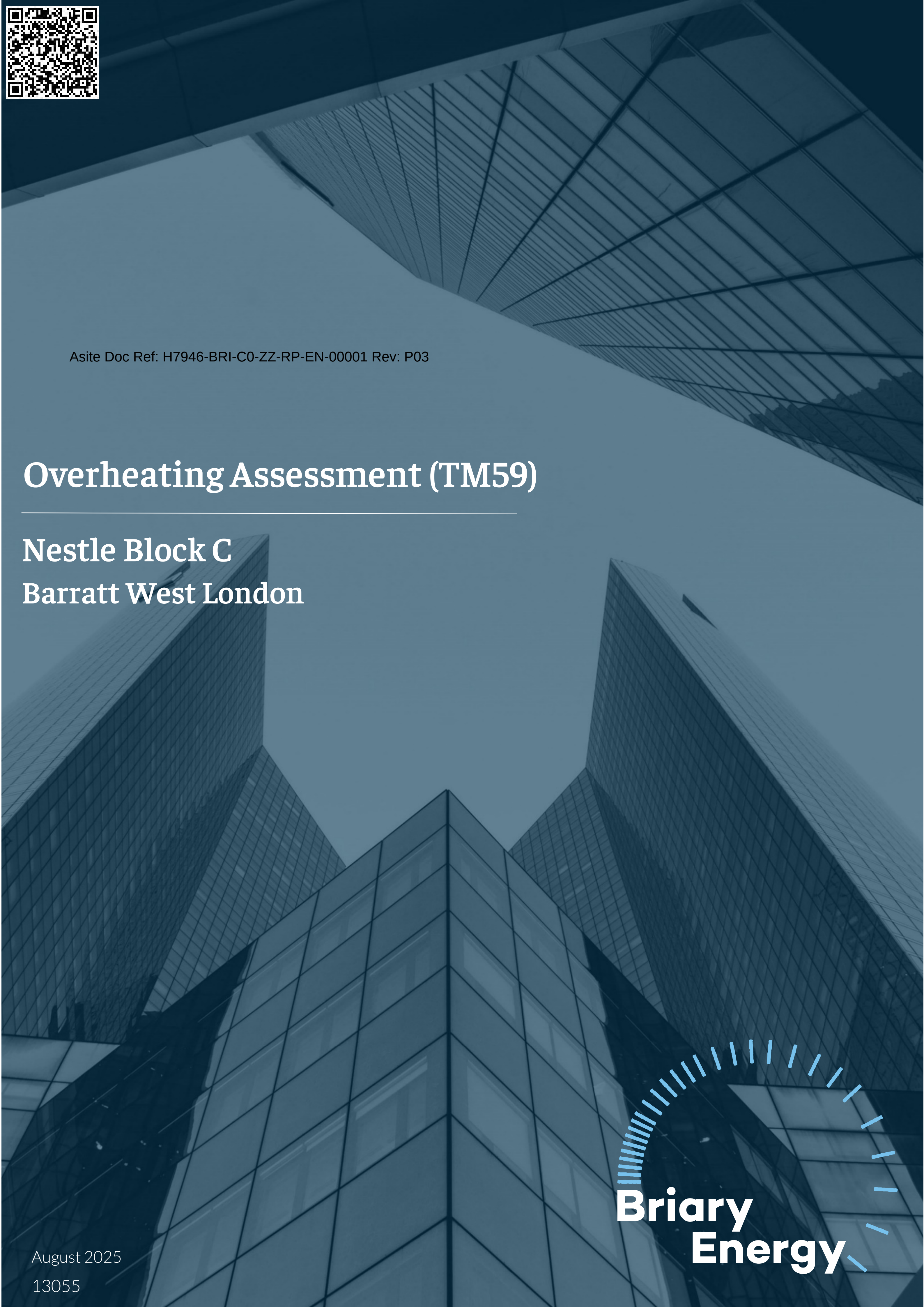

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Overheating Assessment (TM59)

Nestle Block C
Barratt West London

Briary Energy

August 2025

13055

Table of Contents

Revisions

Revision	Revision details	Page Nos	Document prepared by			Document checked by		
			Name	Signature	Date	Name	Signature	Date
Rev01	New document	All	G.Thomas	[signature]	08/12/23	C.Nicholls	[signature]	08/12/23
Rev02	Amended floor plans	All	G.Thomas	[signature]	18/06/25	C.Nicholls	[signature]	18/06/25
Rev03	Amended fabric spec	All	G.Thomas	[signature]	05/08/25	C.Nicholls	[signature]	05/08/25

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Project Ref: 13055

Scope and Exclusions

Briary Energy Limited has been commissioned by Barratt West London to carry out an overheating analysis of Nestle Block C, to provide design stage guidance and maximise occupant comfort levels. Consequently, thermal modelling has been undertaken to demonstrate compliance with CIBSE TM59 requirements.

All results and strategies are directly affected by the inputs listed in this document; any deviation from these is bound to output different results.

It is important to note that with any modelling exercise there are assumptions and approximations that have to be made. Details of assumptions made and approximations used are supplied as part of the report.

All results are based on the output from computer modelling software which is based on climatic conditions and patterns of use bound not to be identical to the real-life situation. Therefore, these results should be read as those following the overheating mitigation risk calculation methodology, but not as guaranteed real-life observations.

When determining the free area available for ventilation during sleeping hours, only the proportion of openings that can be opened securely should be considered to provide useful ventilation. This particularly applies in the following locations, where openings may be vulnerable to intrusion by a casual or opportunistic burglar.
a. Ground floor bedrooms.
b. Easily accessible bedrooms.

All of the following limits on CIBSE's TM59, section 3.3, apply.
a. When a room is occupied during the day (8am to 11pm), openings should be modelled to do all of the following.
 i. Start to open when the internal temperature exceeds 22°C.
 ii. Be fully open when the internal temperature exceeds 26°C.
 iii. Start to close when the internal temperature falls below 26°C.
 iv. Be fully closed when the internal temperature falls below 22°C.
b. 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.
c. When a ground floor or easily accessible room is unoccupied, both of the following apply.
 i. In the day, 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.
d. An entrance door should be included, which should be shut all the time.

Solar gains in summer should be limited by any of the following means.
a. Fixed shading devices, comprising any of the following.
 i. Shutters, ii. External blinds, iii. Overhangs, iv. Awnings.
b. Glazing design, involving any of the following solutions.
 i. Size, ii. Orientation, iii. g-value, iv. Depth of the window reveal.
c. Building design – for example, the placement of balconies.
d. Shading provided by adjacent permanent buildings, structures or landscaping.

Although internal blinds and curtains provide some reduction in solar gains, they should not be taken into account when considering whether requirement O1 has been met.

Foliage, such as tree cover, can provide some reduction in solar gains. However, it should not be taken into account when considering whether requirement O1 has been met.

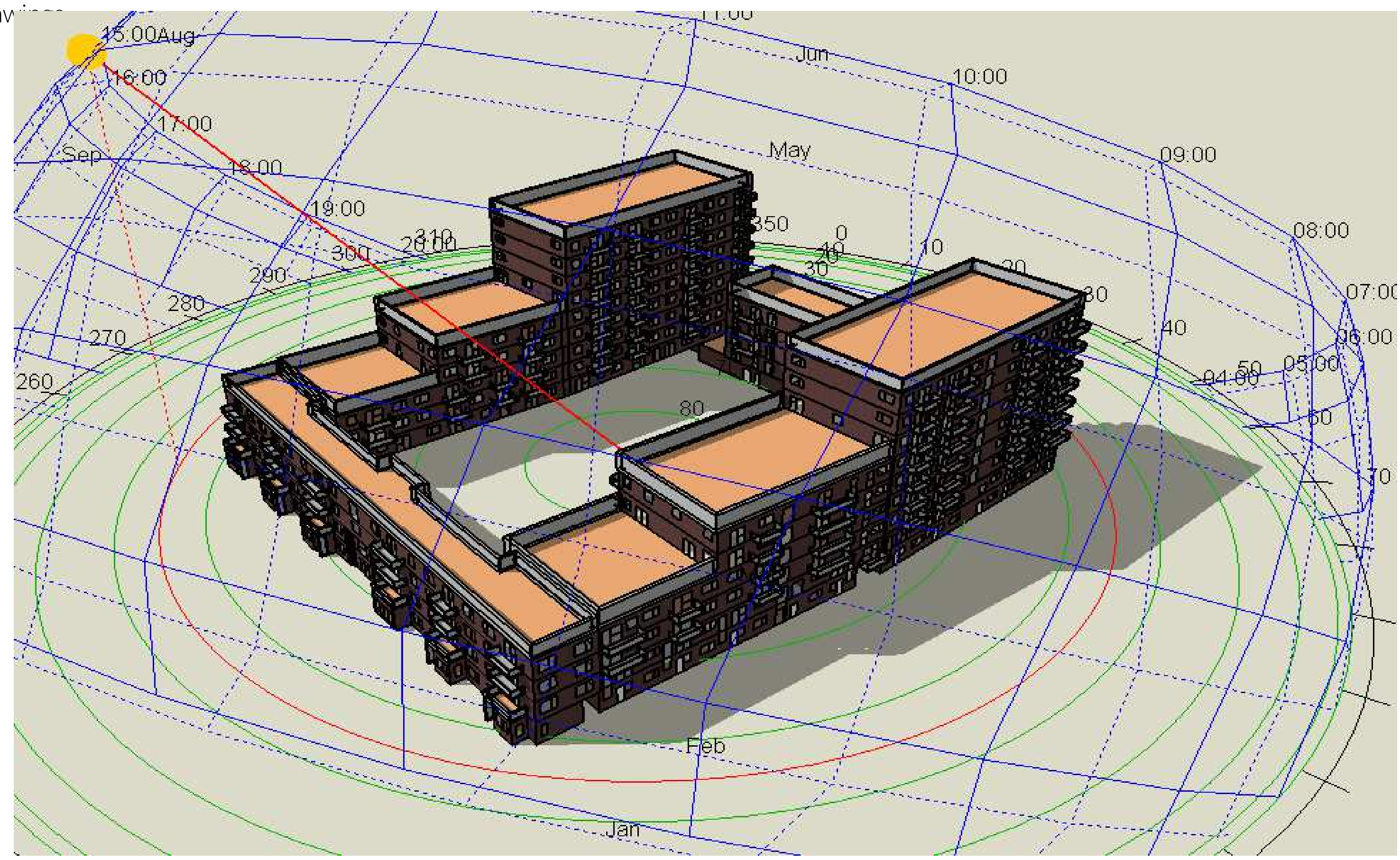
DSM Model

The building has been modelled using DesignBuilder Dynamic Simulation Modelling Software, using the internationally approved EnergyPlus Simulation Engine.

The DSM model can be used to provide:

- Overheating analysis (this report)
- Energy consumption prediction
- Heating and Cooling Load prediction
- Thermal Fluid Dynamics Assessment
- Building Compliance Assessment (Building Regulations Part-L and EPC)

The model geometry was based on the architectural drawings and the windows were modelled in accordance to the elevation drawings.



Design Builder Model

Classification of Overheating

Methodology

The methodology used within this report has been to establish the thermal comfort levels in the occupied spaces through using dynamic simulation modelling and respond with suitable passive design measures to mitigate solar gains, provide adequate ventilation and increase thermal mass. National regulations have set high standards and numerous iterations have been undertaken to determine suitable fabric improvements. All assumptions in the modelling are provided in the model inputs section of this report.

The climate change scenario has been included in this report. External temperatures are likely to increase because of climate change. The consequences of increased summer peak temperatures and further measures may need to be implemented to mitigate overheating risk.
CIBSE TM52 (2013) Cat. II thermal comfort category has been used in this assessment.

Criteria for defining overheating - Natural Ventilation

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

Criterion 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).

Criterion 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, equivalent to 32 hours).

Mechanical Ventilation

TM59 also provides the following guidance for spaces that are predominantly mechanically ventilated;

For homes with restricted window openings, the CIBSE 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 annual hours.

Bedroom Security Issues

For any housetypes where there are bedrooms on the ground floor, or easily accessible windows, the following applies:
In the day, the bedroom windows, patio doors or balcony doors should be modelled as open, if this can be done securely.
At night, the ground floor bedroom windows, patio doors and balcony doors should be modelled as closed.

Sample Selection

The assessment should try to identify all the dwellings that are at risk of overheating. These are likely to be those (a) with large glazing areas, (b) on the topmost floor, (c) having less shading, (d) having large, sun-facing windows, (e) having a single aspect, or (f) having limited opening windows.
Sample selection justification is listed within the results section.

Acoustic Requirements

A Noise Report supplied by RBA Acoustics offers guidance on the extent to which openable windows may be utilised for ventilation as a component of the TM59 overheating mitigation strategy.

The illustration below demonstrates the façades that will not utilise windows during the night-time hours of 23:00 - 07:00 for ventilation to alleviate overheating, within bedroom areas. Within the following assessment these windows have been modelled as closed at night and an alternative mitigation strategy proposed as required.

Levels 0-3

Levels 4-5

Levels 6-8

Design Criteria and Model Input

The following information has been used to produce the building model:

Drawings

Plans	H7946-CTA-C0-00-DR-AD-20100-H7946-CTA-C0-10-DR-AD-20110

Building Services

HVAC	MVHR capable of providing 82 l/s flow rate. Hybrid cooling utilised on flats where MVHR not shown to overcome overheating, as per ventilation schedule provided
Infiltration Rate	Approx. 2m³/h/m² @50pa
Lighting	Part L compliant scheme
Heating	ASHP Based Community Heating

Construction Properties

Fabric Element	U-Value
External Walls	0.17 W/m².K
Floors	0.11-0.14 W/m2.K
Roof	0.08 W/m².K

Thermal Mass Construction Type	Area Applied	Thermal Mass
External Wall (Concrete columns, SFS with plasterboard lining)	All	Lightweight
Internal walls (plasterboard partitions)	All	Lightweight
Internal ceiling (plasterboard)	All	Lightweight

Window properties	U-Value - 1.10 W/m².K
	G-Value - 0.38

Free Area has been calculated assuming a coefficient of discharge (Cd) of 0.62. Each openings free area is individually calculated. No blinds specified.

Simulation Software

An overheating analysis has been undertaken using Dynamic Simulation Modelling, Design Builder, v7.1.3.015 has been employed for this. Design Builder is a Department for Communities and Local Government approved simulation environment that complies with the requirements of CIBSE Guide A.

DesignBuilder SOFTWARE

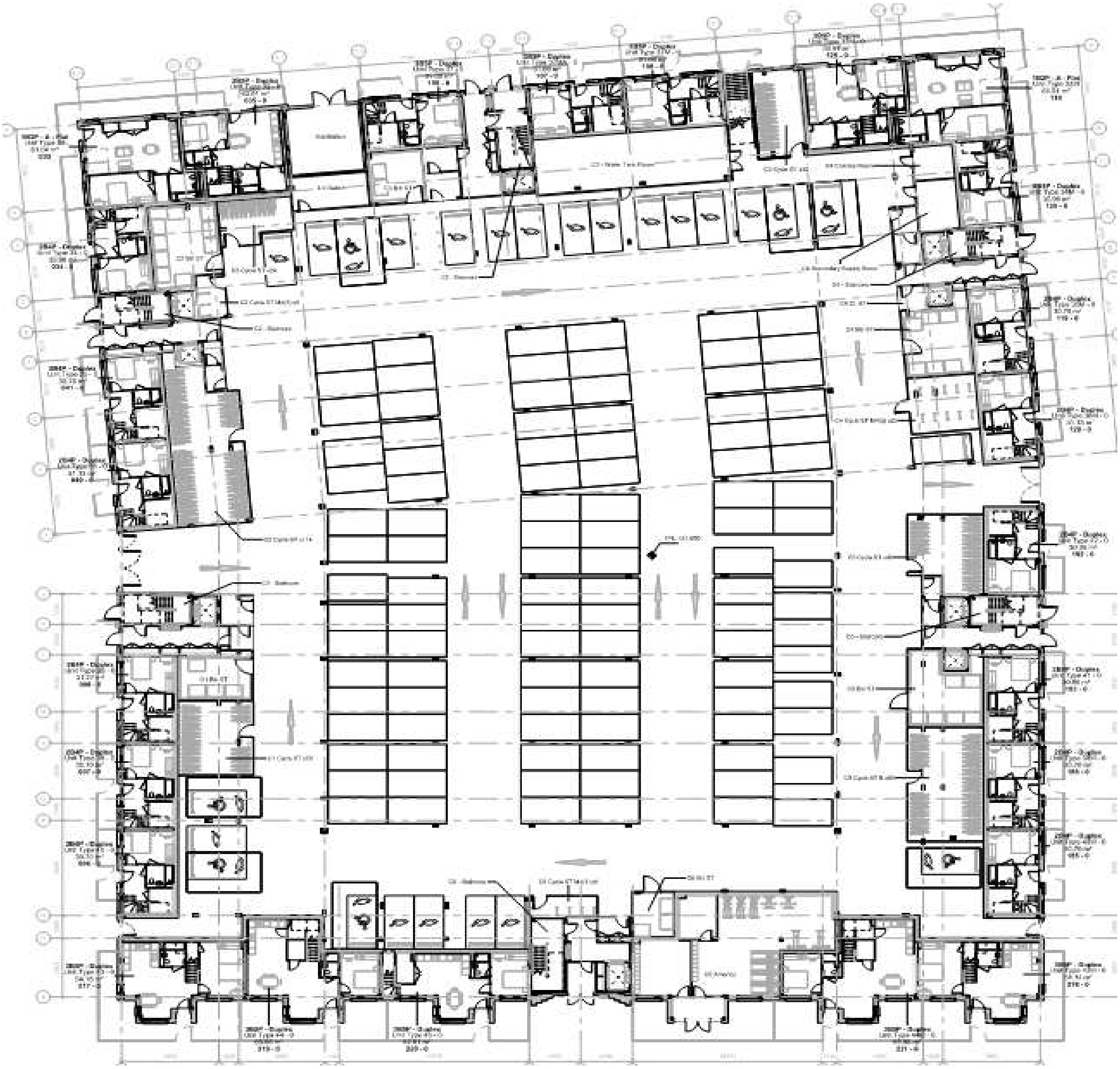
Weather File

The CIBSE Design Summer Year (DSY1), London Heathrow, for the 2020s, high emissions, 50% percentile scenario, has been used for the purposes of this report.

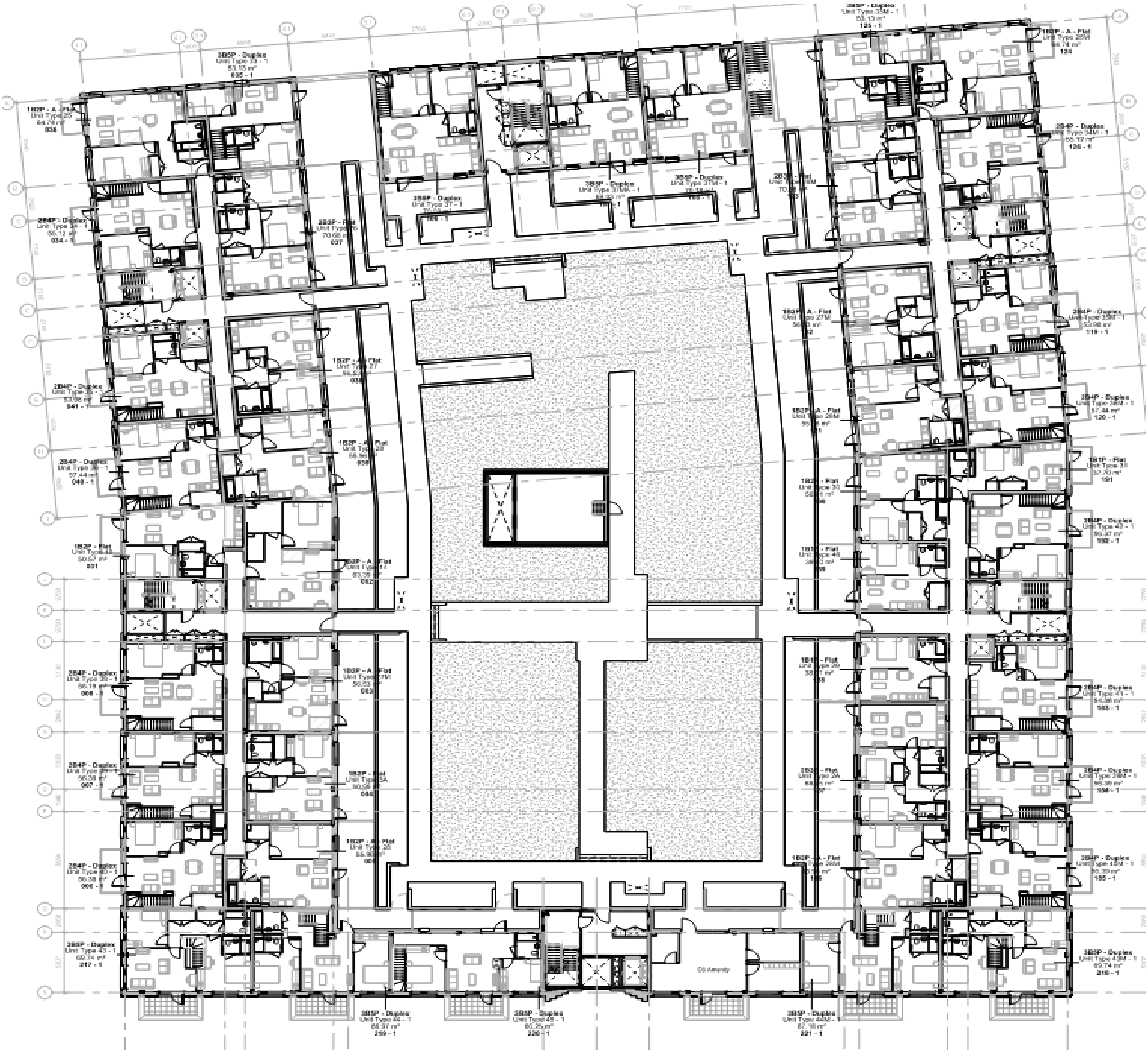
Adjacent Buildings

Details of any adjacent buildings have not been used in the model. This is the optimum method for overheating analysis, as no reliance has been made on shading from adjacent structures to prevent overheating.

Drawings



Drawings



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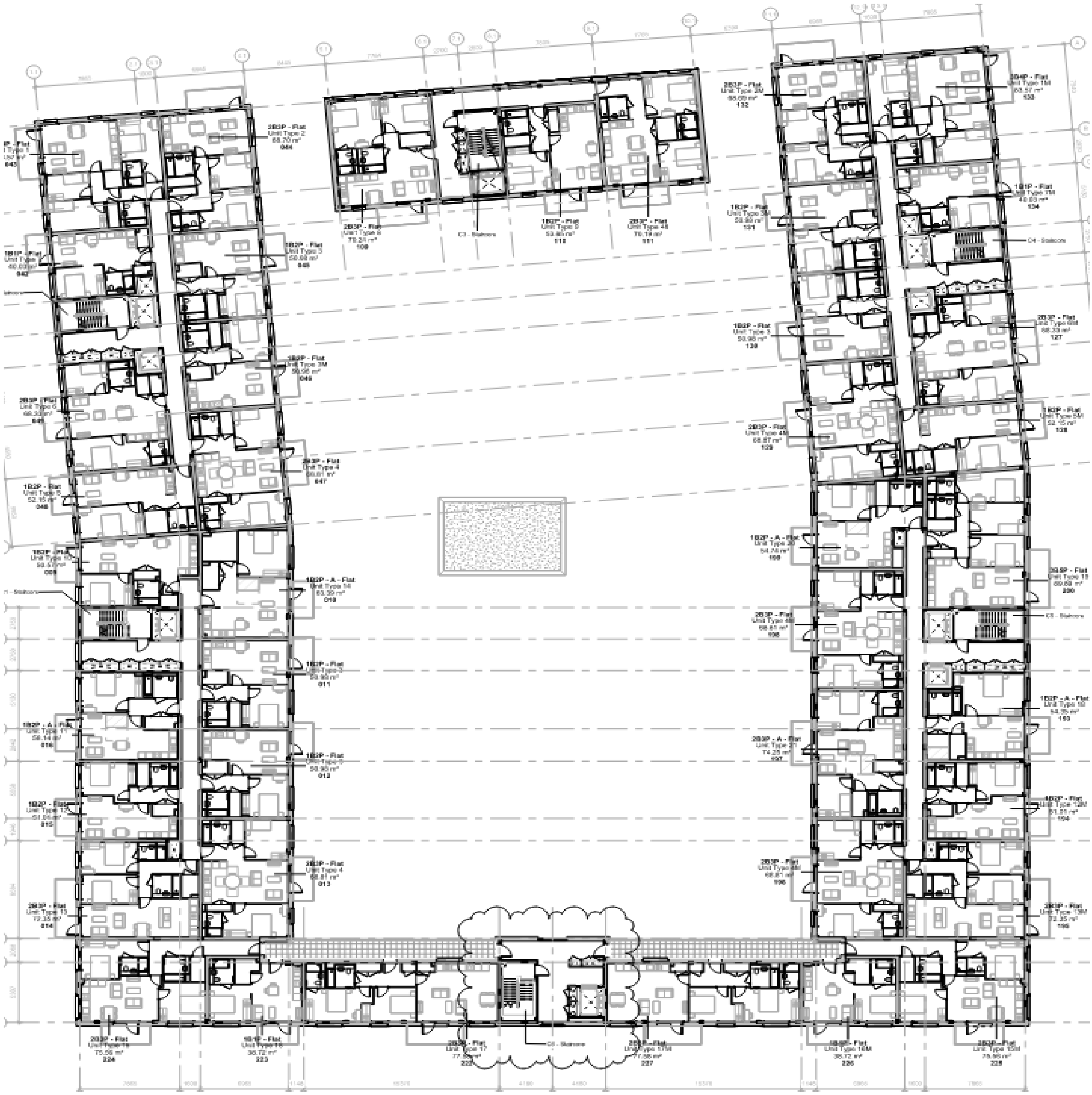

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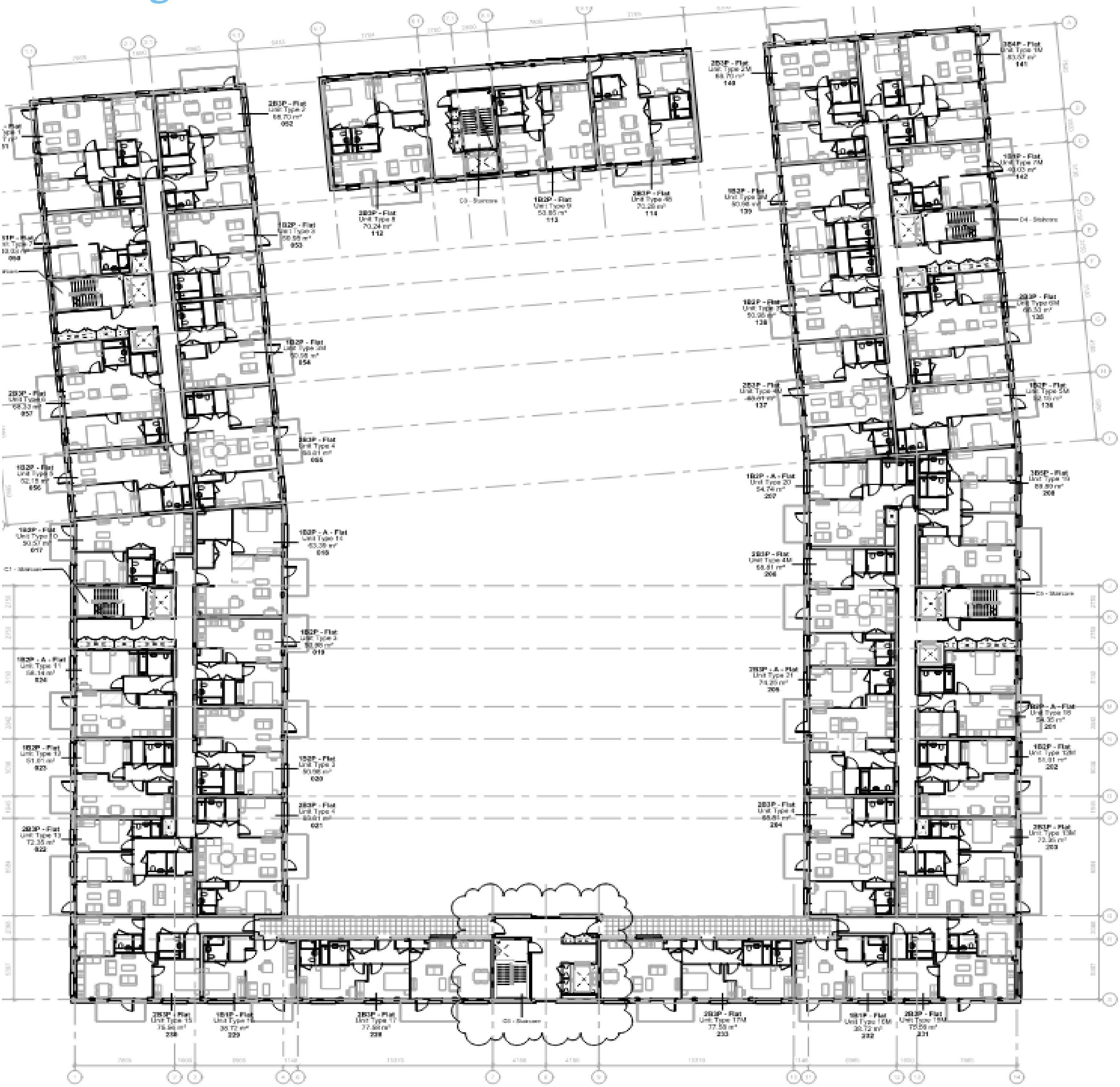
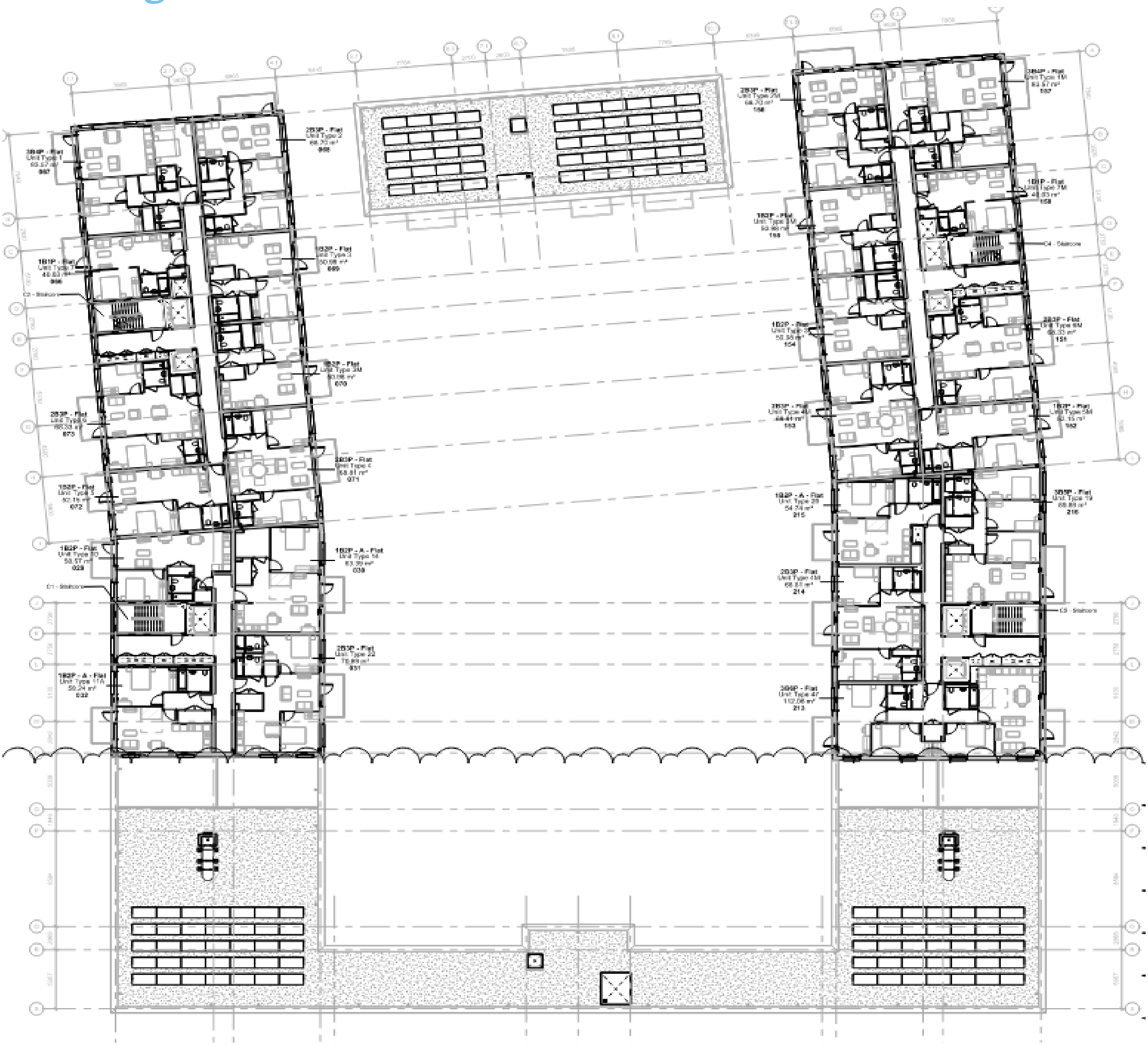


Drawings

Drawings



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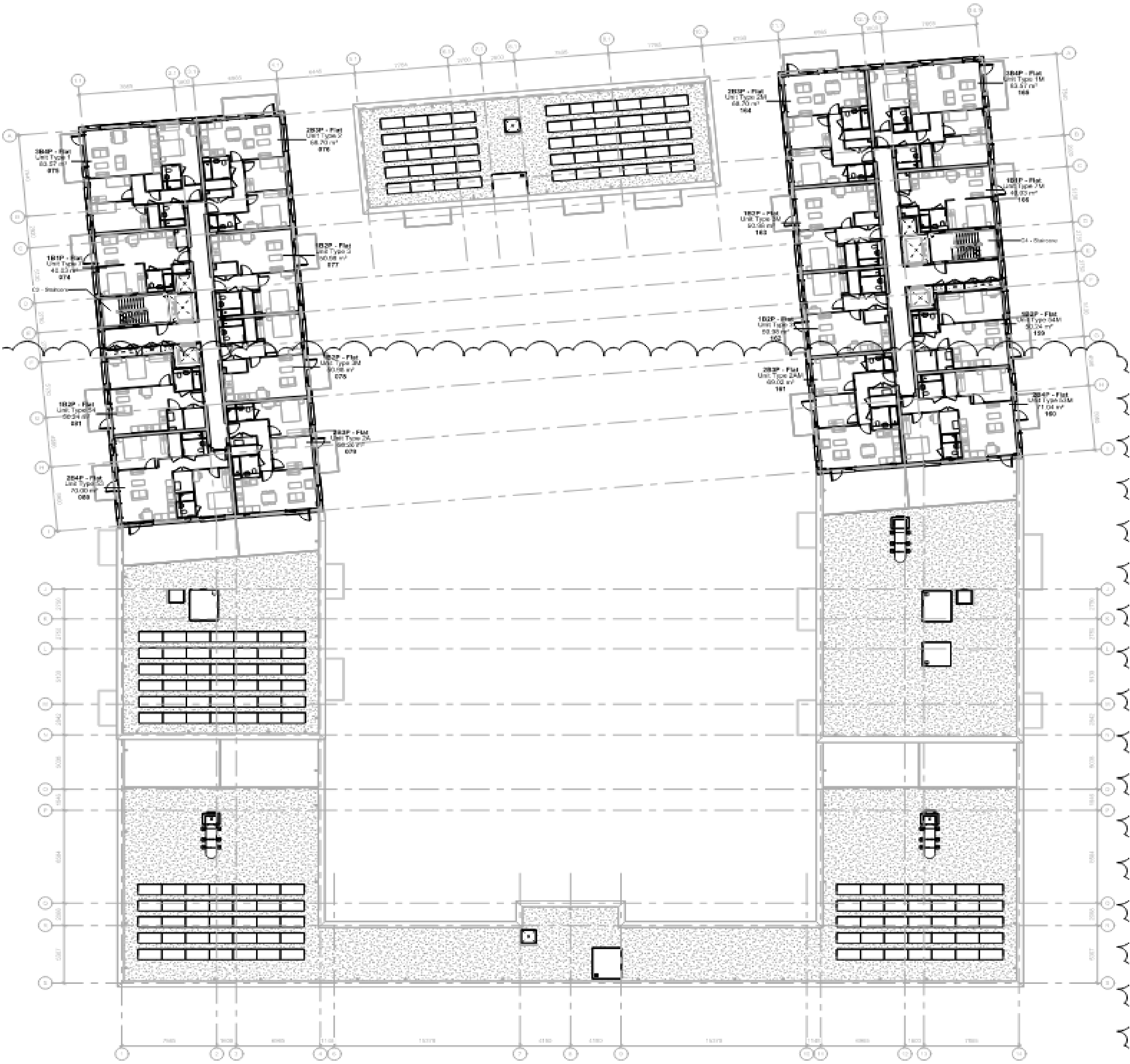

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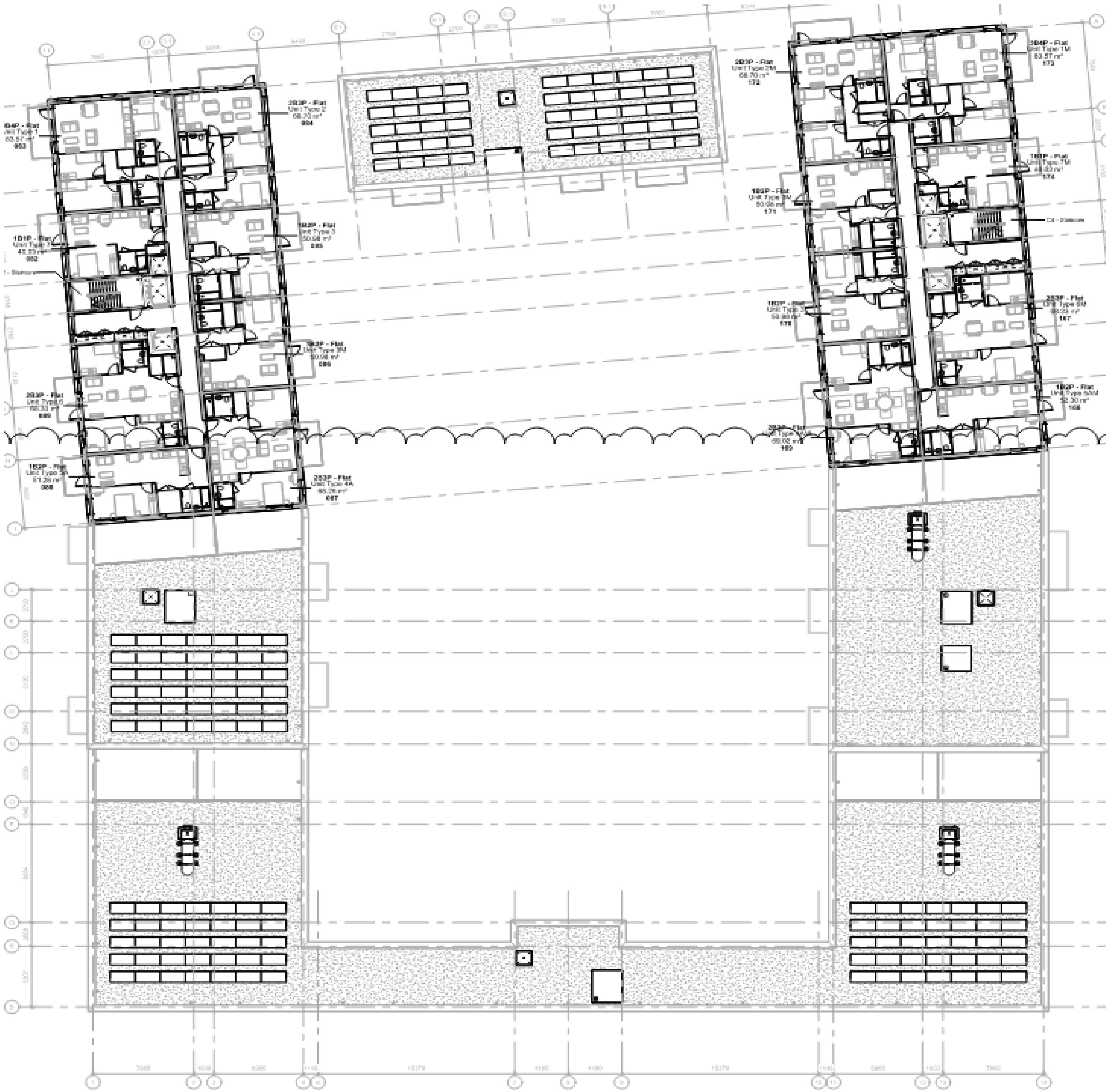

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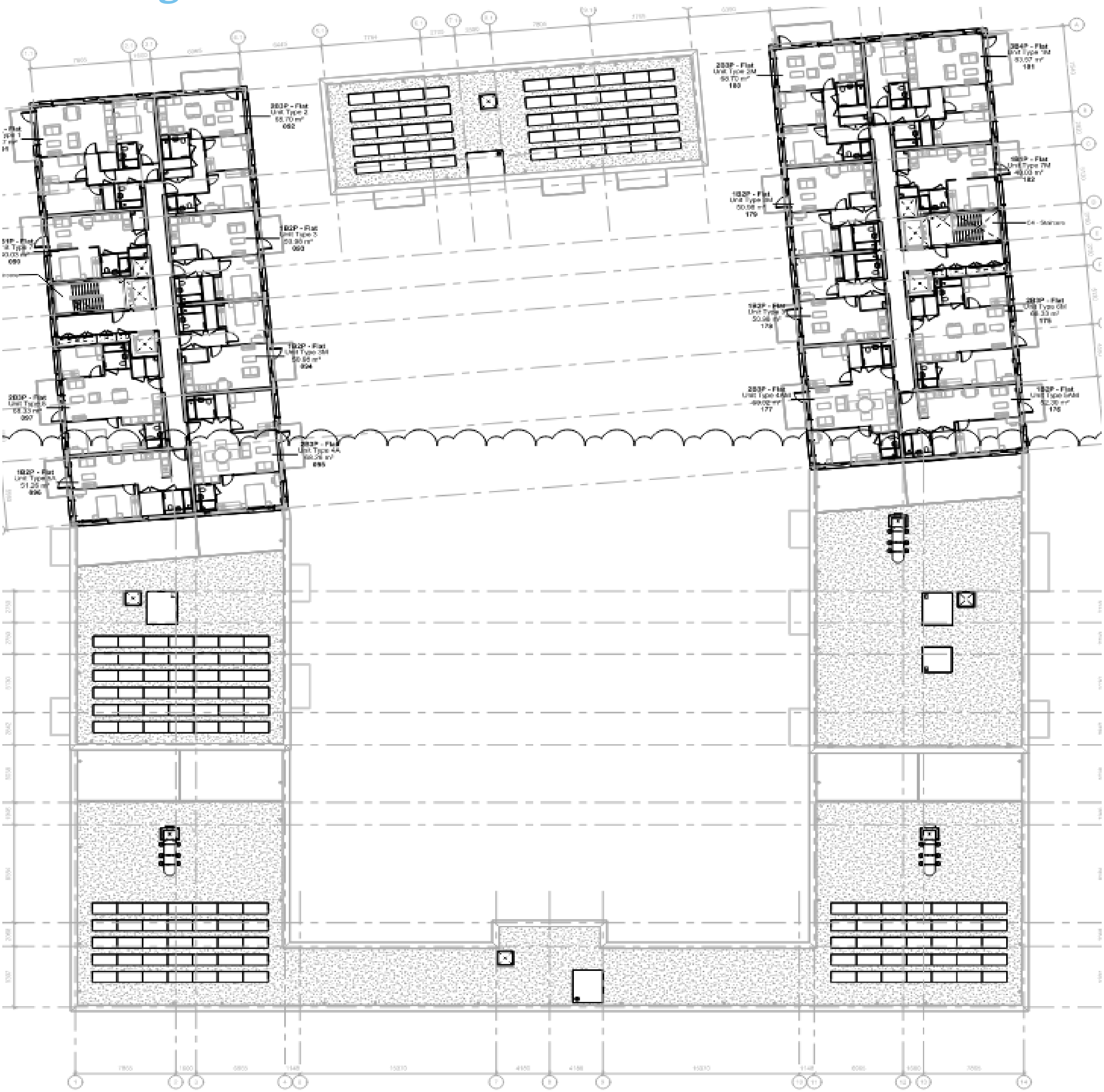

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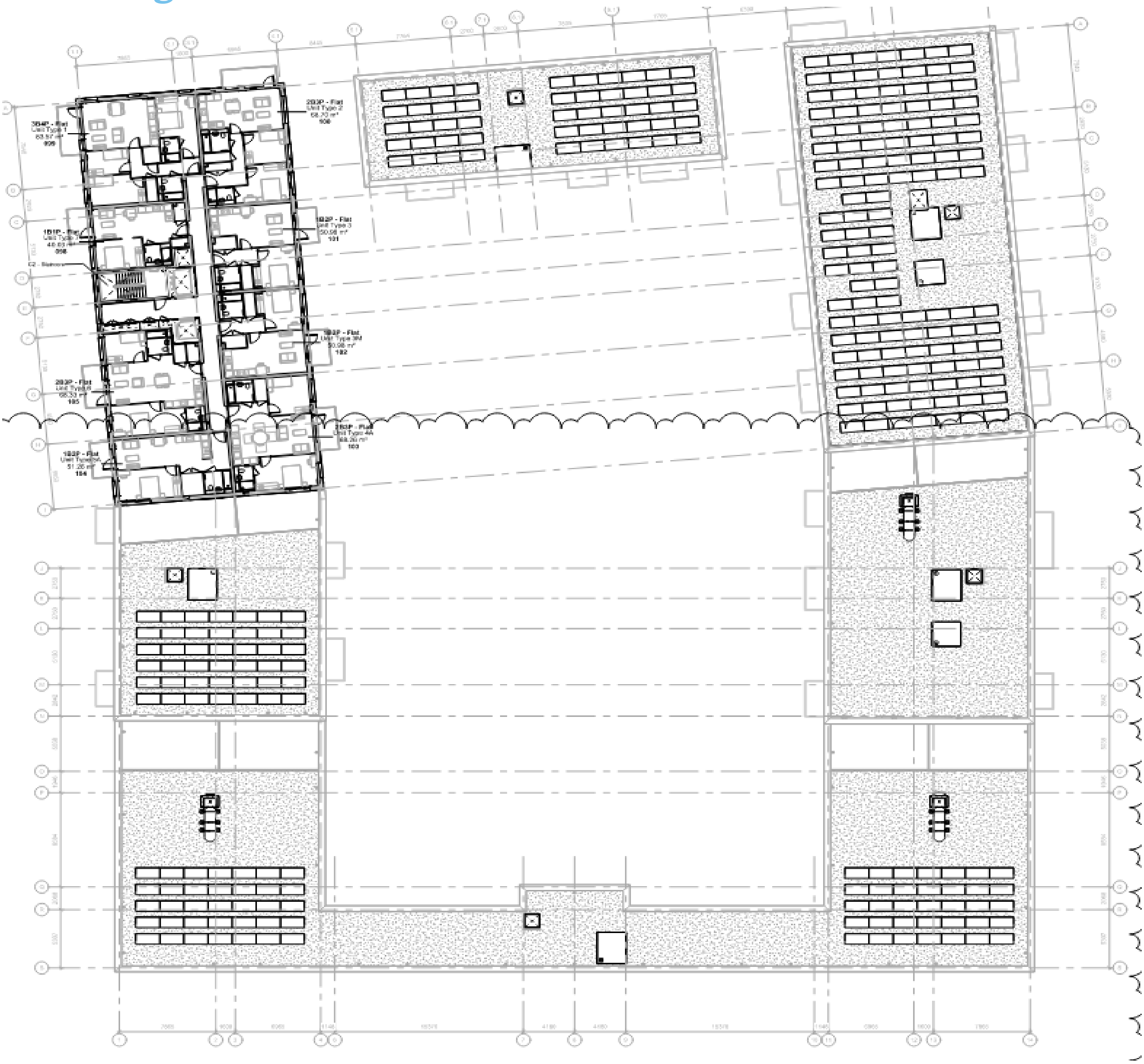

Internal Conditions

Defined by dynamic simulation model as per TM59:2017, Section 6, Table 2:

Table 2 - Occupancy and equipment gain descriptions

Unit/ room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm, 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only; see section 3.1 above

Guidance and Performance Targets

Approved Document O (2021)

Approved Document O sets out building regulation requirements for mitigating overheating within new build dwellings, in which it states the following;

Requirement O1 is met by designing and constructing the building to achieve both of the following.
a. Limiting unwanted solar gains in summer.
b. Providing an adequate means of removing excess heat from the indoor environment.
NOTE: The guidance and regulations are written for the purposes of protecting health and welfare. Following this guidance does not guarantee the comfort of building occupants.

In the Secretary of State's view, compliance with requirement O1 can be demonstrated by using one of the following methods.
a. The simplified method for limiting solar gains and providing a means of removing excess heat.
b. The dynamic thermal modelling method.
It is proposed to assess the development as per the dynamic thermal modelling. In which ADO states compliance is achieved through the following;

To demonstrate compliance using the dynamic thermal modelling method, all of the following guidance should be followed.
a. CIBSE's TM59 methodology for predicting overheating risk.
b. The limits on the use of CIBSE's TM59 methodology.
c. The acceptable strategies for reducing overheating risk.
The building control body should be provided with a report that demonstrates that the residential building passes CIBSE's TM59 assessment of overheating. This report contains the details in CIBSE's TM59, section 2.3.

London Plan (2021)

'Policy SI 4 Managing heat risk' of The London Plan provides design guidance in regards to overheating within dwellings;

A. Development proposals should minimise adverse impacts on the urban heat island through design, layout, orientation, materials and the incorporation of green infrastructure.

B. Major development proposals should demonstrate through an energy strategy how they will reduce the potential for internal overheating and reliance on air conditioning systems in accordance with the following cooling hierarchy:

1) reduce the amount of heat entering a building through orientation, shading, high albedo materials, fenestration, insulation and the provision of green infrastructure
2) minimise internal heat generation through energy efficient design
3) manage the heat within the building through exposed internal thermal mass and high ceilings
4) provide passive ventilation
5) provide mechanical ventilation
6) provide active cooling systems

Results - Predominantly Naturally Ventilated Homes

Block and Level	Zone	Criterion A %	Criterion B hr	Pass/Fail
C1L00	Bedroom 1 Type 38	0.57	8.75	Pass
C1L00	Bedroom Type 39	0.54	14	Pass
C1L01	Bedroom Type 14	1.27	31.5	Pass
C1L01	KLD Type 15	1.58	N/A	Pass
C1L01	Bedroom Type 27M	1.82	22	Pass
C1L01	KLD Type 27M	1.80	N/A	Pass
C1L01	Bedroom 2 Type 40	0.73	25.75	Pass
C1L01	KLD Type 14	0.33	N/A	Pass
C1L01	Bedroom 2 Type 38	0.88	25.25	Pass
C1L01	KLD Type 38 1	1.01	N/A	Pass
C1L03	Bedroom 1 Type 4	0.12	1.5	Pass
C1L03	Bedroom 2 Type 4	0.02	1.5	Pass
C1L03	Bedroom 1 Type 13	0.11	1.5	Pass
C1L03	Bedroom 2 Type 13	0.12	1.25	Pass
C1L03	Bedroom Type 12	0.09	1.75	Pass
C1L03	Bedroom Type 10	0.38	31.75	Pass
C1L03	Bedroom Type 5	0.40	22.75	Pass
C1L03	Bedroom Type 3	0.41	28.75	Pass
C1L03	KLD Type 3	0.68	N/A	Pass
C1L03	KLD Type 4	0.95	N/A	Pass
C1L03	KLD Type 13	1.16	N/A	Pass
C1L03	KLD Type 12	0.54	N/A	Pass
C1L04	Bedroom Type 14	0.68	1	Pass
C1L04	KLD Type14	0.70	N/A	Pass
C1L04	Bedroom Type 11A	0.13	30.5	Pass
C1L04	KLD Type 11A	0.00	N/A	Pass
C1L05	Bedroom 1	0.96	27.25	Pass
C1L05	Bedroom 2	0.77	27.75	Pass
C1L05	KLD 1	1.26	N/A	Pass
C1L05	Bedroom	0.75	29.25	Pass
C1L05	KLD	0.88	N/A	Pass

Results - Predominantly Naturally Ventilated Homes

Block and Level	Zone	Criterion A %	Criterion B hr	Pass/Fail
C2L00	Bedroom 1 Type 35	0.66	8	Pass
C2L01	Bedroom Type 27	2.10	28	Pass
C2L01	KLD Type 27	2.98	N/A	Pass
C2L01	Bedroom 2 Type 36	0.49	23.75	Pass
C2L01	KLD Type 36 1	1.82	N/A	Pass
C2L05	Bedoom 3 Type 1	0.00	1	Pass
C2L05	Bedroom 1 Type 1	0.18	2	Pass
C2L05	Bedroom 2 Type 1	0.35	1.5	Pass
C2L05	KLD Type 3M	0.57	N/A	Pass
C2L05	KLD Type 1	1.04	N/A	Pass
C2L05	Bedroom 1 Type 2	2.77	27.25	Pass
C2L05	Bedroom 2 Type 2	1.60	24.5	Pass
C2L05	KLD Type 2	0.72	N/A	Pass
C2L05	Bedroom Type 3M	1.57	31	Pass
C2L05	Bedroom Type 5	1.47	32	Pass
C2L05	KLD Type 5	0.08	N/A	Pass
C2L09	Bedroom 1	0.36	9	Pass
C2L09	Bedroom 2	0.14	1.75	Pass
C2L09	Bedroom 3	0.00	1	Pass
C2L09	Bedroom 1 Type 4A	0.98	31.5	Pass
C2L09	Bedroom 2 Type 4A	1.06	29.5	Pass
C2L09	KLD	1.47	N/A	Pass
C2L09	KLD Type 4A	2.16	N/A	Pass
C3L00	Bedroom 1 Type 37	1.32	5.5	Pass
C3L01	Bedroom 2 Type 37	1.35	25.75	Pass
C3L01	Bedroom 3 Type 37	2.11	19	Pass
C3L01	KLD Type 37 MA	2.65	N/A	Pass
C3L04	Bedroom 1 Type 8	2.85	1.5	Pass
C3L04	Bedroom 2 Type 8	1.89	23.75	Pass
C3L04	KLD Type 8	2.18	N/A	Pass
C3L04	Bedroom Type 9	2.56	22	Pass

Results - Predominantly Naturally Ventilated Homes

Block and Level	Zone	Criterion A %	Criterion B hr	Pass/Fail
C3L04	KLD Type 9	2.20	N/A	Pass
C4L00	Bedroom Type 36M	0.59	10.25	Pass
C4L01	Bedroom 2 Type 36M	0.13	1	Pass
C4L01	Bedroom 2 Type 35M	0.27	29.75	Pass
C4L01	KLD 35M 1	0.54	N/A	Pass
C4L01	Bedroom Type 27M	0.08	26.25	Pass
C4L01	KLD Type 27M	2.14	N/A	Pass
C4L01	Bedroom 1 Type 26M	2.46	24.25	Pass
C4L01	Bedroom 2 Type 26M	0.00	22.25	Pass
C4L01	KLD Type 26M	0.46	N/A	Pass
C4L01	Bedroom 3	0.24	24.75	Pass
C4L05	Bedroom 1 Type 6M	0.88	1	Pass
C4L05	Bedroom 2 Type 6M	0.06	1.5	Pass
C4L05	Bedroom 1 Type 1M	1.02	2.25	Pass
C4L05	Bedroom 2 Type 1M	0.11	1.5	Pass
C4L05	Bedroom 3 Type 1M	0.21	1.75	Pass
C4L05	KLD Type 6M	0.05	N/A	Pass
C4L05	Bedroom Type 3	0.28	27.75	Pass
C4L05	KLD Type 3	0.12	N/A	Pass
C4L05	Bedroom 1 Type 3M	0.33	27.75	Pass
C4L05	KLD Type 3M	1.01	N/A	Pass
C4L05	KLD Type 1M	0.44	N/A	Pass
C4L06	Bedroom	0.42	7.5	Pass
C4L06	Bedroom 1	1.36	1.25	Pass
C4L06	Bedroom 1 Type 4AM	0.37	1.5	Pass
C4L06	Bedroom 2 Type 4AM	1.63	1.75	Pass
C4L06	Bedroom 2	0.00	1.5	Pass
C4L06	Bedroom 3	0.13	1	Pass
C4L06	Bedroom 4	0.00	2.25	Pass
C4L06	Bedroom 5	0.09	1.25	Pass
C4L06	Bedroom 1	0.02	1.25	Pass

Results - Predominantly Naturally Ventilated Homes

Block and Level	Zone	Criterion A %	Criterion B hr	Pass/Fail
C4L06	Bedroom 2	0.17	1.5	Pass
C4L06	KLD	0.28	N/A	Pass
C4L06	KLD Type 4AM	0.49	N/A	Pass
C4L06	KLD 1	0.28	N/A	Pass
C4L06	KLD 2	0.80	N/A	Pass
C4L06	KLD 3	0.73	N/A	Pass
C5L00	Bedroom 1 Type 39M	0.72	8.75	Pass
C5L01	Bedroom 2 Type 39M	2.08	25.75	Pass
C5L01	KLD Type 39M	0.36	N/A	Pass
C5L01	KLD Type 29	0.85	N/A	Pass
C5L01	Bedroom 2 Type 42	1.83	25.5	Pass
C5L01	KLD Type 42 1	0.36	N/A	Pass
C5L03	Bedroom Type 12M	1.16	1.5	Pass
C5L03	Bedroom 1 Type 19	0.10	1.5	Pass
C5L03	Bedroom 2 Type 19	0.20	1.5	Pass
C5L03	Bedroom 3 Type 19	0.20	1.75	Pass
C5L03	KLD Type 12M	0.79	N/A	Pass
C5L03	Bedroom 1 Type 21	0.10	25	Pass
C5L03	Bedroom 2 Type 21	0.00	24.5	Pass
C5L03	KLD Type 21	0.30	N/A	Pass
C5L03	KLD Type 19	0.32	N/A	Pass
C5L04	Bedroom 2	1.93	1.75	Pass
C5L04	Bedroom 3	0.13	1.75	Pass
C5L04	Bedroom 3	0.14	2.5	Pass
C5L04	Bedroom 1	0.06	31	Pass
C5L04	Bedroom 2	0.22	29.25	Pass
C5L04	KLD	0.33	N/A	Pass
C5L04	KLD 1	0.59	N/A	Pass
C5L05	Bedroom Type 24	0.06	1.5	Pass
C5L05	KLD Type 24	0.65	N/A	Pass
C5L05	Bedroom Type 23	0.06	26.75	Pass

Results - Predominantly Naturally Ventilated Homes

Block and Level	Zone	Criterion A %	Criterion B hr	Pass/Fail
C5L05	KLD Type 23	0.98	N/A	Pass
C6L00	Bedroom 2 Type 43	0.45	25.33	Pass
C6L00	KLD Type 43	1.19	N/A	Pass
C6L00	Bedroom 1 Type 45	0.00	11.25	Pass
C6L00	KLD Type 45 0	0.15	N/A	Pass
C6L00	Bedroom 1Type 44M	0.00	10.75	Pass
C6L00	KLD Type 44M	0.38	N/A	Pass
C6L01	Bedroom 1 Type 43	0.22	29.75	Pass
C6L01	Bedroom 3 Type 43	1.06	30	Pass
C6L01	Living Room Type 43	2.37	N/A	Pass
C6L01	Bedroom 2 Type 45	0.64	22.25	Pass
C6L01	Bedroom 3 Type 45	0.53	19.5	Pass
C6L01	Living Room Type 45	1.42	N/A	Pass
C6L01	Bedroom 2 Type 44M	1.97	22.25	Pass
C6L01	Bedroom 3 Type 44M	2.19	25.5	Pass
C6L01	Living Room Type 44M	1.25	N/A	Pass
C6L02	Bedroom 1 Type 17M	0.98	1.5	Pass
C6L02	Bedroom 1 Type 17	2.86	28.33	Pass
C6L02	Bedroom 2 Type 17	2.32	28.67	Pass
C6L02	KLD Type 17	2.63	N/A	Pass
C6L02	Bedroom 1 Type 15	2.00	29	Pass
C6L02	Bedroom 2 Type 15	2.67	30.5	Pass
C6L02	Living Room Type 15	2.83	N/A	Pass
C6L02	Bedroom 2 Type 17M	0.52	30	Pass
C6L02	KLD Type 17M	0.98	N/A	Pass
C1L00	Kitchen Type 33M	0.00	N/A	Pass
C1L04	Bedroom 1 Type 22	0.47	12.83	Pass
C1L04	Bedroom 2 Type 22	0.28	9.17	Pass
C1L04	KLD Type 22	0.33	N/A	Pass
C1L04	Bedroom 1 Type 52	0.03	7.33	Pass
C1L04	KLD Type 52	0.43	N/A	Pass

Results - Predominantly Naturally Ventilated Homes

Block and Level	Zone	Criterion A %	Criterion B hr	Pass/Fail
C2L00	Bedroom 1 Type 32	0.00	12.75	Pass
C2L00	KLD Type 32	0.09	N/A	Pass
C2L00	Bedroom 3 Type 33	0.00	9.75	Pass
C2L00	Kitchen Type 33	0.00	N/A	Pass
C2L01	Bedroom 1 Type 33	0.00	20.75	Pass
C2L01	Bedroom 2 Type 33	0.09	26	Pass
C2L01	Living Type 33	0.13	N/A	Pass
C2L01	Bedroom 1 Type 25	0.00	28	Pass
C2L01	KLD Type 25	0.23	N/A	Pass
C2L06	Bedroom 1 Type 2A	0.26	7.5	Pass
C2L06	Bedroom 2 Type 2A	0.38	9.83	Pass
C2L06	KLD Type 2A	0.65	N/A	Pass
C2L06	Bedroom 1 Type 53	0.26	12	Pass
C2L06	Bedroom 2 Type 53	0.26	9.33	Pass
C2L06	KLD Type 53	0.62	N/A	Pass
C2L06	Bedroom 1 Type 54	0.05	9	Pass
C2L06	KLD Type 54	0.09	N/A	Pass
C4L00	Bedroom 1 Type 32M	0.00	14	Pass
C4L00	KLD Type 32M	0.04	N/A	Pass
C4L00	Bedroom 3 Type 33M	0.00	15.75	Pass
C4L01	Bedroom 1 Type 25M	0.04	29	Pass
C4L01	Bedroom 1 Type 33M	0.00	32	Pass
C4L01	Bedroom 2 Type 33M	0.21	5.67	Pass
C4L01	Living Type 33M	0.16	N/A	Pass
C4L01	KLD Type 25M	0.24	N/A	Pass
C4L06	Bedroom 1 Type 54M	0.21	8.33	Pass
C4L06	KLD Type 54M	0.43	N/A	Pass
C4L06	Bedroom 1 Type 53M	0.23	11.83	Pass
C4L06	Bedroom 2 Type 53M	0.35	10.5	Pass
C4L06	KLD Type 53M	0.82	N/A	Pass
C4L06	Bedroom 1 Type 2AM	0.23	10.33	Pass

Results - Predominantly Naturally Ventilated Homes

Block and Level	Zone	Criterion A %	Criterion B hr	Pass/Fail
C4L06	Bedroom 2 Type 2AM	0.72	12.5	Pass
C4L06	KLD Type 2AM	1.73	N/A	Pass
C4L06	Bedroom 1 Type 3	0.17	9.17	Pass
C4L06	KLD Type 3	0.43	N/A	Pass
C5L04	Bedroom 1 Type 49	0.05	19.75	Pass
C5L04	Bedroom 2 Type 49	0.09	7.33	Pass
C5L04	Bedroom 3 Type 49	0.10	25.75	Pass
C5L04	KLD Type 49	0.16	N/A	Pass
C5L04	Bedroom 1 Type 51	0.05	7.17	Pass
C5L04	Bedroom 2 Type 51	0.00	31.25	Pass
C5L04	KLD Type 51	0.00	N/A	Pass
C5L04	Bedroom 1 Type 50	0.28	8.33	Pass
C5L04	KLD Type 50	0.52	N/A	Pass

Passive Design Measures

The following cooling hierarchy has been applied to the development to mitigate the risk of overheating.

1) reduce the amount of heat entering a building through orientation, shading, high albedo materials, fenestration, insulation and the provision of green infrastructure

High Performance Glazing - Windows of high performance will be provided to all units. These will have a low U-value to reduce heat losses during winter and heat transfer from outside during summer using solar control glass of with a g-value of 0.4, minimising solar energy being transmitted through the windows.

Shading - Balconies have been incorporated into the design providing shading to the rooms below.

2) minimise internal heat generation through energy efficient design

Energy efficient lighting & appliances - Internal heat generation is minimised through the selection of LED, energy efficient lighting. A-rated appliances that emit low heat gains will also be used throughout the scheme to reduce internal gains.

Heat distribution infrastructure - Well insulated pipework will be specified to reduce heat losses from the hot water pipes running across the dwellings thus increasing the internal temperature.

3) manage the heat within the building through exposed internal thermal mass and high ceilings

4) provide passive ventilation

Openable windows used for removal of excess heat where allowable in relation to the noise report

5) provide mechanical ventilation

MVHR with summer bypass specified. Sufficiently high flow rates as set out within report to overcome overheating where possible.

6) provide active cooling systems.

Where the noise report indicates windows are closed at night, the majority of dwellings will require cooling via hybrid cooling units. These do not set an internal temperature and are therefore not classed as comfort cooling, but temper incoming supply air to mitigate overheating

Guidelines on Managing the risk of Overheating

The following mitigation measures should be considered during the event of a heatwave to minimise the risk of overheating in the new dwellings and ensure comfort level for the future occupants. These should be included in the Home User Guide distributed to the occupants.

• Comprehensive instructions on how to operate the windows and the curtains should be given to the future occupants to control thermal comfort in their rooms.

• Occupants should ensure that during summer if the internal room temperatures raise over 22 degrees, windows should be left open. However, if the external temperature is higher than internal temperature (in hot summer days) windows need to remain closed for the period that the external temperature is higher than internal temperature and then they should be opened again.

• If available, the occupants should be advised to leave their windows open during the hot summer nights such that the cooler external air can cool the room down during the night.

• The occupants should be advised to ensure the curtains will be used throughout the sunny days to prevent direct solar gain to the rooms.

• The occupants should be advised to ensure the curtains/blinds partially cover the windows such that it prevents solar gains but it also allows air movement into the rooms. Curtains will be designed and installed such that the main openable area of the window is not fully covered but allow for some air flow.

• The fixed building elements such as ceiling lights, and fridges will all be very energy efficient. It is essential that the occupants also use energy efficient equipment's, for example energy efficient light fittings of LED types and A+ rated electrical appliances such as TV that consume less energy should be specified and promoted to reduce internal heat gains. Occupants should be advised against prolonged use of any appliances during hot summer days.

Conclusion & Part O Checklist

The building as designed has been found to meet the TM59 thermal comfort criteria in all of the tested zones.

The scheme has implemented passive and active design measures to mitigate the risk of overheating. The modelling results indicate that the scheme is fully compliant with the overheating requirements as set out in CIBSE TM59 in the current weather scenario.

The proposal maximises passive and active design measures by responding to the local context in the following ways:

- Energy efficient lighting and appliances have been recommended to reduce internal heat gains;
- The building fabric will be insulated over and above the standards set out by Building Regulations and reduced solar gains from glazing solar factors as low as 0.38;
- Mechanical Ventilation specified with sufficient Flow Rate and Air Changes per Hour (ACH);
- MVHR capable of providing 82 l/s flow rate. Hybrid cooling utilised on flats where MVHR not shown to overcome overheating, as per ventilation schedule provided

Building address:	Nestle Block C
Proposed building use/type of building:	Residential
Are there any security, noise or pollution issues?	RBA Acoustic Report limits bedroom window opening
Part O Assessor	Gareth Thomas Briary Energy Ltd 17a The Broadway, Hatfield, AL9 5HZ
Dynamic software name and version	Design Builder, v7.1.3.015
Weather file location used	The CIBSE Design Summer Year (DSY1), London Heathrow, for the 2020s, high emissions, 50% percentile scenario.
Number of sample units modelled	60
Has the project passed the assessment described in CIBSE's TM59?	Yes
Shading incorporated into model	None
Details of the occupancy profiles used	DesignBuilder TM59 Occupation Profiles
Details of the equipment profiles used	DesignBuilder TM59 Equipment Profiles
Details of the opening profiles used	DesignBuilder TM59 Opening Profiles
Free areas	Calculated per opening
Infiltration flow rates	Approx. $2m^3/h/m^2$ @50pa
Window g-value	G-Value - 0.38
Shading strategy	n/a
Mechanical cooling	MVHR capable of providing 82 l/s flow rate. Hybrid cooling utilised on flats where MVHR not shown to overcome overheating, as per ventilation schedule provided
The building construction proposal been modelled accurately	G.Thomas 05-Aug-2025