

Overheating Assessment and Analysis

Omega Works 1

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Overheating Assessment and Analysis Omega Works 1

Introduction

Consolux M&E Consulting has been appointed to undertake an overheating analysis of the Omega Works 1 scheme in order to provide design stage guidance and maximise occupant comfort levels. Consequently, thermal modelling has been undertaken to demonstrate TM59 requirements. The current proposal is to minimise overheating risk by following the Cooling Hierarchy.

Building Summary

The Omega Works 1 scheme consists of blocks A, B and C which include commercial units on the ground floor and residential apartments above.

Planning Context

This report complies with national guidance of conservation of fuel and power and all relevant overheating assessment publications, such as CIBSE's TM48, TM52 and TM59. The thermal model was created using DesignBuilder, one of the software approved by the UK government for DSM.

Methodology

The methodology used within this report has been to establish the thermal comfort levels in the occupied spaces through using dynamic simulation modelling. All assumptions in the modelling are provided in the model inputs section of this report.

The report will analyse all living spaces (as per CIBSE TM59). The areas that are at high risk of overheating will be analysed in this report. These dwellings have the following characteristics:

- Large glazing areas
 - Topmost floor
 - South orientation
 - Single aspect
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Criteria for Defining Overheating

According to the CIBSE TM59: 2017 – Design methodology for the assessment of overheating risk in homes, to reduce the risk of overheating the space must comply with the following criteria:

- a. For living rooms, kitchen, and bedrooms: 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 per cent of occupied hours (Same as Criterion 1 of TM52).
- b. For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26 °C for more than 1% of the annual hours (1% of the annual hours between 22:00 and 07:00)

According to the Approved Document O, the requirements to reduce the risk of overheating are below:

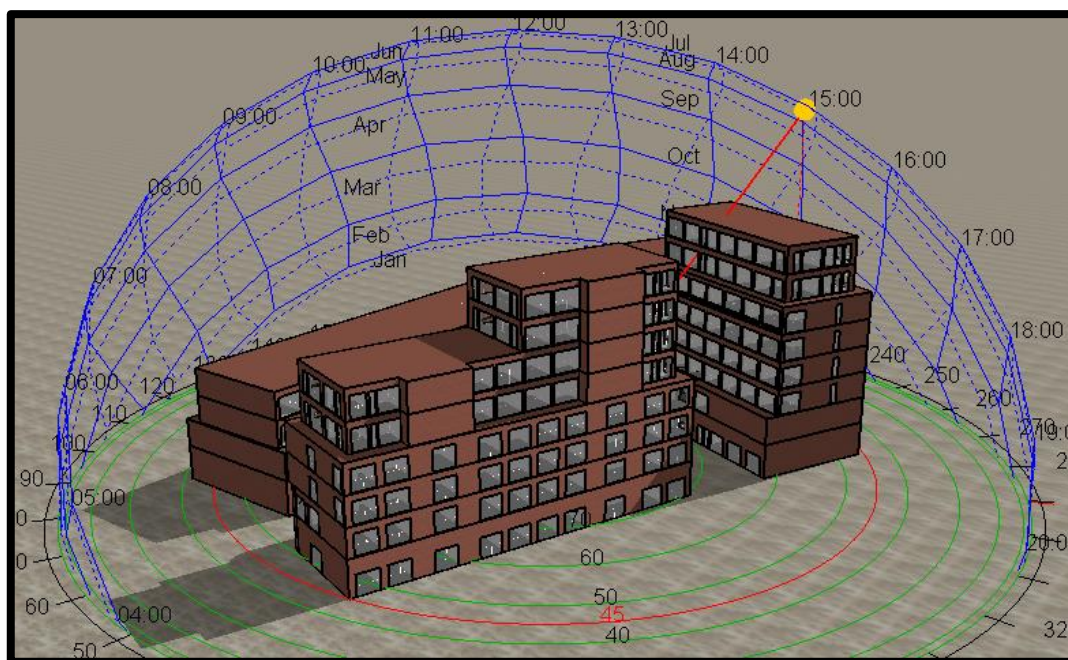
1. Reasonable provision must be made in respect of a dwelling, institution or any other building containing one or more rooms for residential purposes, other than a room in a hotel ("residences") to—
 - (a) limit unwanted solar gains in summer;
 - (b) provide an adequate means to remove heat from the indoor environment.
 2. In meeting the obligations in paragraph—
 - (a) account must be taken of the safety of any occupant, and their reasonable enjoyment of the residence; and
 - (b) mechanical cooling may only be used where insufficient heat is capable of being removed from the indoor environment without it.
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Simulation Software

An overheating analysis has been undertaken using Dynamic Simulation Modelling, Design Builder 7.0.0.102 has been employed for this. Design Builder is a DCLG approved simulation environment that complies with the requirements of CIBSE Guide A. A screenshot of the model is shown below.



Weather Files

The simulation has been conducted on the building with an orientation at 325 degrees, using London Gatwick Design Summer Years (DSY), as provided by CIBSE. The simulation to be used for compliance is DSY1 2020 High 50, London, in accordance with TM59 requirements.

Building Fabric U-Values

Element	Proposed U-value (W.m ⁻² .K ⁻¹) L1A
External walls	0.18
Ground floors	0.15
Roof	0.11
Windows	1.3 (G-Value 0.5, 0.4 & 0.3)
Air Permeability	3 @ 50Pa(m ³ /h-m ²)

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Internal Gains

Gain Source	Living / Kitchen
Lighting	2 W.m ⁻²
Equipment	450W (18:00-20:00) 200W (20:00-22:00) 110W (09:00-18:00 & 22:00-00:00) 35W Base load for rest of the day.
Occupancy	2 People at 75% gains from 9am-10pm, room is unoccupied for the rest of the day.
Occupancy Sensible/Latent	75/55 W/person
Gain Source	Double Bedrooms
Lighting	2 W.m ⁻²
Equipment	80 W (08:00-23:00) 10W (23:00-08:00)
Occupancy	2 people at 70% gains from 11pm to 8am 2 people at full gains from 8am to 9am and from 10pm to 11pm 1 person at full gains in the bedroom from 9am to 10pm
Occupancy Sensible/Latent	75/55 W/person

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Cooling Hierarchy

Major development proposals should reduce potential overheating and reliance on air conditioning systems and demonstrate this in accordance with the following cooling hierarchy:

1. Minimise internal heat generation through energy efficient design;
2. Reduce the amount of heat entering a building in summer through shading, albedo, fenestration, insulation and green roofs and walls;
3. Manage the heat within the building through exposed internal thermal mass and high ceilings;
4. Passive ventilation;
5. Mechanical ventilation;
6. Active cooling systems (ensuring they are the lowest carbon options).

Cooling Strategy

No mechanical cooling will be applied.

Windows

Glazing will be a crucial aspect to ensure thermal comfort of the occupied spaces. Windows were modelled with a g-value of 0.5, 0.4 & 0.3, variations are outlined in the appendix.

Shading

Fixed external shading from architectural layouts has been modelled.

Natural Ventilation Rates

All openable windows have been modelled with a 50% openable area and all balcony doors were modelled as fully openable.

In alignment with Approved Document Part O, all windows will be modelled as starting to open at an internal temperature of 22°C, fully open at 26°C, then starting to close when the internal temperature falls below 26°C and closed when below 22°C.

At night, (11pm to 8am), openings should be modelled as fully open if both of the following apply.

- i. The opening is on the first floor or above and not easily accessible.
- ii. The internal temperature exceeds 23°C at 11pm.

When a ground floor or easily accessible room is unoccupied, both of the following apply.

- i. In the day, the windows, patio doors and balcony doors should be modelled as open, if this can be done securely.
- ii. At night, windows, patio doors and balcony doors should be modelled as closed.

An entrance door should be included, which should be shut all the time.

Mechanical Ventilation Rates

Mechanical ventilation is designed as continuous MEV system, with boosted extract rates of 8l/s for bathrooms and 13l/s for kitchens.

4ach & 5ach of mechanical purge ventilation will also be required. Variation of areas is outlined in the appendix.

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Overview of Results

According to the CIBSE TM52 – The limits of thermal comfort: avoiding overheating in European buildings (2013) and CIBSE Guide A – Environmental Design (2015), to reduce the risk of overheating the space must comply with at least two of the following three criteria:

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

The tables below show the results of compliance to TM59.

In order to comply with TM59 assessment of overheating risk in homes,

Criterion A – Same as criterion 1 for TM52.

Criterion B - For bedrooms only: The operative temperature in bedrooms from 10 pm to 7 am shall not exceed 26°C for more than 1% of the hours (3% for mechanically ventilated homes).

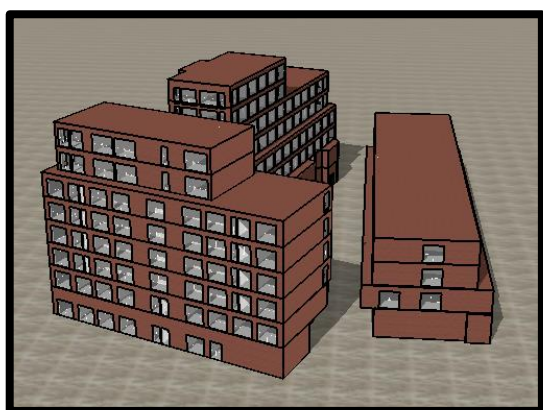


Figure 1 North West Elevation Block A

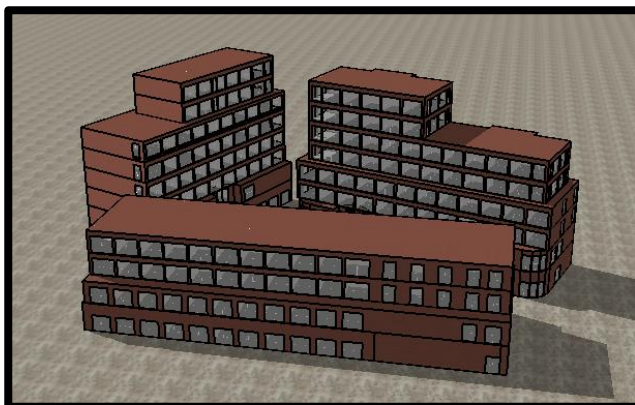


Figure 2 North East Elevation Block A



Figure 3 South West Elevation Block A

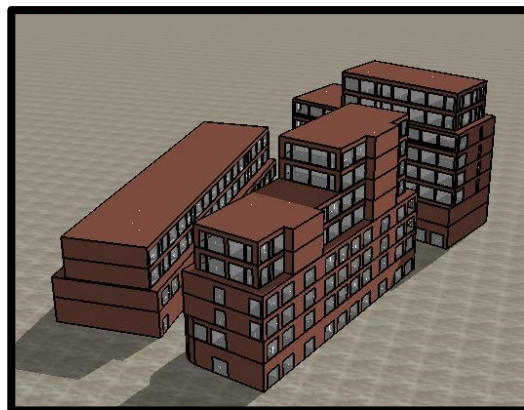


Figure 4 South East Elevation Block A

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TM59 Simulation Results

In order to assess the overheating within the building with 2020 weather data, all floors were modelled, to reflect general issues which may arise. Detailed below are the results from the simulated model. The below shows the data using the 2020 Weather file, and details as outlined in the conclusion.

Block A CIBSE TM59 dataset:

Block	Zone	Criterion A (%)	Criterion B (hr)	Pass/Fail
01XFirstFloorA	WH04XBed1	0.14	5	Pass
01XFirstFloorA	WH04XBed2	0	4.5	Pass
01XFirstFloorA	WH05XBed1	1.19	21.5	Pass
01XFirstFloorA	WH05XBed2	1.93	22.5	Pass
01XFirstFloorA	WH05XBed3	1.03	16.5	Pass
01XFirstFloorA	WH06XBed1	2.11	21	Pass
01XFirstFloorA	WH06XBed2	2.06	26.5	Pass
01XFirstFloorA	WH06XBed3	2.88	21.5	Pass
01XFirstFloorA	WH06XBed4	2.91	20	Pass
01XFirstFloorA	WH06XBed5	2.06	21	Pass
01XFirstFloorA	WH06XBed6	2.03	20	Pass
01XFirstFloorA	WH06XBed7	2.27	23	Pass
01XFirstFloorA	WH06XBed8	2.24	31.5	Pass
01XFirstFloorA	WH06XBed9	1.27	22.5	Pass
02XSecondFloorA	01XBedroom1	2.17	25	Pass
02XSecondFloorA	01XBedroom2	1.31	26.5	Pass
02XSecondFloorA	01XBedroom3	0.88	28.5	Pass
02XSecondFloorA	01XLiving	2.84	N/A	Pass
02XSecondFloorA	02XBedroom	2.7	23.5	Pass
02XSecondFloorA	02XLiving	1.63	N/A	Pass
02XSecondFloorA	03XBedroom	2.49	25.5	Pass
02XSecondFloorA	03XLiving	1.55	N/A	Pass
02XSecondFloorA	04XBedroom1	1.86	28.5	Pass
02XSecondFloorA	04XBedroom2	0.82	25	Pass
02XSecondFloorA	04XBedroom3	0.8	25.5	Pass
02XSecondFloorA	04XLiving	0.9	N/A	Pass
02XSecondFloorA	05XBedroom1	1.41	22	Pass
02XSecondFloorA	05XBedroom2	0.63	22.5	Pass
02XSecondFloorA	05XLiving	0.96	N/A	Pass
02XSecondFloorA	06XBedroom	2.52	25	Pass
02XSecondFloorA	06XLiving	0.28	N/A	Pass
02XSecondFloorA	07XBedroom1	0.48	15	Pass
02XSecondFloorA	07XBedroom2	0.36	14.5	Pass
02XSecondFloorA	07XBedroom3	0.27	10.5	Pass

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02XSecondFloorA	07XLiving	0	N/A	Pass
02XSecondFloorA	08XBedroom1	0.11	8	Pass
02XSecondFloorA	08XBedroom2	0.28	14	Pass
02XSecondFloorA	08XLiving	0.26	N/A	Pass
03XThirdFloorA	01XBedroom1	2.68	24.5	Pass
03XThirdFloorA	01XBedroom2	1.34	23.5	Pass
03XThirdFloorA	01XLiving	2.41	N/A	Pass
03XThirdFloorA	02XBedroom	2.5	24	Pass
03XThirdFloorA	02XLiving	1.81	N/A	Pass
03XThirdFloorA	03XBedroom	2.33	24	Pass
03XThirdFloorA	03XLiving	1.7	N/A	Pass
03XThirdFloorA	04XBedroom1	2.27	19	Pass
03XThirdFloorA	04XBedroom2	1.17	18.5	Pass
03XThirdFloorA	04XLiving	1.42	N/A	Pass
03XThirdFloorA	05XBedroom	1.02	16.5	Pass
03XThirdFloorA	05XLiving	1.68	N/A	Pass
03XThirdFloorA	06XBedroom	2.31	20.5	Pass
03XThirdFloorA	06XLiving	0.39	N/A	Pass
03XThirdFloorA	07XBedroom1	0.96	13.5	Pass
03XThirdFloorA	07XBedroom2	0.81	13.5	Pass
03XThirdFloorA	07XBedroom3	0.56	10	Pass
03XThirdFloorA	07XLiving	0.26	N/A	Pass
03XThirdFloorA	08XBedroom1	0.22	6.5	Pass
03XThirdFloorA	08XLiving	0.34	N/A	Pass

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Block B CIBSE TM59 dataset:

Block	Zone	Criterion A (%)	Criterion B (hr)	Pass/Fail
00XGroundFloorB	WH07	0.13	N/A	Pass
00XGroundFloorB	WH07XBed1	1.31	12.5	Pass
00XGroundFloorB	WH07XBed2	2.08	12.5	Pass
00XGroundFloorB	WH08	0	N/A	Pass
00XGroundFloorB	WH08XBed1	2.24	13.5	Pass
00XGroundFloorB	WH08XBed2	2.17	13	Pass
00XGroundFloorB	WH08XBed3	2.06	12	Pass
00XGroundFloorB	WH08XBed4	1.96	9	Pass
01XFirstFloorB	WH07	0.08	N/A	Pass
01XFirstFloorB	WH07XBed1	0.96	17	Pass
01XFirstFloorB	WH07XBed2	0.89	15.5	Pass
01XFirstFloorB	WH07XBed3	1.33	22.5	Pass
01XFirstFloorB	WH07XBed4	1.44	26.5	Pass
01XFirstFloorB	WH07XBed5	0	3.5	Pass
01XFirstFloorB	WH08	0	N/A	Pass
01XFirstFloorB	WH08XBed1	0	3	Pass
01XFirstFloorB	WH08XBed2	1.65	29.5	Pass
01XFirstFloorB	WH08XBed3	1.45	27	Pass
01XFirstFloorB	WH08XBed4	1.12	21.5	Pass
01XFirstFloorB	WH08XBed5	1.24	21.5	Pass
02XSecondFloorB	01XBedroom1	0.43	5	Pass
02XSecondFloorB	01XBedroom2	1.33	24	Pass
02XSecondFloorB	01XBedroom3	1.3	22.5	Pass
02XSecondFloorB	01XLiving	0.26	N/A	Pass
02XSecondFloorB	02XBedroom1	0.2	3.5	Pass
02XSecondFloorB	02XBedroom2	0.1	14.5	Pass
02XSecondFloorB	02XBedroom3	0.15	20	Pass
02XSecondFloorB	02XLiving	0.31	N/A	Pass
02XSecondFloorB	03XBedroom	0.34	5.5	Pass
02XSecondFloorB	03XLiving	0.36	N/A	Pass
02XSecondFloorB	04XBedroom1	0.13	15	Pass
02XSecondFloorB	04XBedroom2	0.04	13	Pass
02XSecondFloorB	04XBedroom3	0.11	3	Pass
02XSecondFloorB	04XLiving	0.18	N/A	Pass
02XSecondFloorB	05XBedroom1	1.29	24.5	Pass
02XSecondFloorB	05XBedroom2	1.38	24.5	Pass
02XSecondFloorB	05XBedroom3	0.32	3.5	Pass
02XSecondFloorB	05XLiving	0.1	N/A	Pass

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03XThrdFloorB	01XBedroom1	1.62	29	Pass
03XThrdFloorB	01XBedroom2	1.55	21.5	Pass
03XThrdFloorB	01XLiving	0.49	N/A	Pass
03XThrdFloorB	02XBedroom	0.17	13	Pass
03XThrdFloorB	02XLiving	0.39	N/A	Pass
03XThrdFloorB	03XBedroom	0.53	10	Pass
03XThrdFloorB	03XLiving	0.52	N/A	Pass
03XThrdFloorB	04XBedroom	0.13	11	Pass
03XThrdFloorB	04XLiving	0.34	N/A	Pass
03XThrdFloorB	05XBedroom1	1.44	20	Pass
03XThrdFloorB	05XBedroom2	1.47	28	Pass
03XThrdFloorB	05XLiving	0.44	N/A	Pass
04XFourthFloorB	01XBedroom1	0.76	7.5	Pass
04XFourthFloorB	01XBedroom2	1.45	26.5	Pass
04XFourthFloorB	01XBedroom3	1.43	26	Pass
04XFourthFloorB	01XLiving	0.36	N/A	Pass
04XFourthFloorB	02XBedroom1	0.25	6	Pass
04XFourthFloorB	02XBedroom2	0.11	15.5	Pass
04XFourthFloorB	02XBedroom3	0.17	18	Pass
04XFourthFloorB	02XLiving	0.36	N/A	Pass
04XFourthFloorB	03XBedroom	0.46	8.5	Pass
04XFourthFloorB	03XLiving	0.46	N/A	Pass
04XFourthFloorB	04XBedroom1	0.13	14	Pass
04XFourthFloorB	04XBedroom2	0.08	15	Pass
04XFourthFloorB	04XBedroom3	0.18	3.5	Pass
04XFourthFloorB	04XLiving	0.28	N/A	Pass
04XFourthFloorB	05XBedroom1	1.38	25.5	Pass
04XFourthFloorB	05XBedroom2	1.48	26.5	Pass
04XFourthFloorB	05XBedroom3	0.43	6	Pass
04XFourthFloorB	05XLiving	0.26	N/A	Pass
05XFiftrthFloorB	01XBedroom1	2.5	21.5	Pass
05XFiftrthFloorB	01XBedroom2	2.08	26	Pass
05XFiftrthFloorB	01XLiving	1.29	N/A	Pass
05XFiftrthFloorB	02XBedroom	0.24	18	Pass
05XFiftrthFloorB	02XLiving	0.52	N/A	Pass
05XFiftrthFloorB	03XBedroom	0.82	10.5	Pass
05XFiftrthFloorB	03XLiving	0.72	N/A	Pass
05XFiftrthFloorB	04XBedroom	0.25	21	Pass
05XFiftrthFloorB	04XLiving	0.44	N/A	Pass
05XFiftrthFloorB	05XBedroom1	1.9	27	Pass

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05XFiftrthFloorB	05XBedroom2	2.06	26.5	Pass
05XFiftrthFloorB	05XLiving	0.77	N/A	Pass
06XSixthFloorB	01XBedroom1	1.36	18	Pass
06XSixthFloorB	01XBedroom2	0.77	23	Pass
06XSixthFloorB	01XLiving	1.19	N/A	Pass
06XSixthFloorB	02XBedroom1	0.52	10.5	Pass
06XSixthFloorB	02XBedroom2	2.38	22.5	Pass
06XSixthFloorB	02XLiving	0.54	N/A	Pass
06XSixthFloorB	03XBedroom	2.57	22	Pass
06XSixthFloorB	03XLiving	1.68	N/A	Pass
07XSeventhFloorB	01XBedroom1	2.04	15	Pass
07XSeventhFloorB	01XBedroom2	1.48	20.5	Pass
07XSeventhFloorB	01XLiving	1.88	N/A	Pass
07XSeventhFloorB	02XBedroom1	1.15	9.5	Pass
07XSeventhFloorB	02XBedroom2	2.66	25.5	Pass
07XSeventhFloorB	02XLiving	1.06	N/A	Pass
07XSeventhFloorB	03XBedroom	2.12	24	Pass
07XSeventhFloorB	03XLiving	2.68	N/A	Pass

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Block C CIBSE TM59 dataset:

Block	Zone	Criterion A (%)	Criterion B (hr)	Pass/Fail
00XGroundFloorC	WH01	0.8	N/A	Pass
00XGroundFloorC	WH01XBed1	0.1	0	Pass
00XGroundFloorC	WH01XBed2	0.08	0	Pass
00XGroundFloorC	WH02	0.36	N/A	Pass
00XGroundFloorC	WH02XBed1	0.08	0	Pass
00XGroundFloorC	WH02XBed2	0.07	0	Pass
00XGroundFloorC	WH02XBed3	0.07	0	Pass
00XGroundFloorC	WH02XBed4	0.07	0	Pass
00XGroundFloorC	WH03	0.75	N/A	Pass
00XGroundFloorC	WH03XBed1	0.1	0	Pass
00XGroundFloorC	WH03XBed2	0.11	0	Pass
01XFirstFloorC	WH01	1.03	N/A	Pass
01XFirstFloorC	WH01XBed1	0	0	Pass
01XFirstFloorC	WH01XBed2	0.1	0	Pass
01XFirstFloorC	WH01XBed3	0.06	0	Pass
01XFirstFloorC	WH02	0.05	N/A	Pass
01XFirstFloorC	WH02XBed1	0	0	Pass
01XFirstFloorC	WH02XBed2	0.01	0	Pass
01XFirstFloorC	WH02XBed3	0	0	Pass
01XFirstFloorC	WH02XBed4	0	0	Pass
01XFirstFloorC	WH02XBed5	0	0	Pass
01XFirstFloorC	WH02XBed6	0	0	Pass
01XFirstFloorC	WH03	0.77	N/A	Pass
01XFirstFloorC	WH03XBed1	0	0	Pass
01XFirstFloorC	WH03XBed2	0.06	0	Pass
01XFirstFloorC	WH03XBed3	0.08	0	Pass
02XSecondFloorC	01XBedroom1	0.6	0	Pass
02XSecondFloorC	01XBedroom2	0.1	0	Pass
02XSecondFloorC	01XLiving	2.48	N/A	Pass
02XSecondFloorC	02XBedroom	0.28	0	Pass
02XSecondFloorC	02XLiving	1.11	N/A	Pass
02XSecondFloorC	03XBedroom	0.25	0	Pass
02XSecondFloorC	03XLiving	0.39	N/A	Pass
02XSecondFloorC	04XBedroom1	0.06	0	Pass
02XSecondFloorC	04XBedroom2	0.06	0	Pass
02XSecondFloorC	04XLiving	0.41	N/A	Pass
02XSecondFloorC	05XBedroom1	0.06	0	Pass
02XSecondFloorC	05XBedroom2	0.06	0	Pass

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02XSecondFloorC	05XLiving	0.36	N/A	Pass
02XSecondFloorC	06XBedroom	0.21	0	Pass
02XSecondFloorC	06XLiving	0.39	N/A	Pass
02XSecondFloorC	07XBedroom	0.28	0	Pass
02XSecondFloorC	07XLiving	0.7	N/A	Pass
02XSecondFloorC	08XBedroom1	0.1	0	Pass
02XSecondFloorC	08XBedroom2	0.15	0	Pass
02XSecondFloorC	08XLiving	1.52	N/A	Pass
03XThirdFloorC	01XBedroom1	0.87	0.5	Pass
03XThirdFloorC	01XBedroom2	0.13	0.5	Pass
03XThirdFloorC	01XLiving	2.74	N/A	Pass
03XThirdFloorC	02XBedroom	0.5	0	Pass
03XThirdFloorC	02XLiving	0.44	N/A	Pass
03XThirdFloorC	03XBedroom1	0.06	0	Pass
03XThirdFloorC	03XBedroom2	0.06	0	Pass
03XThirdFloorC	03XLiving	0.93	N/A	Pass
03XThirdFloorC	04XBedroom1	0.04	0	Pass
03XThirdFloorC	04XBedroom2	0.08	0	Pass
03XThirdFloorC	04XLiving	0.93	N/A	Pass
03XThirdFloorC	05XBedroom	0.45	0	Pass
03XThirdFloorC	05XLiving	0.13	3.5	Pass
03XThirdFloorC	06XBedroom1	0.1	0	Pass
03XThirdFloorC	06XBedroom2	0.17	0	Pass
03XThirdFloorC	06XLiving	1.55	N/A	Pass
04XFourthFloorC	01XBedroom1	1.34	0.5	Pass
04XFourthFloorC	01XBedroom2	0.18	0.5	Pass
04XFourthFloorC	01XLiving	2.95	N/A	Pass
04XFourthFloorC	02XBedroom	0.78	0	Pass
04XFourthFloorC	02XLiving	2.67	N/A	Pass
04XFourthFloorC	03XBedroom	0.71	0	Pass
04XFourthFloorC	03XLiving	1.47	N/A	Pass
04XFourthFloorC	04XBedroom1	0.11	0	Pass
04XFourthFloorC	04XBedroom2	0.11	0	Pass
04XFourthFloorC	04XLiving	1.63	N/A	Pass
04XFourthFloorC	05XBedroom1	0.1	0	Pass
04XFourthFloorC	05XBedroom2	0.13	0	Pass
04XFourthFloorC	05XLiving	1.81	N/A	Pass
04XFourthFloorC	06XBedroom	0.82	0	Pass
04XFourthFloorC	06XLiving	1.7	N/A	Pass
04XFourthFloorC	07XBedroom	0.88	0.5	Pass

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04XFourthFloorC	07XLiving	2.89	N/A	Pass
04XFourthFloorC	08XBedroom1	0.15	0	Pass
04XFourthFloorC	08XBedroom2	0.34	0	Pass
04XFourthFloorC	08XLiving	2.08	N/A	Pass
05XFifthFloorC	01XBedroom	1.54	0.5	Pass
05XFifthFloorC	01XLiving	2.27	N/A	Pass
05XFifthFloorC	02XBedroom	0.52	0	Pass
05XFifthFloorC	02XLiving	1.21	N/A	Pass
05XFifthFloorC	03XBedroom1	0.67	0.5	Pass
05XFifthFloorC	03XBedroom2	0.29	0.5	Pass
05XFifthFloorC	03XLiving	1.03	N/A	Pass
05XFifthFloorC	04XBedroom1	1.06	0	Pass
05XFifthFloorC	04XBedroom2	0.34	0	Pass
05XFifthFloorC	04XLiving	2.04	N/A	Pass
05XFifthFloorC	05XBedroom	1.51	0	Pass
05XFifthFloorC	05XLiving	2.81	N/A	Pass
05XFifthFloorC	06XBedroom	0.71	0	Pass
05XFifthFloorC	06XLiving	2.63	N/A	Pass
06XSixthFloorC	01XBedroom	1.82	1	Pass
06XSixthFloorC	01XLiving	2.59	N/A	Pass
06XSixthFloorC	02XBedroom	0.67	0	Pass
06XSixthFloorC	02XLiving	1.78	N/A	Pass
06XSixthFloorC	03XBedroom1	0.6	0.5	Pass
06XSixthFloorC	03XBedroom2	0.21	0	Pass
06XSixthFloorC	03XLiving	2.54	N/A	Pass
07XSeventhFloor	01XBedroom	2.39	0.5	Pass
07XSeventhFloor	01XLiving	2.89	N/A	Pass
07XSeventhFloor	02XBedroom	1.55	0	Pass
07XSeventhFloor	02XLiving	2.61	N/A	Pass
07XSeventhFloor	03XBedroom1	1.41	0	Pass
07XSeventhFloor	03XBedroom2	0.5	0	Pass
07XSeventhFloor	03XLiving	2.74	N/A	Pass

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Conclusions

The analysis has responded to CIBSE TM59 & Approved Document O requirements relating to overheating.

The report has set out how the occupied spaces perform against strict thermal comfort standards for overheating.

The results indicate the building shows no risk of overheating based on the parameters outlined.

The results include a variation of 0.5, 0.4 & 0.3 g-values, and 4ach & 5ach of mechanical supply which is outlined below in the appendix.

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Appendix



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Overheating Assessment and Analysis

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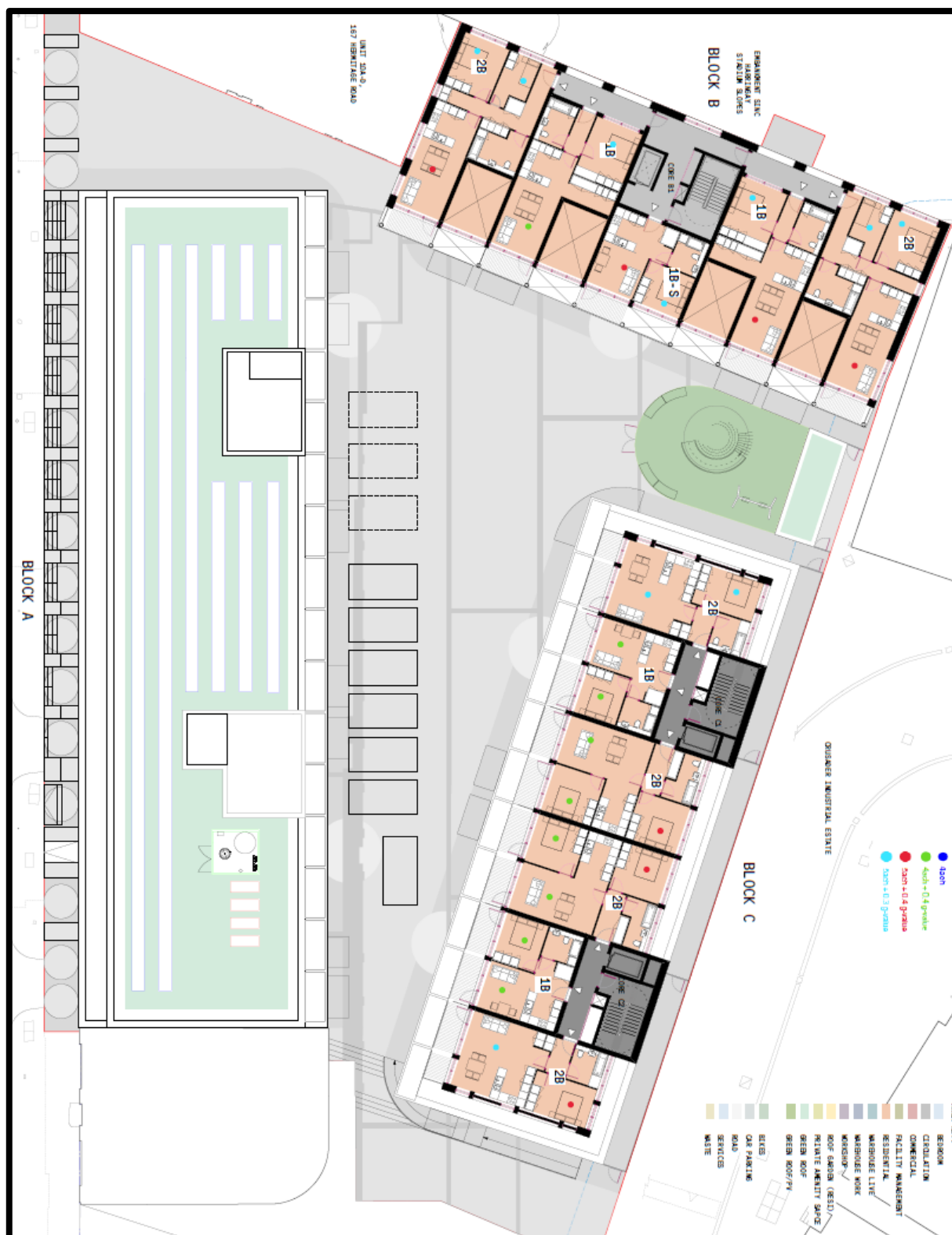
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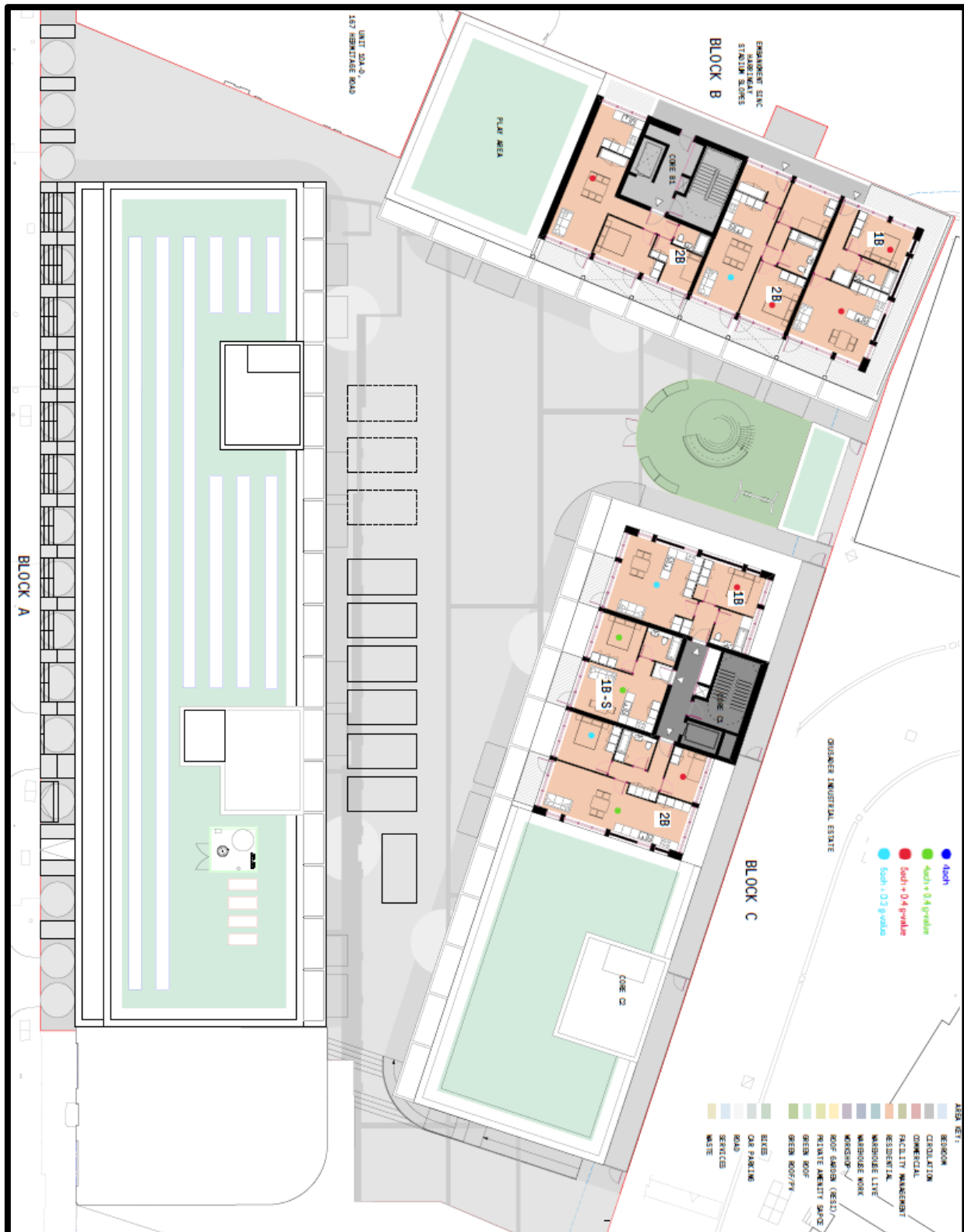


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