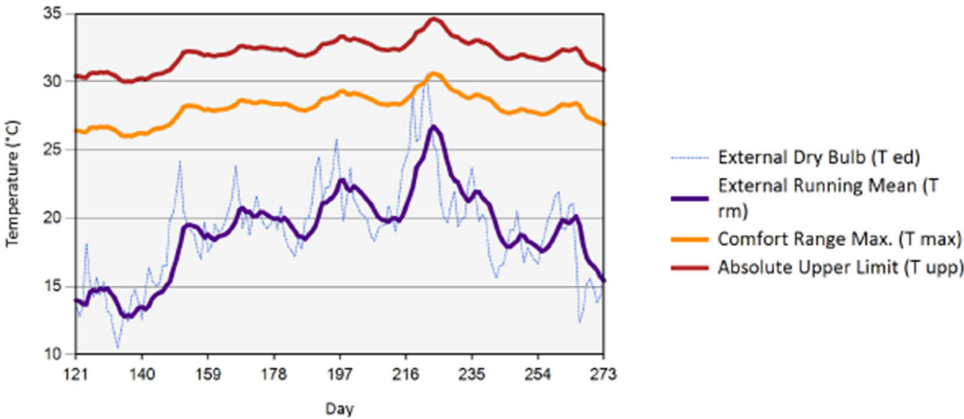
## Results

| Zone Name    | Occupied Summer Hours | Max. Exceedable Hours | Criterion 1: #Hours Exceeding Comfort Range | Criterion 2: Peak Daily Weighted Exceedance | Criterion 3: #Hours Exceeding Absolute Limit | Result |
|--------------|-----------------------|-----------------------|---------------------------------------------|---------------------------------------------|----------------------------------------------|--------|
| Tea Point    | 3672                  | 110                   | 20                                          | 5.0                                         | 0                                            | Pass   |
| Sales Area   | 1989                  | 59                    | 10                                          | 4.0                                         | 0                                            | Pass   |
| Meeting Room | 1989                  | 59                    | 27                                          | 10.0                                        | 0                                            | Pass   |
| Flexible Use | 1989                  | 59                    | 7                                           | 4.0                                         | 0                                            | Pass   |

London\_LWC\_DSY2\_2020High50.tsd

Adaptive Overheating Report (CIBSE TM52)

Adaptive Summer Temperatures for London\_LWC\_DSY2\_2020High50



The adaptive overheating assessment tests rooms against three criteria. If a room fails any two of the three criteria then it is said to overheat.

- 1. The first criterion sets a limit for the number of hours that the operative temperature exceeds the comfort temperature by 1°C or more during the occupied hours over the summer period (1st May to 30th September).
- 2. The second criterion deals with the severity of the overheating within any one day. This sets a daily limit for acceptability.
- 3. The third criterion sets an absolute maximum daily temperature for the room.

Project Details

Building Designer File (.tbd): Ashley Road West - Retail Units.tbd

Simulation Results File (.tsd): London\_LWC\_DSY2\_2020High50.tsd

Date: 29 June 2023

Building Category: Category II

Report Criteria: TM52

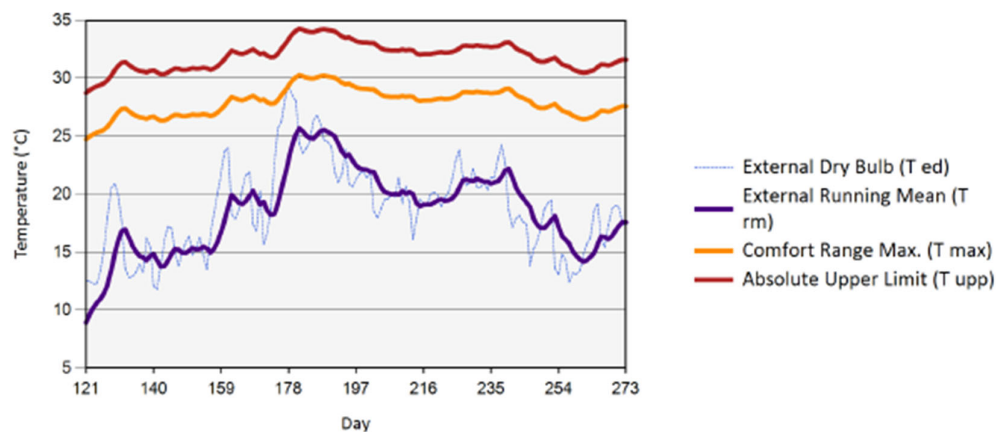
Results

| Zone Name    | Occupied Summer Hours | Max. Exceedable Hours | Criterion 1: #Hours Exceeding Comfort Range | Criterion 2: Peak Daily Weighted Exceedance | Criterion 3: #Hours Exceeding Absolute Limit | Result |
|--------------|-----------------------|-----------------------|---------------------------------------------|---------------------------------------------|----------------------------------------------|--------|
| Tea Point    | 3672                  | 110                   | 38                                          | 8.0                                         | 0                                            | Pass   |
| Sales Area   | 1989                  | 59                    | 3                                           | 2.0                                         | 0                                            | Pass   |
| Meeting Room | 1989                  | 59                    | 15                                          | 4.0                                         | 0                                            | Pass   |
| Flexible Use | 1989                  | 59                    | 0                                           | 0.0                                         | 0                                            | Pass   |

London\_LWC\_DSY3\_2020High50.tsd

## Adaptive Overheating Report (CIBSE TM52)

### Adaptive Summer Temperatures for London\_LWC\_DSY3\_2020High50



The adaptive overheating assessment tests rooms against three criteria. If a room fails any two of the three criteria then it is said to overheat.

1. The first criterion sets a limit for the number of hours that the operative temperature exceeds the comfort temperature by 1°C or more during the occupied hours over the summer period (1st May to 30th September).
2. The second criterion deals with the severity of the overheating within any one day. This sets a daily limit for acceptability.
3. The third criterion sets an absolute maximum daily temperature for the room.

### Project Details

Building Designer File (.tbd): Ashley Road West - Retail Units.tbd

Simulation Results File (.tsd): London\_LWC\_DSY3\_2020High50.tsd

Date: 29 June 2023

Building Category: Category II

Report Criteria: TM52

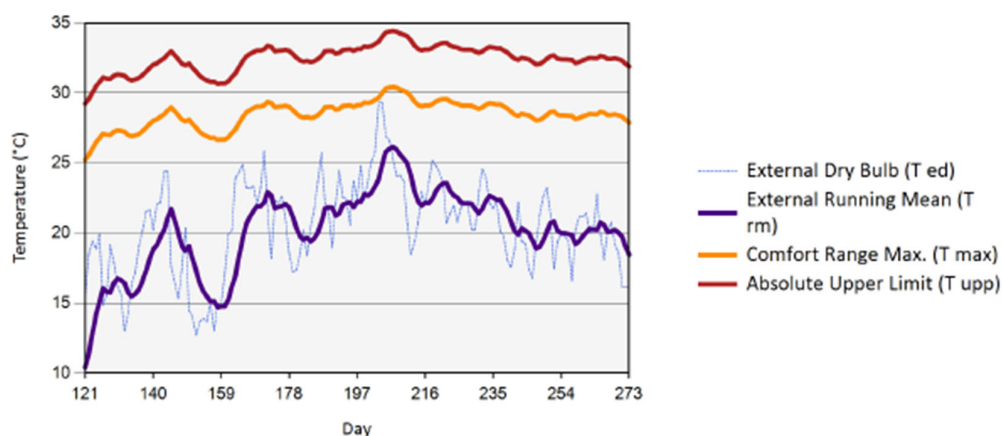
### Results

| Zone Name    | Occupied Summer Hours | Max. Exceedable Hours | Criterion 1: #Hours Exceeding Comfort Range | Criterion 2: Peak Daily Weighted Exceedance | Criterion 3: #Hours Exceeding Absolute Limit | Result |
|--------------|-----------------------|-----------------------|---------------------------------------------|---------------------------------------------|----------------------------------------------|--------|
| Tea Point    | 3672                  | 110                   | 50                                          | 7.0                                         | 0                                            | Pass   |
| Sales Area   | 1989                  | 59                    | 11                                          | 6.0                                         | 0                                            | Pass   |
| Meeting Room | 1989                  | 59                    | 27                                          | 6.0                                         | 0                                            | Pass   |
| Flexible Use | 1989                  | 59                    | 5                                           | 4.0                                         | 0                                            | Pass   |

London\_LWC\_DSY1\_2050High50.tsd

## Adaptive Overheating Report (CIBSE TM52)

### Adaptive Summer Temperatures for London\_LWC\_DSY1\_2050High50



The adaptive overheating assessment tests rooms against three criteria. If a room fails any two of the three criteria then it is said to overheat.

1. The first criterion sets a limit for the number of hours that the operative temperature exceeds the comfort temperature by 1°C or more during the occupied hours over the summer period (1st May to 30th September).
2. The second criterion deals with the severity of the overheating within any one day. This sets a daily limit for acceptability.
3. The third criterion sets an absolute maximum daily temperature for the room.

### Project Details

Building Designer File (.tbd): Ashley Road West - Retail Units.tbd

Simulation Results File (.tsd): London\_LWC\_DSY1\_2050High50.tsd

Date: 29 June 2023

Building Category: Category II

Report Criteria: TM52

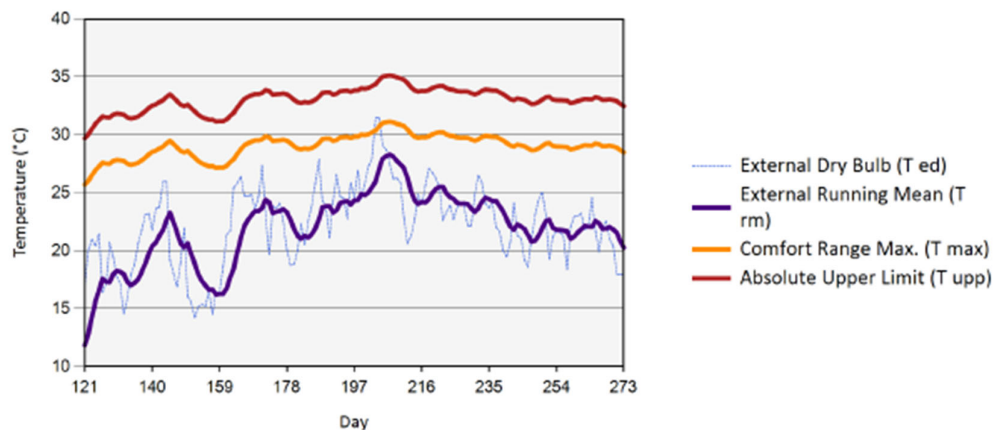
### Results

| Zone Name    | Occupied Summer Hours | Max. Exceedable Hours | Criterion 1: #Hours Exceeding Comfort Range | Criterion 2: Peak Daily Weighted Exceedance | Criterion 3: #Hours Exceeding Absolute Limit | Result |
|--------------|-----------------------|-----------------------|---------------------------------------------|---------------------------------------------|----------------------------------------------|--------|
| Tea Point    | 3672                  | 110                   | 33                                          | 5.0                                         | 0                                            | Pass   |
| Sales Area   | 1989                  | 59                    | 5                                           | 3.0                                         | 0                                            | Pass   |
| Meeting Room | 1989                  | 59                    | 15                                          | 8.0                                         | 0                                            | Pass   |
| Flexible Use | 1989                  | 59                    | 4                                           | 4.0                                         | 0                                            | Pass   |

London\_LWC\_DSY1\_2080High50.tsd

## Adaptive Overheating Report (CIBSE TM52)

### Adaptive Summer Temperatures for London\_LWC\_DSY1\_2080High50



The adaptive overheating assessment tests rooms against three criteria. If a room fails any two of the three criteria then it is said to overheat.

1. The first criterion sets a limit for the number of hours that the operative temperature exceeds the comfort temperature by 1°C or more during the occupied hours over the summer period (1st May to 30th September).
2. The second criterion deals with the severity of the overheating within any one day. This sets a daily limit for acceptability.
3. The third criterion sets an absolute maximum daily temperature for the room.

### Project Details

Building Designer File (.tbd): Ashley Road West - Retail Units.tbd

Simulation Results File (.tsd): London\_LWC\_DSY1\_2080High50.tsd

Date: 29 June 2023

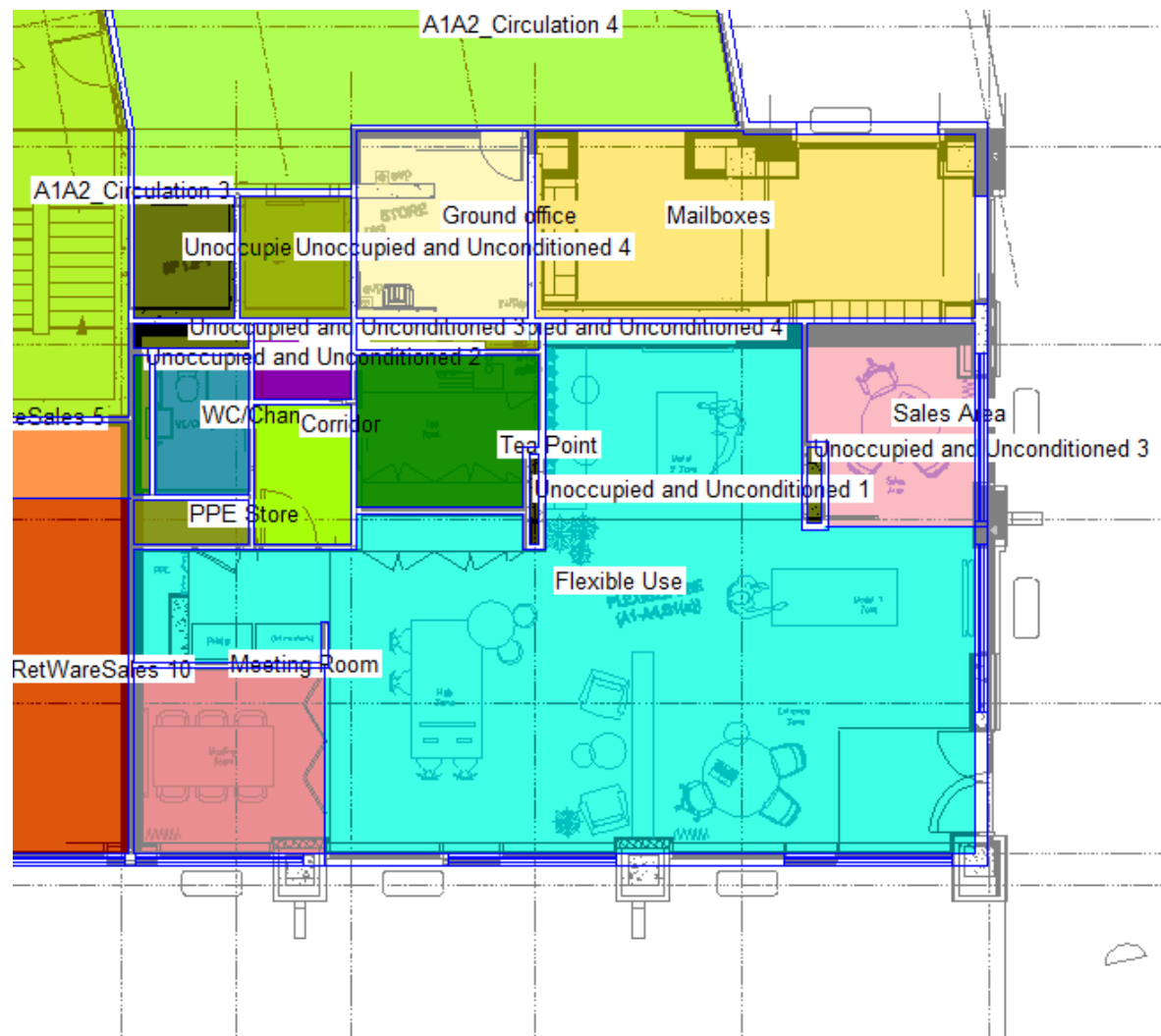
Building Category: Category II

Report Criteria: TM52

### Results

| Zone Name    | Occupied Summer Hours | Max. Exceedable Hours | Criterion 1: #Hours Exceeding Comfort Range | Criterion 2: Peak Daily Weighted Exceedance | Criterion 3: #Hours Exceeding Absolute Limit | Result |
|--------------|-----------------------|-----------------------|---------------------------------------------|---------------------------------------------|----------------------------------------------|--------|
| Tea Point    | 3672                  | 110                   | 44                                          | 7.0                                         | 0                                            | Pass   |
| Sales Area   | 1989                  | 59                    | 4                                           | 2.0                                         | 0                                            | Pass   |
| Meeting Room | 1989                  | 59                    | 6                                           | 4.0                                         | 0                                            | Pass   |
| Flexible Use | 1989                  | 59                    | 1                                           | 1.0                                         | 0                                            | Pass   |

## APPENDIX B: TAS FLOOR PLANS



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**APPENDIX C: TAS 3D IMAGES**

