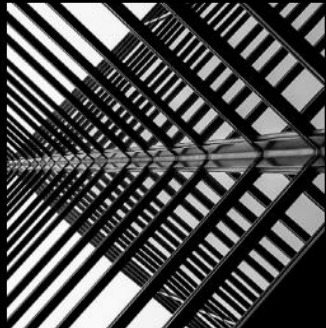


TM59 OVERHEATING ASSESSMENT ROYAL BRUNSWICK PARK

2548-MKP-SW-ZZ-RP-1002-P2



TM59 OVERHEATING ASSESSMENT

for the development at ROYAL BRUNSWICK PARK
on behalf of Comer Group

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All findings and calculations included within this report have been produced based on information supplied by the Client (Comer Group) and the design team.

ISSUE REFERENCE	ISSUE DATE	STATUS
P2	August 2021	Preliminary

Contents

1.	Executive Summary.....	1
2.	Introduction.....	2
3.	Site Description	3
4.	Assessment Methodology	4
5.	Compliance Criteria	5
6.	Thermal Modelling Inputs	6
6.1	Weather Data	6
6.2	Building Fabric (U-values).....	6
6.3	Internal gains analysis.....	7
6.4	Ventilation	9
7.	Simulation Results.....	11
8.	Conclusions and Recommendations.....	17

1. Executive Summary

MKP Consulting Ltd has been instructed by the Client (Comer Group) to carry out a TM59 overheating assessment for Block D on Royal Brunswick Park, Borough of Barnet, London.

This TM59 Overheating Assessment outlines the passive and active design measures taken in order to ensure that the risk of overheating has been minimized and that the strategy:

- Follows the methodology set out in CIBSE TM59 and complies with the overheating criteria.
- Considers CIBSE Guide A and CIBSE TM52.
- Follows design criteria and information provided by MKP.
- Aligns with the London Plan's cooling hierarchy and the Mayor's Sustainable Design and Construction Supplementary Planning Guidance requirements.
- Addresses the requirements of the Greater London Authority (GLA's) Guidance on Preparing Energy Assessments for Planning Applications (2018).

The results indicate that by adopting the proposed strategy all assessed flat and corridors comply with the requirements of the CIBSE TM59 methodology.

2. Introduction

Climate change includes both global warming driven by human-induced emissions of greenhouse gases and the resulting large-scale shifts in weather patterns. Due to human activities such as burning fossil fuels and cutting down trees, greenhouse gases have increased and so increased the heat trapped in the atmosphere.

The effects of climate change can be seen in the UK and around the world. UK temperatures have already risen and globally, extreme weather is predicted to become more common and to have a negative impact on humans, animals and plants.

The term overheating refers to discomfort to occupants caused by the accumulation of warmth within a building and it is an ever-growing problem in the UK.

The problem of overheating in buildings is made worse in cities, due to the urban heat island effect, as buildings and man-made surfaces generally absorb more heat than the natural surfaces they replaced. With climate change models predicting an increase in UK summer temperatures, it is an issue that will only grow in its significance to building design.

Although climate change is essentially the main driver behind the temperature increase, one key reason for overheating in buildings is the improved building fabric standards, which are designed keep the building warm in winter, but prevent a building effectively losing heat during summer.

It is a complex issue that is affected by a wide range of issues, such as increased amounts of glazing on modern buildings which allow more solar radiation in, or lightweight constructions which are prone to large fluctuations in temperature.

It is not even simple to define what counts as overheating in buildings, as comfort temperature levels can be subjective and vary in each occupant based on factors such as activity level, clothing, and humidity.

Therefore, it becomes critical to assess the risk of overheating at the early stages of the design process to avoid any expensive modifications to the design at later stages of the development process.

This TM59 Overheating Assessment has been prepared by MKP Consulting Ltd for the residential development of Block D on Royal Brunswick Park, Borough of Barnet, London.

This report follows the steps proposed by the CIBSE TM59 guidance 'Design methodology for the assessment of overheating risk in homes'.

For this assessment, the IES <VE> 2021 software has been used. A sample number of dwellings and one internal communal residential corridor have been modelled and the risk of overheating assessed under current climate conditions.

3. Site Description

The site occupies circa 17 hectares of brownfield land in a predominantly residential area, located to the west of Southgate and to the south of East Barnet. The site is a pre-developed site, with circa 13 hectares of the site being occupied by grasslands, an attenuation lake and unplanned vegetative cover.

The site is in the London Borough of Barnet, approximately 8 miles to the north-west of Central London. The site lies slightly outside of the circular route prescribed by the A406 North Circular Road.

Proposals are for the phased comprehensive redevelopment of the North London Business Park to deliver a residential-led mixed use development. The detailed element comprises up to 466 residential units in five blocks reaching 9 storeys, the provision of a 5 form entry secondary school, a gymnasium, a multi-use sports pitch and associated changing facilities and improvements to open space and transport infrastructure, including improvements to the access from Brunswick Park Road and; the outline element comprises up to 1,967 additional residential units in buildings ranging from three to twelve storeys, up to 7,148 sqm of non-residential floor space (use Class E) and 20,250sqm of open space. Associated site preparation/enabling work, transport infrastructure and junction work, landscaping and car parking.

The design framework for all associated site works, landscaped areas (including New Brunswick Park), transport infrastructure and car parking required to support the delivery of the Outline Planning Area (Phases 2-5) is described in Plus Architecture's Parameter Plans and Design Principles Document, which accompanied the Outline Planning Area (Phases 2 to 5).



Site Location and Map

4. Assessment Methodology

For the assessment of overheating risk of Block D on Royal Brunswick Park, London a Dynamic Thermal Model has been created using the approved software IES-VE 2021 latest version.

A sample of 10 apartments/flats and 1 communal corridor have been selected to be assessed based on a worst-case scenario for units being at high risk of overheating. Factors affecting the dwelling selection are:

- South facing
- Large glazing areas
- Less shading
- Middle floor flats (heat transfer in between the floors)
- Top floor (exposed roof)

A mark up of all the assessed flats and corridors is provided in Appendix 1.



CGI of Proposed Development

5. Compliance Criteria

The overheating assessment approach is based on the CIBSE TM59 Methodology, which is an approach that aims to encourage good design and proposes a standardised process for assessing overheating in residential properties, that would be common across the industry.

It proposes typical profiles to describe the internal gains through occupancy, lighting and equipment.

Compliance criteria is predominantly based on the mean and level of ventilation of the development. A predominately naturally ventilated development includes apartments with MVHR & MEV but with good opportunities for natural ventilation in the summer (via openable windows). A predominately mechanically ventilated development has either no opportunity or extremely limited opportunities for window opening.

- **For homes predominantly naturally ventilated**

Compliance is met by passing both criteria a and b

- a. The number of hours for living rooms, kitchens and bedrooms, for which the difference between the internal and external temperatures (ΔT) 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 the occupied hours (TM52 criterion 1).
- b. For bedrooms only, to guarantee comfort during the sleeping hours the operative temperature from 10pm to 7am shall not exceed 26°C for more than 30 hours.

- **For homes predominantly mechanically ventilated**

The CIBSE Guide A 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 hours.

- **Communal corridors**

Corridors should demonstrate that an operative temperature of 28°C should not be exceeded for more than 3% of the total annual hours.

The proposed development is considered predominantly naturally ventilated and therefore has been assessed against the relevant CIBSE TM59 criteria.

6. Thermal Modelling Inputs

For the purpose of this overheating assessment a sample of 10 apartments/flats and 1 communal corridor have been selected to be assessed based on a worst-case scenario for units being at high risk of overheating. This section of the report outlines and analyses the input used in order to undertake this overheating assessment.

6.1 Weather Data

For the assessment of the risk of overheating the London CIBSE Design Summer Year (DSY1) for the 2020s, high emissions, 50% percentile scenario has been used as required in the CIBSE TM59 methodology. As part of the modelling to comply with the London Plan, additional testing has been undertaken using the 2020 versions of the following more extreme design weather years:

DSY2 – 2003: a year with a very intense single warm spell.

DSY3 – 1976: a year with a prolonged period of sustained warmth.

It is acknowledged that meeting the CIBSE compliance criteria is challenging for the DSY 2 & 3 weather files, although in most cases a significant proportion of spaces will be able to achieve compliance as passive measures have been included.

6.2 Building Fabric (U-values)

The existing façade at 1st, 2nd & 3rd floor levels will be fully refurbished to comply with current standards with new brick cladding, thermal insulation, windows, and sound insulation between floors, to match the 4th, 5th & 6th floors which will be all new structures in full compliance with Building Regulations & The London Plan 2021.

Since the development is in the pre-planning stage, the exact construction details have not been finalised and for the purpose of undertaking a preliminary TM59 overheating analysis, the u-values presented in table 1 below are used:

Element	U-Value (W/m ² K)
External Wall U-Value (W/m ² .K)	0.16
Ground Floor (W/m ² .K)	0.11
Roof U-value (W/m ² .K)	0.12
Windows - Glazing U-Value, including frame (W/m ² .K) / g value	1.40 / 0.3
Glazing Doors U-Value, including frame (W/m ² .K) / g value	1.2 / 0.3

Table 1 U-Values

6.3 Internal gains analysis

Occupancy internal gains

As per the CIBSE TM59 guidance, occupancy maximum sensible and latent gains should be equal to 75W/person and 55W/person in all living spaces.

For communal corridors since they cannot be considered as living spaces, the occupancy gains are assumed to be equal to zero.

A summary of the occupancy gains as required by CIBSE TM59 is provided below in table 2.

Number of People	Description	Peak Load (W)		Hours of Occupancy	Percentage of Load
		Sensible	Latent		
2	Double Bedroom	150	110	23:00 – 08:00	0.7
				08:00 – 09:00	1
				09:00 – 22:00	0.5
				22:00 – 23:00	1
2	2 Bed – Living Room / Kitchen	150	110	09:00 – 22:00	1
3	3 Bed – Living Room / Kitchen	150	110	09:00 – 22:00	1

Table 2 Occupancy internal gains

As per the CIBSE TM59 guidance, lighting gain is assumed to be 2 W/m² and will be operating from 18:00 till 23:00.

For communal corridors, the same value should be assumed unless lighting is controlled by PIR sensors where it should be assumed to be 0 W/m².

Equipment internal gains

Equipment internal gains must be equal and in accordance with CIBSE TM59 Guidance. Table 3 below outlines the equipment gains used for this assessment.

Description	Peak Load (W)	Hours of Occupancy	Percentage of Load
Double Bedroom	80	23:00 – 08:00	0.13
		08:00 – 23:00	1
Living Room / Kitchen	450	00:00 – 09:00	0.19
		09:00 – 18:00	0.24
		18:00 – 20:00	1
		20:00 – 22:00	0.44
		22:00 – 24:00	0.24
		18:00 – 20:00	1
		20:00 – 24:00	0.17

Table 3 Equipment Internal gains

6.4 Ventilation

Natural Ventilation

Royal Brunswick Park Block D residential development is considered predominately naturally ventilated and the windows are openable in accordance with CIBSE TM59 Guidance.

The windows will be fully openable only when the internal dry bulb temperature is equal to or greater than 20°C, and when the internal temperature is greater or equal than the external temperature. The windows have the ability to open on a 24hr basis and based upon occupant's comfort.

Sliding doors and lounge doors will have the same openable operative conditions.

Windows and doors will have the following opening properties:

- W1. Sliding Doors – 95% openable area
- W2. Glazing Doors - 95% openable area with 90deg. angle
- W3. Main Side Window arrangement - 95% openable area with 30deg. angle resulting in an orifice opening area of 50%
- W4. 4 pane windows (West elevation) – 95% openable area with 12deg angle (top hung) resulting in an orifice opening area of 57%
- Infiltration is assumed to be 0.25 ach/hr on a continuously mode.
- No blinds are included.

Images 3, 4, 5, 6 below visually display the different types of window opening for better understanding.

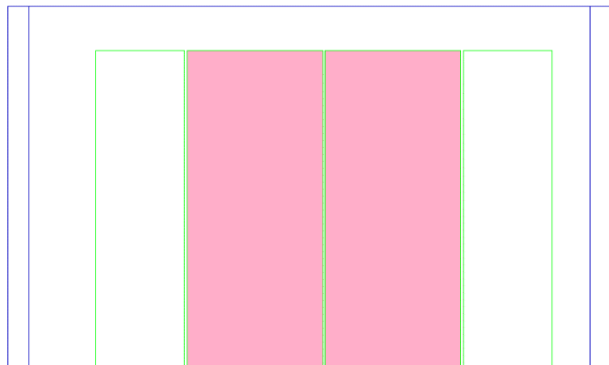


Image 3 W1.opening arrangement – Sliding doors

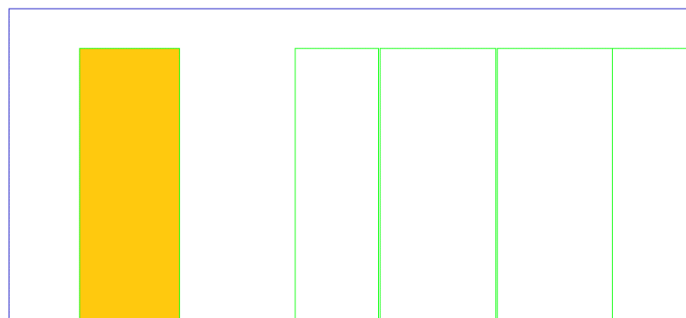


Image 4 W2.opening arrangement – Glazing doors

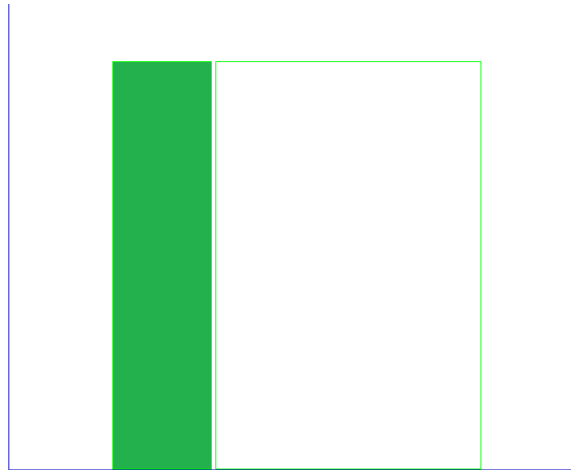


Image 5 W3.opening arrangement – main side window

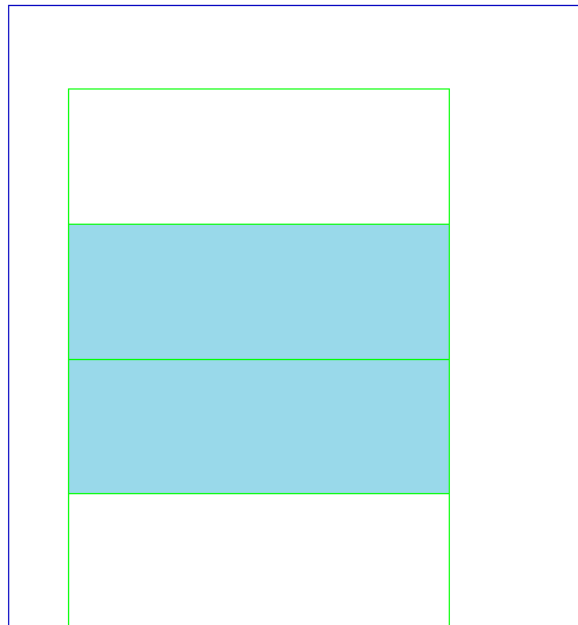


Image 6 W4.opening arrangement – 4 pane window

Mechanical Ventilation

The flats/apartments on Block D Royal Brunswick Park residential development use MVHR for additional ventilation on the 1st floor only. MEV is used on floors 2-6. The rates in litres/second are presented below:

- Bedrooms use 10l/s from 22:00 to 09:00
- Living areas use 20l/s from 16:00 to 23:00

7. Simulation Results

This section presents the simulation results for Block D Royal Brunswick Park residential development TM59 Overheating Assessment. As mentioned below the development is considered predominately naturally ventilated, therefore compliance is assessed against the following criteria:

- a. The number of hours for living rooms, kitchens and bedrooms, for which the difference between the internal and external temperatures (ΔT) 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 the occupied hours (TM52 criterion 1). Table 4 presents the results against this criterion.

Unit	Plot ID	Criterion 1 (%Hrs Top-Tmax>=1 K)	Criterion 2 (Max. Daily Deg.Hrs)	Criterion 3 (Max. DeltaT)	Compliance with Criterion 1 of CIBSE TM52
00 - FLAT 1 - KLD	5	2.5	17	3	✓
01 - FLAT 1 - BED	0000000C	1.8	31	4	✓
01 - FLAT 1 - KLD	0000000D	2.6	24	3	✓
01 - FLAT 2 - BED 1	0000000E	0	0	0	✓
01 - FLAT 2 - BED 2	16	2.3	30	4	✓
01 - FLAT 2 - BED 3	10	0.7	14	2	✓
01 - FLAT 2 - KLD	14	0	0	0	✓
03 - FLAT 1 - BED 2	27	1.6	29	3	✓
03 - FLAT 1 - BED 1	0000001A	1.2	24	3	✓
03 - FLAT 1 - KLD	36	1.7	13	3	✓
03 - FLAT 2 - BED 2	55	2.3	25	4	✓
03 - FLAT 2 - BED 1	57	1.7	19	4	✓
03 - FLAT 2 - KLD	0000005A	0.4	5	2	✓
04 - FLAT 1 - BEDROOM	0000006D	2.6	32	4	✓
04 - FLAT 1 - KLD	0000006E	0.4	4	1	✓
05 - FLAT 1 - BED 1	0000007E	1.9	19	4	✓
05 - FLAT 1 - KLD	0000008C	2.4	18	3	✓
07 - FLAT 1 - BED 2	000000B7	0.8	14	2	✓

07 - FLAT 1 - BED 1	000000B2	0.1	2	1	✓
07 - FLAT 1 - BED 1 REDUNDANT ROOM	000000B8	0.4	6	1	✓
07 - FLAT 1 - KLD	000000B9	0.1	1	1	✓
09 - FLAT 1 - BED 1	1000036	0.4	6	1	✓
09 - FLAT 1 - KLD	1000037	2.7	24	3	✓
09 - FLAT 1 - BED 2	1000039	1	20	3	✓
09 - FLAT 2 - KLD	000000D C	2.9	23	3	✓
00 - FLAT 1 - BED 1	3	2	32	5	✓
00 - FLAT 1 - BED 2	1	2.1	35	5	✓
03 - FLAT 2 - BED 3	51	2.9	30	5	✓
05 - FLAT 1 - BED 2	0000008 A	2.8	41	6	✓
09 - FLAT 2 - BEDROOM	000000D A	2.1	37	5	✓

Table 4 Compliance with Cr. 1 of CIBSE TM52 Guidance

- b. For bedrooms only, to guarantee comfort during the sleeping hours the operative temperature from 10pm to 7am shall not exceed 26°C for more than 33hours.

Unit	Annual Occupied Hours	Hours Operative Temperature Exceeds 26C	Compliance CIBSE TM59 Bedrooms Requirement
00 - FLAT 1 - BED 1	3672	13	✓
00 - FLAT 1 - BED 2	3672	13	✓
01 - FLAT 1 - BED	3672	25	✓
01 - FLAT 2 - BED 1	3672	17	✓
01 - FLAT 2 - BED 2	3672	29	✓
01 - FLAT 2 - BED 3	3672	23	✓
03 - FLAT 1 - BED 2	3672	29	✓
03 - FLAT 1 - BED 1	3672	26	✓
03 - FLAT 2 - BED 3	3672	25	✓
03 - FLAT 2 - BED 2	3672	26	✓
03 - FLAT 2 - BED 1	3672	24	✓
04 - FLAT 1 - BEDROOM	3672	29	✓
05 - FLAT 1 - BED 2	3672	14	✓
05 - FLAT 1 - BED 1	3672	26	✓
07 - FLAT 1 - BED 2	3672	13	✓
07 - FLAT 1 - BED 1	3672	16	✓
07 - FLAT 1 - BED 1 REDUNDANT ROOM	3672	12	✓
09 - FLAT 1 - BED 1	3672	21	✓

09 - FLAT 1 - BED 2	3672	25	✓
09 - FLAT 2 - BEDROOM	3672	13	✓

Table 5 Compliance with Cr. 2 of CIBSE TM59 predominately naturally ventilated buildings

In line with the CIBSE TM49 and the GLA's requirements, the development has also been assessed under DSY2 and DSY3.

The results show that there is overheating risk under DSY2 and DSY3, however, compliance with these weather files is not a requirement.

TM59 Assessment – DSY02 Weather file

Unit	Plot ID	Criterion 1 (%Hrs Top-Tmax>=1 K)	Criterion 2 (Max. Daily Deg.Hrs)	Criterion 3 (Max. DeltaT)	Compliance with Criterion 1 of CIBSE TM52
01 - FLAT 2 - BED 1	0000000E	0.4	7	1	✓
01 - FLAT 2 - BED 3	10	1.5	23	4	✓
01 - FLAT 2 - KLD	14	1.5	15	3	✓
03 - FLAT 1 - BED 1	0000001A	2.3	39	4	✓
03 - FLAT 1 - KLD	36	1.9	15	3	✓
03 - FLAT 2 - KLD	0000005A	1.8	20	3	✓
04 - FLAT 1 - KLD	0000006E	1	8	3	✓
07 - FLAT 1 - BED 2	000000B7	1.7	25	4	✓
07 - FLAT 1 - BED 1	000000B2	0.7	13	2	✓
07 - FLAT 1 - BED 1 REDUNDANT ROOM	000000B8	0.8	16	3	✓
07 - FLAT 1 - KLD	000000B9	0.9	7	2	✓
09 - FLAT 1 - BED 1	1000036	0.8	13	2	✓
09 - FLAT 1 - BED 2	1000039	1.9	29	4	✓
00 - FLAT 1 - BED 1	3	2.5	47	7	✓
00 - FLAT 1 - BED 2	1	2.7	53	8	✓
00 - FLAT 1 - KLD	5	4	33	5	✗
01 - FLAT 1 - BED	0000000C	2.8	50	7	✗
01 - FLAT 1 - KLD	0000000D	4.2	42	6	✗

01 - FLAT 2 - BED 2	16	3.2	48	7	x
03 - FLAT 1 - BED 2	27	2.8	46	5	x
03 - FLAT 2 - BED 3	51	3.1	40	7	x
03 - FLAT 2 - BED 2	55	2.7	33	6	x
03 - FLAT 2 - BED 1	57	1.9	25	5	x
04 - FLAT 1 - BEDROOM	0000006 D	3.3	49	7	x
05 - FLAT 1 - BED 2	0000008 A	3.2	58	8	x
05 - FLAT 1 - BED 1	0000007E	2.2	23	5	x
05 - FLAT 1 - KLD	0000008C	4.1	33	5	x
09 - FLAT 1 - KLD	1000037	4.4	40	6	x
09 - FLAT 2 - BEDROOM	000000D A	2.8	54	8	x
09 - FLAT 2 - KLD	000000D C	4.4	38	6	x

Table 6 Compliance with Cr. 1 of CIBSE TM52 Guidance (DSY02)

Unit	Annual Occupied Hours	Hours Operative Temperature Exceeds 26C	Compliance CIBSE TM59 Bedrooms Requirement
00 - FLAT 1 - BED 1	3672	20	✓
00 - FLAT 1 - BED 2	3672	20	✓
01 - FLAT 1 - BED	3672	37	x
01 - FLAT 2 - BED 1	3672	32	✓
01 - FLAT 2 - BED 2	3672	46	x
01 - FLAT 2 - BED 3	3672	37	✓
03 - FLAT 1 - BED 2	3672	43	x
03 - FLAT 1 - BED 1	3672	42	x
03 - FLAT 2 - BED 3	3672	37	x
03 - FLAT 2 - BED 2	3672	37	x
03 - FLAT 2 - BED 1	3672	35	x
04 - FLAT 1 - BEDROOM	3672	49	x
05 - FLAT 1 - BED 2	3672	20	✓
05 - FLAT 1 - BED 1	3672	35	x
07 - FLAT 1 - BED 2	3672	17	✓
07 - FLAT 1 - BED 1	3672	27	✓
07 - FLAT 1 - BED 1 REDUNDANT ROOM	3672	17	✓
09 - FLAT 1 - BED 1	3672	34	x
09 - FLAT 1 - BED 2	3672	38	x

09 - FLAT 2 - BEDROOM	3672	20	✓
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Table 7 Compliance with Cr. 2 of CIBSE TM59 predominately naturally ventilated buildings DSY02

TM59 Assessment – DSY03 Weather file

Unit	Plot ID	Criterion 1 (%Hrs Top-Tmax>=1 K)	Criterion 2 (Max. Daily Deg.Hrs)	Criterion 3 (Max. DeltaT)	Compliance with Criterion 1 of CIBSE TM52
01 - FLAT 2 - BED 1	0000000E	0.7	13	2	✓
01 - FLAT 2 - BED 3	10	2.3	33	4	✓
01 - FLAT 2 - KLD	14	1.3	12	2	✓
03 - FLAT 2 - KLD	0000005A	2	22	3	✓
04 - FLAT 1 - KLD	0000006E	1.3	12	3	✓
07 - FLAT 1 - BED 2	000000B7	2.4	35	4	✓
07 - FLAT 1 - BED 1	000000B2	0.9	19	3	✓
07 - FLAT 1 - BED 1 REDUNDANT ROOM	000000B8	1.3	23	3	✓
07 - FLAT 1 - KLD	000000B9	1	10	2	✓
09 - FLAT 1 - BED 1	1000036	1.2	23	3	✓
00 - FLAT 1 - BED 1	3	3.9	53	6	✓
00 - FLAT 1 - BED 2	1	3.9	56	6	✓
00 - FLAT 1 - KLD	5	5.7	30	4	✓
01 - FLAT 1 - BED	0000000C	4	52	6	✓
01 - FLAT 1 - KLD	0000000D	6.3	44	5	✓
01 - FLAT 2 - BED 2	16	4.1	54	6	✗
03 - FLAT 1 - BED 2	27	4	58	5	✗
03 - FLAT 1 - BED 1	0000001A	3.6	49	4	✗
03 - FLAT 1 - KLD	36	4.1	34	6	✗
03 - FLAT 2 - BED 3	51	4.3	55	7	✗
03 - FLAT 2 - BED 2	55	3.9	49	6	✗
03 - FLAT 2 - BED 1	57	3.1	41	6	✗

04 - FLAT 1 - BEDROOM	0000006 D	4.3	57	6	x
05 - FLAT 1 - BED 2	0000008 A	4.6	60	7	x
05 - FLAT 1 - BED 1	0000007E	3.3	36	5	x
05 - FLAT 1 - KLD	0000008C	5.6	33	4	x
09 - FLAT 1 - KLD	1000037	6.2	45	5	x
09 - FLAT 1 - BED 2	1000039	2.8	43	5	x
09 - FLAT 2 - BEDROOM	000000D A	4	57	6	x
09 - FLAT 2 - KLD	000000D C	5.9	42	5	x

Table 8 Compliance with Cr. 1 of CIBSE TM52 Guidance (DSY03)

Unit	Annual Occupied Hours	Hours Operative Temperature Exceeds 26C	Compliance CIBSE TM59 Bedrooms Requirement
00 - FLAT 1 - BED 1	3672	33	x
00 - FLAT 1 - BED 2	3672	29	✓
01 - FLAT 1 - BED	3672	55	x
01 - FLAT 2 - BED 1	3672	47	x
01 - FLAT 2 - BED 2	3672	70	x
01 - FLAT 2 - BED 3	3672	55	x
03 - FLAT 1 - BED 2	3672	70	x
03 - FLAT 1 - BED 1	3672	67	x
03 - FLAT 2 - BED 3	3672	54	x
03 - FLAT 2 - BED 2	3672	56	x
03 - FLAT 2 - BED 1	3672	55	x
04 - FLAT 1 - BEDROOM	3672	72	x
05 - FLAT 1 - BED 2	3672	36	x
05 - FLAT 1 - BED 1	3672	57	x
07 - FLAT 1 - BED 2	3672	28	✓
07 - FLAT 1 - BED 1	3672	45	x
07 - FLAT 1 - BED 1 REDUNDANT ROOM	3672	27	✓
09 - FLAT 1 - BED 1	3672	53	x
09 - FLAT 1 - BED 2	3672	58	x
09 - FLAT 2 - BEDROOM	3672	30	✓

Table 9 Compliance with Cr. 2 of CIBSE TM59 predominately naturally ventilated buildings DSY03

8. Conclusions and Recommendations

This TM59 Overheating Assessment demonstrates that Block D on Royal Brunswick Park Residential development satisfies:

- CIBSE TM59 methodology and relevant overheating criteria.

In line with the CIBSE TM49 and the GLA's requirements, the development has also been assessed under DSY2 and DSY3. The results show that there is overheating risk under DSY2 and DSY3, however, compliance with these weather files is not a requirement.

The proposed scheme incorporates the following passive measures:

- Improved glazing g-value
- Mechanical Ventilation with Heat Recovery (MVHR) and MEV
- Balconies that can create shading
- Openable windows and doors
- The overheating results show that the development successfully complies with the Overheating criteria set out in CIBSE TM59 for predominantly naturally ventilated buildings under DSY1.

APPENDIX 1 – IES VE 2021 THERMAL MODEL AND SAMPLE APARTMENTS

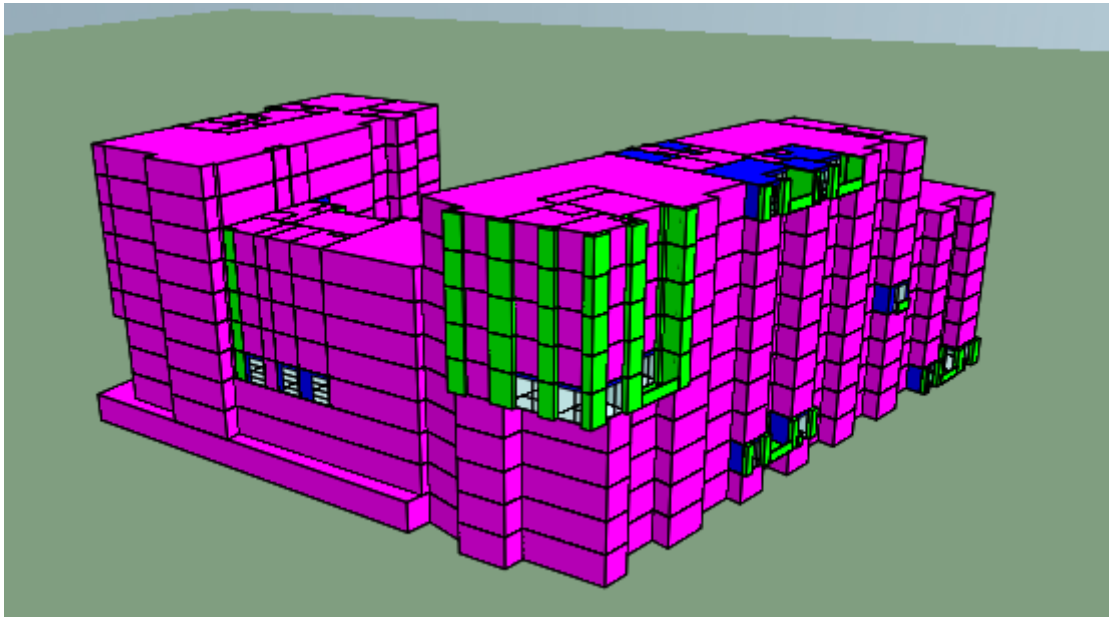


Image 4 IES VE 2021 Thermal modelling

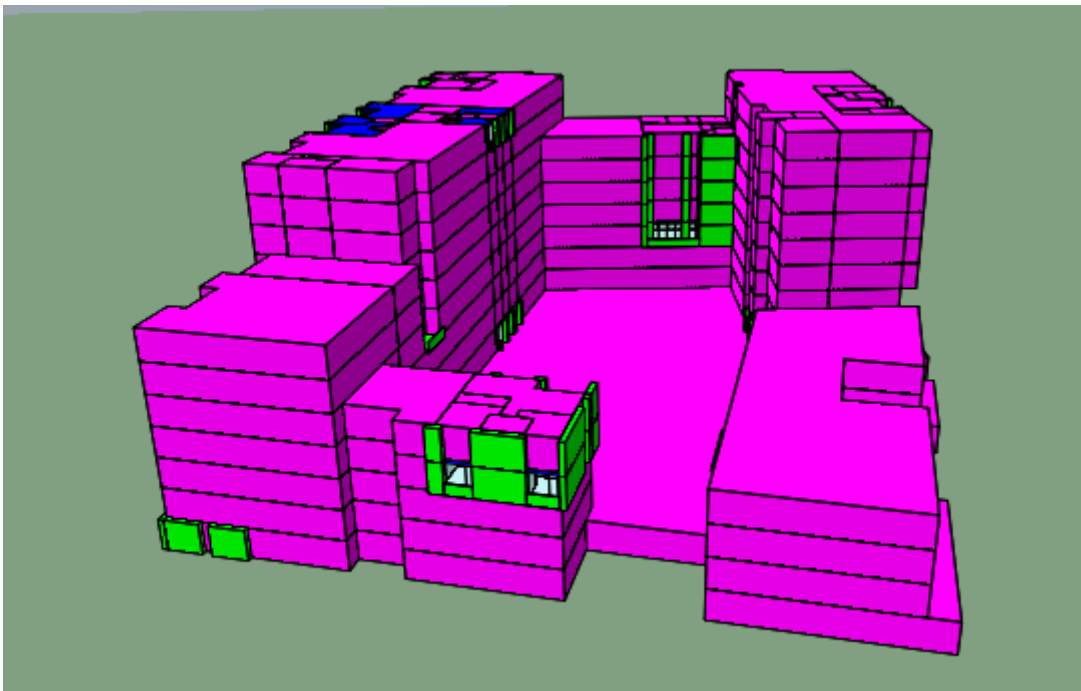
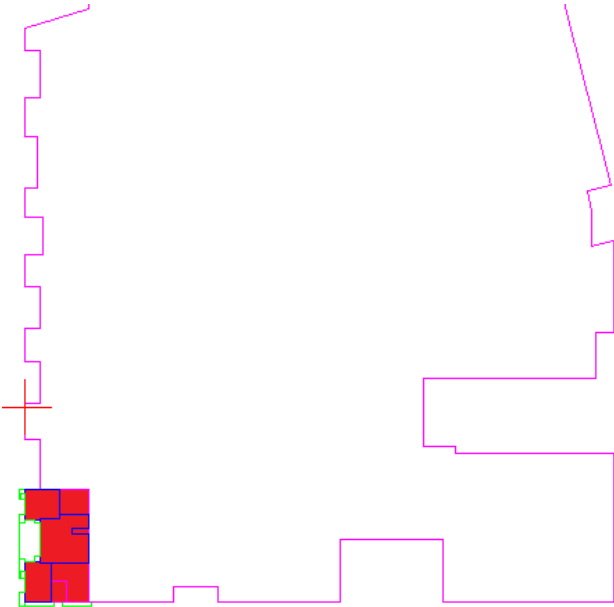
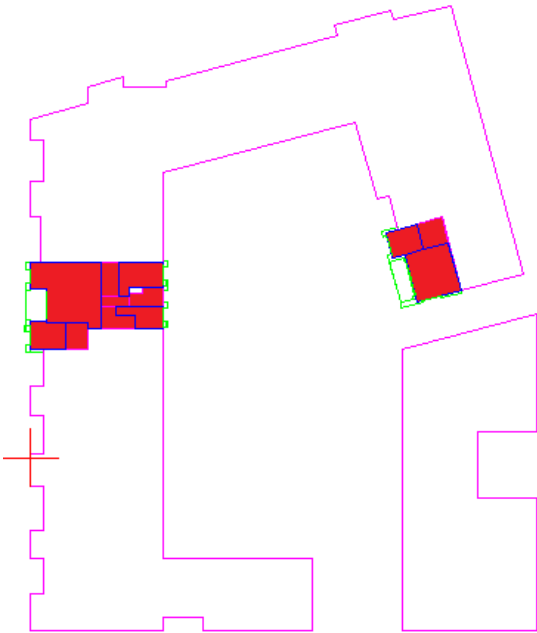


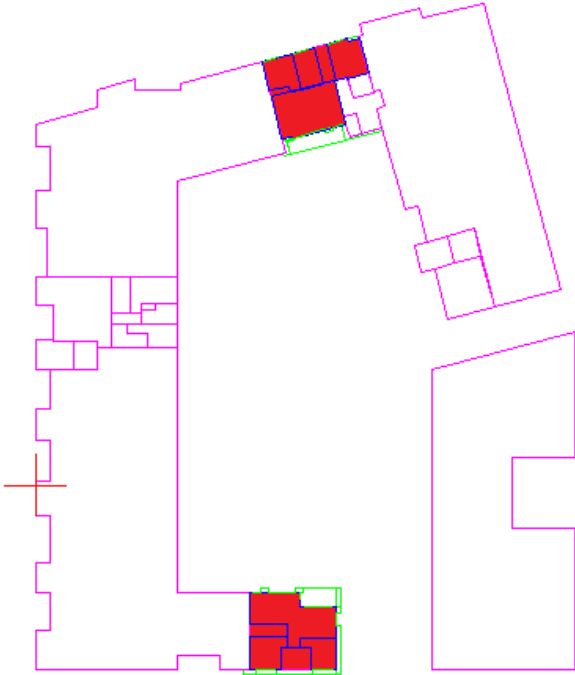
Image 5 IES VE 2021 Thermal modelling



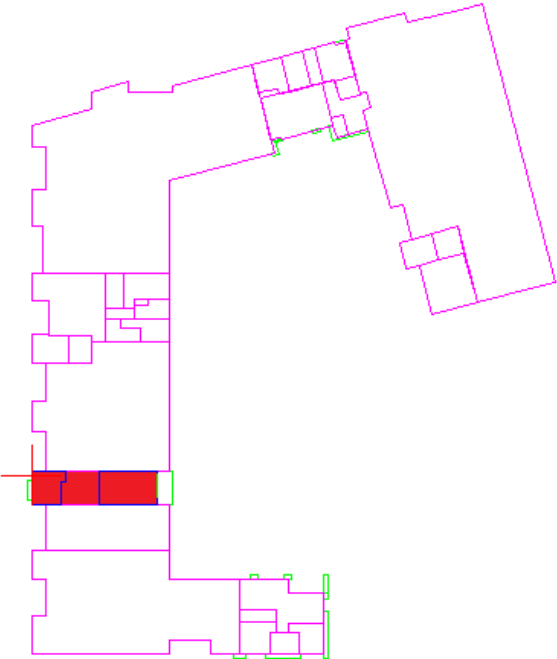
Ground Floor sample apartment



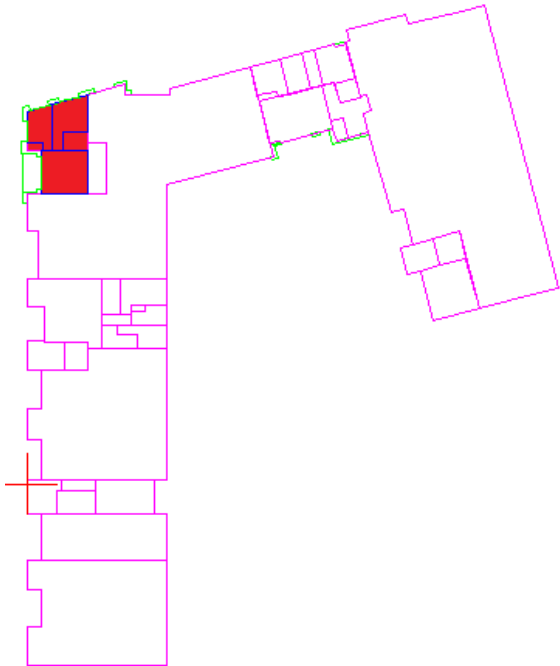
1st Floor sample apartments



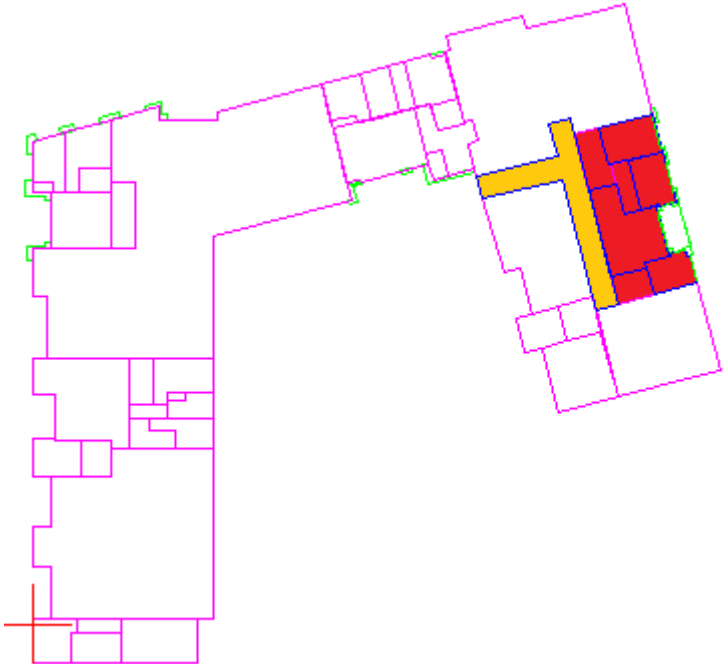
3rd Floor sample apartments



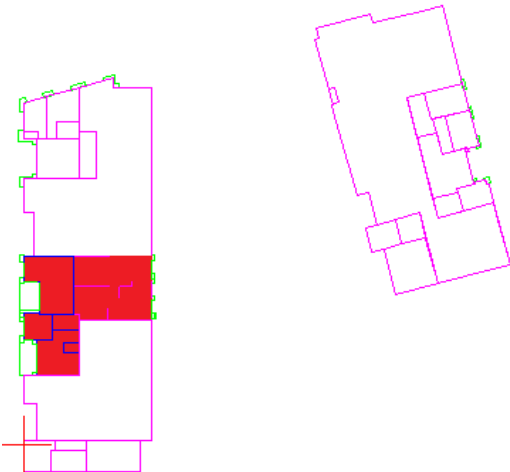
4th Floor sample apartment



5th Floor sample apartment



7th Floor sample apartments and corridor



9th Floor sample apartments and corridor



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