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14 Devonshire Mews, Chiswick, London W4 2HA
Tel: 020 8995 7848 Fax: 020 8711 5732 office@mzaplanning.com www.mzaplanning.com

TOWN AND COUNTRY PLANNING ACT 1990
(AS AMENDED)

PLANNING STATEMENT

On Behalf of Mr E Ermakov & Ms E Arkhangelskaya

Flat 17, 55-59 Saffron Hill, Holborn, London, EC1N 8QX

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ACCOMPANYING DOCUMENTS

- Plant Noise Assessment ref 13293.RP01.PNA.0 (RBA Acoustics)
- TM59 Overheating Risk Assessment ref n/a (L2 Energy Consulting)

1 SITE AND SURROUNDINGS

1.1 The application site comprises an apartment block on the eastern side of Saffron Hill in the Holborn area of London Borough of Camden.

1.2 The surrounding area is mixed use residential/commercial in character with accommodation in apartment blocks together with office/business premises along Saffron Hill.

1.3 The property is within the defined Hatton Garden area, forms part of a designated 'Protected View' and 'Primary/Secondary Frontage'. The site is located in the Hatton Garden Conservation Area but does not comprise a statutorily listed building.

2 PLANNING HISTORY

2.1 There are no relevant applications shown for the particular site on the London Borough of Camden Council website.

3 EXISTING DEVELOPMENT

3.1 Within this application, the objective is for retention of 2 air source heat pumps [ASHP] on the floor of a balcony on the side elevation of the building. This statement should therefore be read alongside the accompanying Plant Noise Assessment ref 13293.RP01.PNA.0 (RBA Acoustics).

3.2 It should be highlighted that the installations serve residential premises in a defined mixed-use area where such units are commonly found. They are in highly discrete positions along the side elevation behind a balcony parapet wall on a 6th floor flat and do not impact upon the main building frontage.

3.3 The development has important environmental benefits in that the air source heat pumps are primarily used for heating and enable buildings to be heated and cooled more. This has become more important given very recent events affecting energy supplies and the effects of climate change where alternatives to fossil fuels such as gas are being sought. It should

be highlighted that such installations are designed to replace less efficient gas boilers with consequent eco-friendly benefits.

3.4 The development represents sustainable development that minimises the effects of the climate change. This is clearly shown by dynamic thermal modelling which demonstrates that by using air to air heat pumps the total electricity contribution including heating AND cooling will be lower, resulting in less CO2 emission every year.

4 PLANNING POLICY

- MCHLG National Planning Policy Framework (2023) [NPPF]
- MCHLG National Planning Practice Guidance (2022) [NPPG]
- GLA London Plan (2021)
- GLA Character and Context SPG (2014)
- GLA Sustainable Design and Construction SPG (2014)
- London Borough of Camden Local Plan (2017)
    - Policy G1 Delivery and location of growth
    - Policy A1 Managing the impact of development
    - Policy A4 Noise and vibration
    - Policy D1 Design
    - Policy D2 Heritage
    - Policy CC2 Adapting to climate change
- Supplementary Planning Guidance:
    - Camden Planning Guidance (CPG) Amenity (2021)
    - Camden Planning Guidance (CPG) Design (2021)
    - Camden Planning Guidance (CPG) Energy efficiency and adaptation (2021)
    - Hatton Garden Conservation Area Appraisal and Management Strategy (2017)

<u>GLA London Plan (2021)</u>

<u>Policy D4 Delivering good design</u>

4.1 Policy D4 outlines that design quality should be retained through to completion. It aims to essentially promote good design and seek to ensure that development positively contributes to the character and appearance of the surrounding built environment.

Policy D14 Noise

4.2 This policy states the general principles around need to reduce, manage and mitigate potential noise impacts on health and quality of life.

Policy HC1 Heritage conservation and growth

4.3 This policy states that development proposals affecting heritage assets, and their settings, should conserve their significance, being sympathetic to the assets' significance and appreciation within their surroundings.

Policy SI4 Managing heat risk

4.4 This policy refers to the 'cooling hierarchy' underpinning Camden's sustainable energy aims and states: *Development proposals should minimise adverse impacts on the urban heat island through design, layout, orientation, materials and the incorporation of green infrastructure.*

London Borough of Camden Local Plan (2017)

Policy G1 'Delivery and location of growth'

4.5 This is a general policy that sets out the Council's overall strategy towards development including the following reference: *"a) supporting development that makes best use of its site, taking into account quality of design, its surroundings, sustainability, amenity, heritage, transport accessibility and any other considerations relevant to the site"*.

Policy A1 Managing the impact of development

4.6 This is concerned with specific criteria relating to amenity stating: *The Council will seek to protect the quality of life of occupiers and neighbours. We will grant permission for development unless this causes unacceptable harm to amenity.*

We will:

a. seek to ensure that the amenity of communities, occupiers and neighbours is protected;

d. require mitigation measures where necessary.

The factors we will consider include:

e. visual privacy, outlook;

j. noise and vibration levels;

l. microclimate

It is considered that the development accords with these amenity requirements by minimising noise emissions at a high level of the front/side of the building behind a balcony parapet. Thereby the installations avoid effects on the microclimate and would not harm the amenities of neighbouring occupiers.

Policy A4 'Noise and Vibration'

4.7 *The Council will seek to ensure that noise and vibration is controlled and managed.*

Development should have regard to Camden's Noise and Vibration Thresholds (Appendix 3). We will not grant planning permission for:

1. *development likely to generate unacceptable noise and vibration impacts; or*
2. *development sensitive to noise in locations which experience high levels of noise, unless appropriate attenuation measures can be provided and will not harm the continued operation of existing uses.*

We will only grant permission for noise generating development, including any plant and machinery, if it can be operated without causing harm to amenity. We will also seek to minimise the impact on local amenity from deliveries and from the demolition and construction phases of development.

This policy requires that such developments should be sympathetic to the host building use and the need to respect surrounding amenities with regard to noise and vibration. It is considered that all the above criteria are met in this case.

Policy D1 'Design'

4.8 *The Council will seek to secure high quality design in development. The Council will require that development:*

a. respects local context and character;
b. preserves or enhances the historic environment and heritage assets in accordance with Policy D2 Heritage;
c. is sustainable in design and construction, incorporating best practice in resource management and climate change mitigation and adaptation;
d. is of sustainable and durable construction and adaptable to different activities and land uses;
e. comprises details and materials that are of high quality and complement the local character;
f. integrates well with the surrounding streets and open spaces,
m. preserves strategic and local views;
o. carefully integrates building services equipment.
This advocates that development in Camden should incorporate various features including scale, materials and detailing. The installations are carefully positioned out of view and integrated meaning they preserve the character and appearance of the area. in terms of scale, design, materials.

Policy D2 'Heritage'

4.9 *The Council will preserve and, where appropriate, enhance Camden's rich and diverse heritage assets and their settings, including conservation areas…*
The Council will:
e. require that development within conservation areas preserves or, where possible, enhances the character or appearance of the area…
The units retain the original fabric of the building whilst being discretely scaled and located on an upper floor balcony, screened by the parapet wall and lacking any visual design or heritage impact whatsoever which enables them to fully comply with this policy.

Policy CC2 Adapting to climate change

4.10 *The Council will require development to be resilient to climate change. All development should adopt appropriate climate change adaptation measures such as:*
d. measures to reduce the impact of urban and dwelling overheating, including application of the cooling hierarchy.

The air conditioning/air source heat pump units are discretely scaled and positioned with regard to sustainability and amenity requirements and their manufacturing specifications accord with this policy.

Camden Planning Guidance (CPG) Amenity (2021)

4.11 At Paragraph 6.4, it is stated that acoustic reports should accompany applications for plant, ventilation, air extraction or conditioning equipment and flues. Under 'Mitigating Noise Impacts' the guidance outlines measures that can be taken with such plant/machinery.

Camden Planning Guidance (CPG) Design (2021)

4.12 With relevance to 'Building services equipment', the guidance states that such equipment:

- *should not harm occupant or neighbour amenity, health and/or wellbeing;*
- *be incorporated into the host building aesthetically;*
- *have a minimal impact on the environment; and*
- *not harm listed buildings, conservation areas or streetscapes.*

4.13 Paragraph 9.18 reads: *"In refurbished development, plant and machinery should be accommodated within the building structure, or incorporated into the design of external modifications. External plant or machinery should be avoided. If unavoidable, external plant or machinery should be positioned to minimise its visual impact".*

4.14 Paragraph 9.19 lists other design considerations including:

- *use of screening or other techniques to minimise the impacts of plant, machinery and ducting must, in themselves, not cause visual blight.*
- *plant and machinery on roofs should not be visible from the street, public vantage points or from immediately adjacent buildings.*
- *the design and materials used for plant, machinery and ducting, as well as for ancillary structures such as screening, where located on the exterior of the building, must be consistent with those of the building.*

4.15 Paragraph 9.20 lists various criteria for equipment in conservation areas including:

- *Installations must be in keeping with the design and materials of the building.*
- *Installations should minimise the loss of, and permanent damage to, the historic fabric.*
- *It should be carefully considered whether installing building services equipment internally or externally is most appropriate way to minimise harm.*

4.16 Paragraph 9.21 states: *Design considerations for building services equipment in conservation areas include the following:*

- *The visual impact of building services equipment should be considered, including views into and from conservation areas.*

4.17 Under 'Air conditioning and renewable energy', Paragraph 9.22 states: *"Active cooling (air conditioning) will only be permitted where dynamic thermal modelling demonstrates that there is clear need for it and after other measures have been considered. All new development should submit a statement demonstrating how the 'cooling hierarchy' set out in London Plan has been considered".*

Camden Planning Guidance (CPG) Energy efficiency and adaptation (2021)

4.18 Under 'Efficient ventilation and cooling', the guidance states: *"Local Plan Policy CC2 discourages active cooling (air conditioning). Air conditioning will only be permitted where thermal modelling demonstrates a clear need for it after all preferred measures are incorporated in line with the London Plan cooling hierarchy…"*. Such thermal modelling is included within the TM59 Overheating Risk Assessment accompanying this submission (L2 Energy Consulting).

Hatton Garden Conservation Area Appraisal and Management Strategy (2017)

4.19 This document highlights the historic origins of Saffron Hill. At Paragraph 4.23 it is highlighted that the street suffered particularly badly from Second World War damage.

5 PLANNING ASSESSMENT

Principle of development

5.1 This statement should be read alongside the Plant Noise Assessment (ref no: 12810.RP01.PNA.0) (RBA Acoustics) accompanying this application and the TM59: Overheating Risk Assessment (L2 Energy Consulting). The site falls within the defined Hatton Garden area, the Hatton Garden Conservation Area and forms part of a designated 'Protected View' and 'Primary/Secondary Frontage' according to the Local Plan Proposals Map. Consequently, the above policies within the Local Plan and issues apply.

5.2 Paragraph 164 of the NPPF states:

"In determining planning applications, local planning authorities should give significant weight to the need to support energy efficiency and low carbon heating improvements to existing buildings, both domestic and non-domestic (including through installation of heat pumps and solar panels where these do not already benefit from permitted development rights). Where the proposals would affect conservation areas, listed buildings or other relevant designated heritage assets, local planning authorities should also apply the policies set out in chapter 16 of this Framework."

5.3 As such, providing neighbouring amenities are protected, the principle of development of air source heat pumps discretely placed on a flat roof rear extension of the building is acceptable – as verified by the accompanying Plant Noise Assessment – and thereby consistent with the provisions of Policies D4, D14, HC1 and S14 of the London Plan and Policies G1, A1, A4, D1, D2 and CC2 of the Local Plan.

Design, character and appearance

5.4 In summary, it can be considered that against policy criteria on these grounds, the installations subject of this application are not highly visible from the public domain and therefore do not have any substantive detrimental effect related to size, design and materials on the surrounding architectural and aesthetic qualities.

5.5 In support of this, it is highlighted that the units are located away from plain view as far as possible, being fixed on a flat behind the balcony

parapet wall of a flat on the 6th floor of the building. These areas of the front/side elevations are particularly well concealed given the main frontage remains completely unaffected in the building's Saffron Hill location. The installations subject of this application are appropriately scaled and designed, being wholly concealed from street view and therefore compliant with Policies G1, D1 and D2 of the Local Plan.

Residential amenities

5.6 There are no identifiable issues of harm to amenities of occupants of neighbouring properties that arise from this development with particular regard to noise. It is submitted that any noise is well contained within the immediate vicinity because of the small scale of the units and their positions on the main front/side elevation balcony behind walls with regard to separation distances to neighbouring dwellings.

5.7 As confirmed by the Plant Noise Assessment accompanying this application, noise is not unduly over and above what is currently experienced in a mixed use (including residential) city centre context. This concludes that: *"The results of our assessments indicate that noise from the installed plant items is not expected to cause an observable adverse effect on the occupants of the nearby noise sensitive properties, and is in accordance with the adopted plant noise emission limits"* (RBA Acoustics).

5.8 It can be concluded that there are no unduly harmful impacts to the amenities and outlook of neighbouring residential properties arising from the units. Therefore, the development can be considered to protect the living conditions of neighbours in accordance with the aims and provisions of the relevant London Plan (D3, D6, D14) and LB Camden Local Plan policies (G1, A1 and A4).

Heritage

5.9 As regards the heritage aspects, the units are subordinate in height and width in comparison to the balcony wall on the host apartment building which is in keeping with the character and appearance of Hatton Garden Conservation Area whose significance derived from varying architectural styles and high-quality older buildings along the traditional side streets.

5.10 The installations subject of this application would not be visible from the public domain and therefore would not have any detrimental effect related to size, design and materials on the surrounding architectural and aesthetic qualities along Saffron Hill. The units would be in a matching material to others in the vicinity whilst being fully sympathetic with the appearance and character of the conservation area in line with Policies D1 and D2 of the Local Plan and the London Plan.

Cooling hierarchy

5.11 A heat assessment was also undertaken in compliance with LB Camden Council's planning policies regarding air source heat pumps. This concludes that: *"When following the cooling hierarchy in accordance with the Camden Local Plan, it is demonstrated that active cooling should be allowable within this dwelling as all other options within the hierarchy have been explored and tested within the realms of the existing flat to bring the flat within reasonable comfort levels as set by CIBSE TM59. The dynamic thermal modelling proved that satisfactory comfort levels are not achievable without active cooling. Furthermore, the installation of high efficiency heat pumps to provide both heating and cooling would saving in the order of 560 Kg of CO2 being emitted into the atmosphere each year, another valuable statistic in favour of the installation of heat pumps"*.

5.12 In a recent appeal decision Ref: APP/X5210/D/23/3322161 for Installation of external air conditioning units and associated acoustic enclosure within the rear side courtyard the Inspector stated in paragraph:

"Had an ASHP been acceptable in principle when assessed against the relevant energy and cooling hierarchies, it would be for the appellant to consider how much electricity is required to work the pump versus the energy savings of providing heating and cooling. Carbon calculations would need to be submitted to show that their use for heating is more efficient than gas."

5.13 It is noteworthy that the report accompanying this application produced L2 Energy Consulting and produced in the Appendices of this statement mentions on page 12:

"There is no Gas connection to this building, however the carbon factor for gas is 0.21 Kg/CO2 per KWh whilst electricity is 0.136 Kg/CO2 per KWh, therefore electric solutions are much less carbon intensive."

5.14 It is therefore submitted that the proposed development would be efficient and reduce the carbon footprint and complies with the provisions of paragraph 164 of the NPPF which supports energy efficiency.

5.15 In relation to local policy and guidance, the heat assessment which includes thermal modelling and comparison with other measures finds that the installations are satisfactory. It is therefore considered that the units meet the criteria within Policy SI4 of the London Plan and Policies G1, A1 and CC2 of the Local Plan as well as Camden Planning Guidance.

6 CONCLUSION

6.1 The air source heat pumps are in keeping with the character and appearance of the host property and surrounding area which consists of a side street in a Central London location. Other such installations are present at neighbouring premises in this mixed residential/commercial area.

6.2 The development protects the amenity of neighbouring occupants as the unit would not produce harmful noise levels.

6.3 The air source heat pump constitutes a more efficient heating system resulting in a net reduction of electricity being used to heat and cool the property. This would result in a net reduction in the emissions of CO2 every year. The proposal complies with the Council's Energy Efficiency and adaptation guidance 2021, in particular para. 5.16 of the document states "ASHPS need to have a COP of more than 4 to be more efficient than a conventional heating system" It is noteworthy that the both units exceed the stated COP threshold. Data sheets showing this are produced in the appendices of this statement.

6.4 It is considered that given as the air source heat pumps are relatively small, cannot be seen from the public domain or in long range views and do not cause adverse effects to neighbouring amenities, the

development is fully compliant with the relevant policies. The proposal would not be harmful to the conservation area and is in accordance with the NPPF, London Plan) policies D4, D14, HC1 and S14; LB Camden Local Plan (2013) policies G1, A1, A4, D1, D2 and CC2 and other guidance, and can therefore be considered acceptable.

6.5 The Council are respectfully requested to grant planning permission for the development. However, should there be any questions or need for clarification, please do not hesitate to contact us.

APPENDIX 1

Air Source Heat Pump specifications (Manufacturer)

1. Specifications

Type					Wall mounted	
					Inverter heat pump	
Model name					ASYG18KMTA	ASYG24KMTA
Power supply					230 V ~ 50 Hz	
Power supply intake					Outdoor unit	
Available voltage range					198—264 V	
Capacity		Cooling	Rated	kW	5.20	7.10
				Btu/h	17,700	24,200
			Min.—Max.	kW	0.90—6.00	0.90—8.30
				Btu/h	3,100—20,500	3,100—28,300
		Heating	Rated	kW	6.30	8.00
				Btu/h	21,500	27,200
			Min.—Max.	kW	0.90—8.70	0.90—10.10
				Btu/h	3,100—29,600	3,100—34,400
Input power		Cooling	Rated	kW	1.39	2.08
			Min.—Max.		0.09—1.66	0.24—3.15
		Heating	Rated		1.56	1.91
			Min.—Max.		0.09—2.86	0.14—3.00
		Fan	HIGH	W	37.5	61.6
			MED		22.9	26.7
			LOW		13.3	13.3
			QUIET		8.2	8.2
Current		Cooling	Rated	A	6.1	9.3
		Heating			7.0	8.6
EER		Cooling		kW/kW	3.74	3.41
COP		Heating			4.04	4.19
Sensible capacity		Cooling		kW	4.05	5.30
Power factor		Cooling		%	98	98
		Heating			98	96
Moisture removal				L/h (pints/h)	1.7 (3.0)	2.7 (4.8)
Maximum operating current *1		Cooling		A	9.5	13.5
		Heating			13.5	16.0
Fan	Airflow rate	Cooling	HIGH	m^3/h	980	1,170
			MED		810	850
			LOW		640	640
			QUIET		510	510
		Heating	HIGH		1,020	1,170
			MED		850	850
			LOW		640	640
			QUIET		510	510
	Type × Q'ty				Cross flow fan × 1	
	Motor output			W	59	
Sound pressure level *2		Cooling	HIGH	dB (A)	45	49
			MED		40	40
			LOW		35	35
			QUIET		29	29
		Heating	HIGH		46	49
			MED		40	40
			LOW		35	35
			QUIET		29	29
Heat exchanger type		Dimensions (H × W × D)		mm	Main1: 210 × 798 × 26.6, Main2: 135 × 798 × 20 Sub1: 84 × 798 × 13.3, Sub2: 84 × 798 × 13.3	
		Fin pitch			Main1: 1.2, Main2: 1.1 Sub1: 1.4, Sub2: 1.4	
		Rows × Stages			Main1: 2 × 10, Main2: 2 × 8 Sub1: 1 × 4, Sub2: 1 × 4	
		Pipe type			Copper	
		Fin type			Aluminum	
Enclosure		Material			Polystyrene	
		Color			White Approximate color of Munsell N 9.25/	
Dimensions (H × W × D)		Net		mm	280 × 980 × 240	
		Gross			322 × 1,078 × 346	
Weight		Net		kg	12.5	
		Gross			18	
Connection pipe		Size	Liquid	mm (in)	Ø 6.35 (Ø 1/4)	
			Gas		Ø 12.70 (Ø 1/2)	
		Method			Flare	
Drain hose		Material			PP + HDPE	
		Size		mm	Ø 13.8 (I.D.), Ø 15.8 to Ø 16.7 (O.D.)	
Operation range		Cooling		°C	18 to 32	
				%RH	80 or less	
		Heating		°C	16 to 30	
Remote control					Wireless remote controller (Option: Wired remote controller, Mobile app*3 [FGLair™])	

NOTES:

- Specifications are based on the following conditions:
  - Cooling: Indoor temperature of 27 °CDB/19 °CWB, and outdoor temperature of 35 °CDB/24 °CWB.
  - Heating: Indoor temperature of 20 °CDB/15 °CWB, and outdoor temperature of 7 °CDB/6 °CWB.
  - Pipe length: 5 m, Height difference: 0 m. (Between outdoor unit and indoor unit.)
- Protective function might work when using it outside the operation range.
- *1: Maximum operating current is the total current of the indoor unit and the outdoor unit.
- *2: Sound pressure level:
  - Measured values in manufacturer's anechoic chamber.
  - Because of the surrounding sound environment, the sound levels measured in actual installation conditions might be higher than the specified values here.
- *3: Available on Google Play™ store or on App Store®. Optional WLAN adapter is also required. For details, refer to the setting manual.

OUTDOOR UNIT
AOYG14-18KBTA2

1. Specifications

Type					Inverter heat pump	
Model name					**AOYG14KBTA2**	**AOYG18KBTA2**
Power source					230 V 50 Hz	
Available voltage range					198—264V	
Standard combination of indoor unit					Wall mounted ASYG07KGTB ×2	Wall mounted ASYG09KGTB ×2
Capacity		Cooling	Rated	kW	4.0	5.0
				Btu/h	13,600	17,100
			Min.—Max.	kW	1.4—4.6	1.7—5.8
				Btu/h	4,700—15,700	5,800—19,800
		Heating	Rated	kW	4.4	5.6
				Btu/h	15,000	19,100
			Min.—Max.	kW	1.1—5.5	1.8—6.6
				Btu/h	3,700—18,800	6,100—22,500
Input power		Cooling	Rated	kW	0.97	1.24
			Max.		1.20	1.55
		Heating	Rated		0.95	1.22
			Max.		1.65	1.80
Current		Cooling	Rated	A	4.7	5.6
		Heating	Rated		4.7	5.6
EER		Cooling		kW/kW	4.12	4.03
COP		Heating			4.63	4.59
Starting current				A	4.7	5.6
Maximum operating current *1				A	10.9	11.6
Fan		Type × Q'ty			Propeller × 1	
		Airflow rate	Cooling	m^3/h	1,670	1,960
			Heating		1,670	2,020
		Motor output		W	23	49
Sound pressure level *2		Cooling		dB (A)	47	47
		Heating			49	50
Heat exchanger		Dimension (H x W x D)		mm	504 × 881 × 18.19 504 × 851 × 18.19	588 × 881 × 18.19 588 × 851 × 18.19
		Fin pitch			1.3	
		Rows × Stages			Main1: 1 × 24 Main2: 1 × 24	
		Pipe type (Material)			Copper tube	
		Fin type (Material)			Aluminum	
Compressor		Type × Quantity			DC rotary × 1	DC twin rotary × 2
		Motor output		W	900	900
Refrigerant		Type			R32 (675)	
		Charge		g	900	1,020
Refrigerant oil		Type			RB68A	FW68S
		Amount		cm^3	340	350
Enclosure		Material			Steel sheet	
		Color			Beige (Approximate color of Munsell 10YR 7.5/1.0 NN)	
Dimensions (H x W x D)		Net		mm	542 × 799 × 290	632 × 799 × 290
		Gross			602 × 940 × 375	692 × 940 × 375
Weight		Net		kg	33	37
		Gross			37	41
Connection pipe	Size	Liquid		mm (in)	Ø6.35 (Ø1/4) × 2	
		Gas			Ø9.52 (Ø3/8) × 2	
	Method				Flare	
	Pre-charge length (Total)			m	20	
	Maximum length (Total)				30	
	Maximum length (Each)				20	
	Minimum length (Total)				5	
	Minimum length (Each)				2.5	
	Maximum height difference between outdoor unit and each indoor units.				15	
	Maximum height difference between indoor units.				10	
Operation range		Cooling		°C	-10 to 46	
		Heating			-15 to 24	

NOTES:

- Specifications are based on the following conditions:
  - Power source of specifications: 230 V
  - Pipe length: 5 m, Height difference: 0 m [Outdoor unit—Indoor unit]
  - Cooling: Indoor temperature of 27.0 °CDB/19.0 °CWB, and outdoor temperature of 35 °CDB/24.0 °CWB.
  - Heating: Indoor temperature of 20.0 °CDB/15.0 °CWB, and outdoor temperature of 7.0 °CDB/6.0 °CWB.
- *1: Maximum operating current is the total current of the indoor unit and the outdoor unit.
- *2: Sound pressure level
  - Measured values in manufacturer's anechoic chamber.
  - Because of the surrounding sound environment, the sound levels measured in actual installation conditions might be higher than the specified values here.
- For other combination, refer to the combination table.
- The protective function might work when using it outside the operation range.

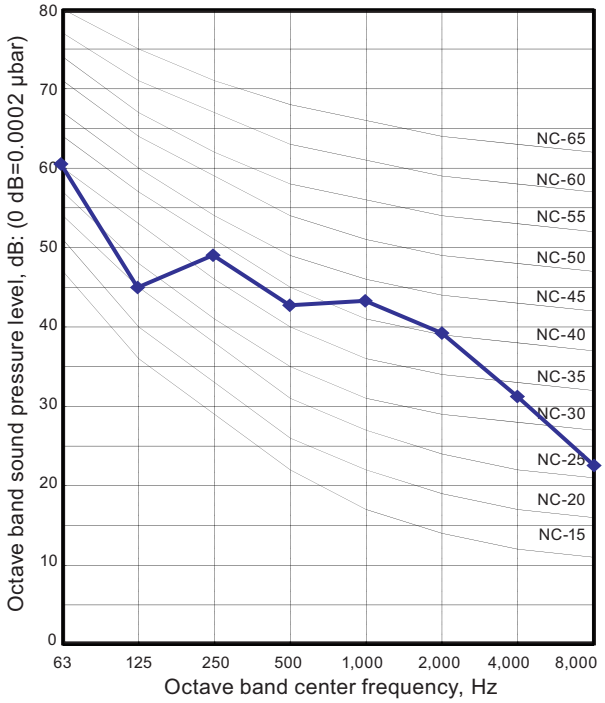
OUTDOOR UNIT
AOYG14-18KBTA2

10. Operation noise (sound pressure)

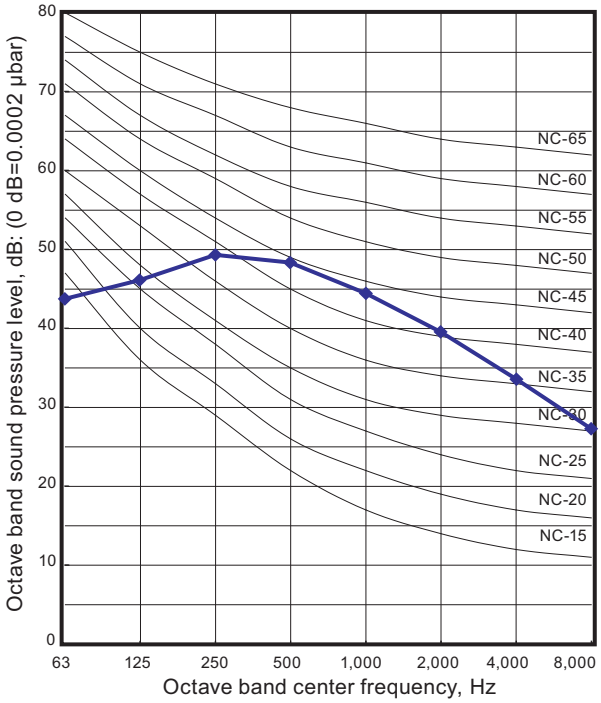
10-1. Noise level curve

■ Model: AOYG14KBTA2

● Cooling

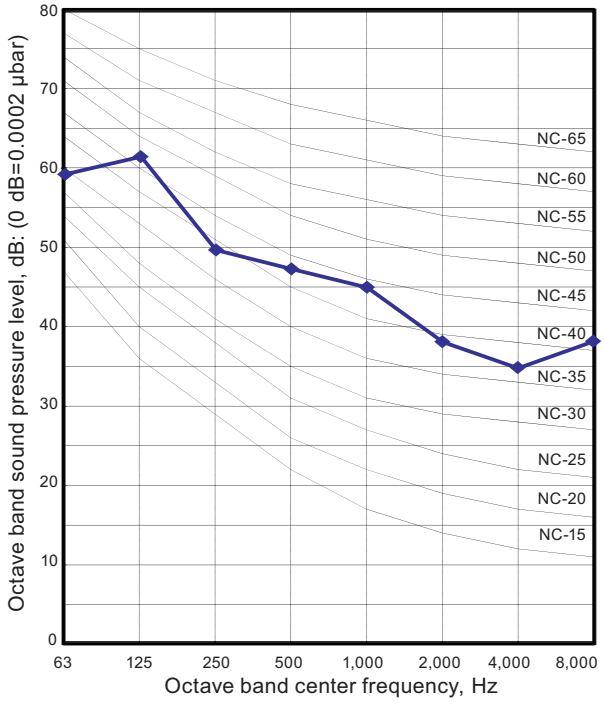


● Heating

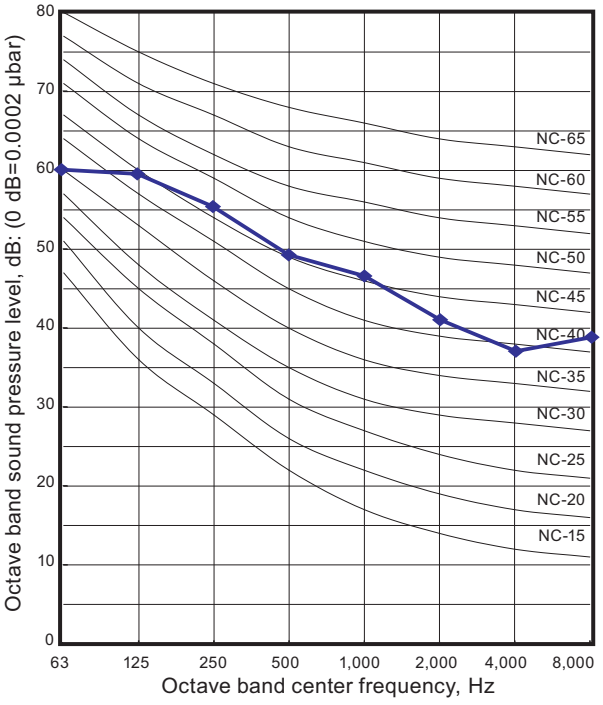


■ Model: AOYG18KBTA2

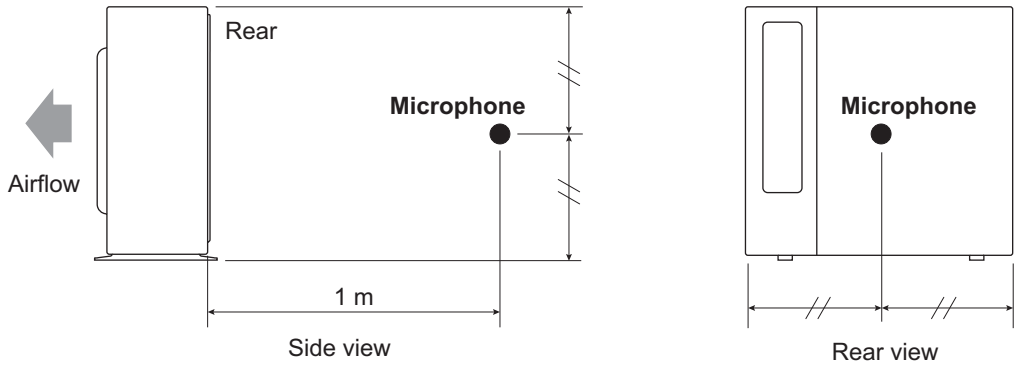
● Cooling



● Heating



10-2. Sound level check point



NOTE: Detailed shape of the actual outdoor unit might be slightly different from the one illustrated above.

OUTDOOR UNIT
AOYG14-18KBTA2

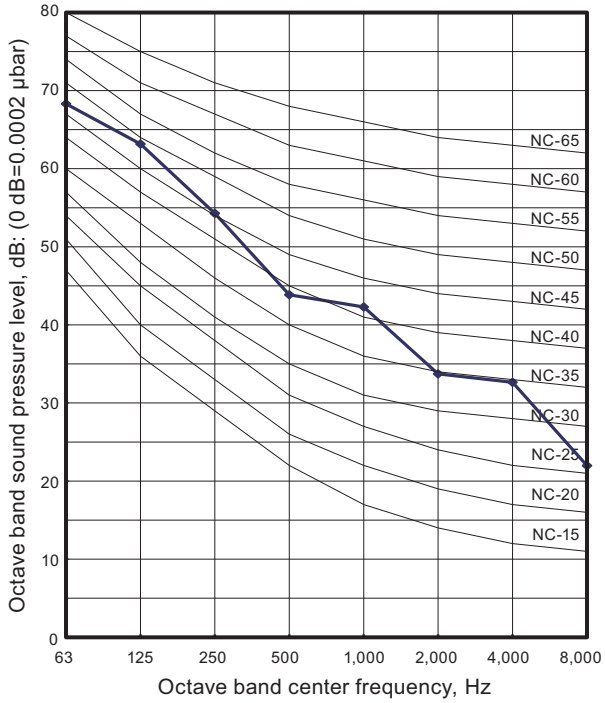
OUTDOOR UNIT
AOYG18, 24KMTA

9. Operation noise (sound pressure)

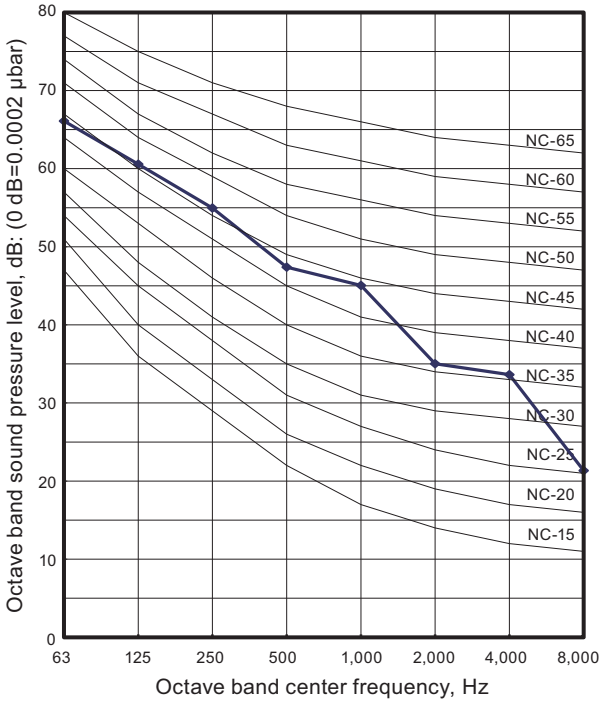
9-1. Noise level curve

■ Model: AOYG18KMTA

● Cooling

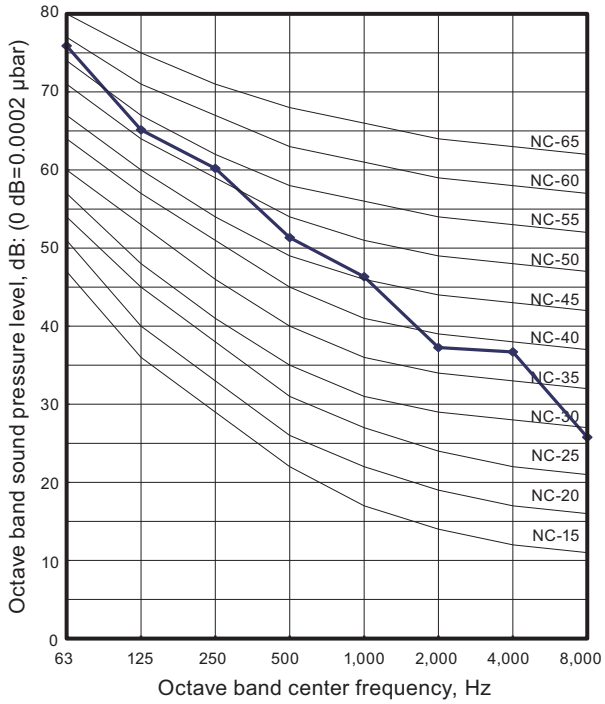


● Heating

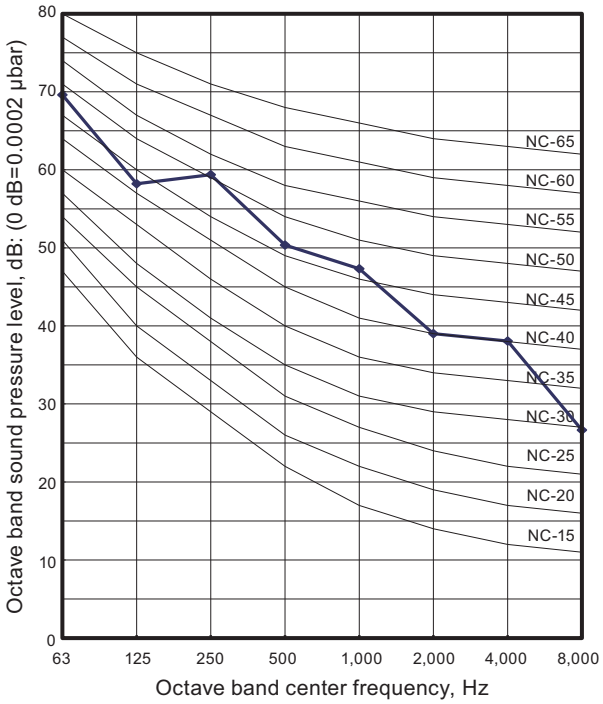


■ Model: AOYG24KMTA

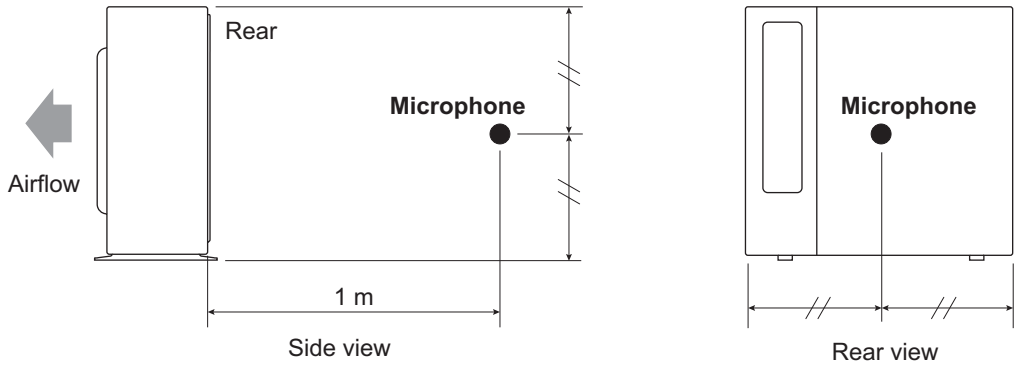
● Cooling



● Heating



9-2. Sound level check point



NOTE: Detailed shape of the actual outdoor unit might be slightly different from the one illustrated above.

Plant Noise Assessment

RBA ACOUSTICS

FLAT 17, 55-59 SAFFRON HILL, LONDON, EC1N 8QX

Plant Noise Assessment

Reference: 13293.RP01.PNA.0
Prepared: 30 January 2024
Revision Number: 0

Ms Elena Arkhangelskaya
Flat 17
55-59 Saffron Hill
London
EC1N 8QX

Plant Noise Assessment

FLAT 17, 55-59 SAFFRON HILL, LONDON, EC1N 8QX

Reference: 13293.RP01.PNA.0
Prepared: 30 January 2024

Revision	Comment	Date	Prepared By	Approved By
0	First issue of report	30 January 2024	Sameer Verma	Martin Raisborough

Terms of contract:

RBA Acoustics Ltd have prepared this report in accordance with our Scope of Work 13293.SW01.0 dated 06 June 2023. RBA Acoustics Ltd shall not be responsible for any use of the report or its contents for any purpose other than that for which it was provided. Should the Client require the distribution of the report to other parties for information, the full report should be copied. No professional liability or warranty shall be extended to other parties by RBA Acoustics Ltd without written agreement from RBA Acoustics Ltd.

The recommendations within this report relate to acoustics performance only and will need to be integrated within the overall design by the lead designer to incorporate all other design disciplines such as fire, structural integrity, setting-out, etc. Similarly, any sketches appended to this report illustrate acoustic principles only and will need to be developed into full working drawings by the lead designer to incorporate all other design disciplines.

RBA ACOUSTICS

LONDON
44 Borough Road
London SE1 0AJ
T. +44 (0) 20 7620 1950

MANCHESTER
Bloc, 17 Marble Street
Manchester, M2 3AW
T. +44 (0) 161 661 4504

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4. ENVIRONMENTAL NOISE SURVEY 2

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6. CONCLUSION 5

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APPENDIX B – INSTRUMENTATION

APPENDIX C – GRAPHS AND SITE PLANS

1. INTRODUCTION

A number of items of condenser plant have been installed Flat 17, 55-59 Saffron Hill, London, EC1N 8QX. A planning application is to be made to the London Borough of Camden (LBoC) for the installed units. As part of this application, consideration is required to be given to atmospheric noise emissions from the installed equipment at the nearest noise-sensitive receptors.

RBA Acoustics has been commissioned to undertake measurements of the prevailing noise conditions at the site & provide an assessment of the atmospheric noise emission limits in accordance with LBoC's requirements.

A summary of acoustic terminology is included in Appendix A.

2. SITE DESCRIPTION

The site and nearest noise-sensitive receptors are shown in the site plan in Figure C1 and Figure C2 (Appendix C).

2.1 Site Location

Flat 17 is located on the sixth floor of 55-59 Saffron Hill, London, a residential apartment block. It is surrounded by a mix of commercial and residential premises, with offices towards the west and the Ziggurat Building, another residential apartment block, towards the north.

Saffron Hill and Saffron Street are roads within the immediate vicinity of the site and generally see high footfall and steady vehicle movements throughout the day. The general noise climate is made up of road traffic, pedestrian and typical anonymous urban noise.

The plant, 2No. condenser units, have been installed on the balcony of Flat 17. Both units are placed at the north of the property, facing towards the Ziggurat Building.

2.2 Location of the Nearest Noise-Sensitive Receptors

The nearest noise sensitive receptors are understood to be as follows:

- Receptor 1 - The nearby residential apartment located at the Ziggurat Building opposite the site, on a similar 6th floor level,
- Receptor 2 – The apartments immediately above and immediately below Flat 17.

3. CRITERIA

The requirements of LBoC's Environmental Health Department regarding new building services plant are understood to be as follows.

"A relevant standard or guidance document should be referenced when determining values for NOEL, LOAEL and SOAEL for non-anonymous noise. Where appropriate and within the scope of the document it is expected that British Standard 4142:2014 'Methods for rating and assessing industrial and commercial sound' (BS 4142) will be used. For such cases a 'Rating Level' of 10 dB below background (15dB if tonal components are present) should be considered as the design criterion)."

Noise Policy Statement for England (NPSE) defines NOEL, LOAEL and SOAEL as follows:

- NOEL – No Observed Effect Level. The level below which no health effect or detrimental impact on the quality of life is observed.
- LOAEL – Lowest Observed Adverse Effect Level. The level at which adverse effects on health and quality of life can be detected
- SOAEL – Significant Observed Adverse Effect Level. The level above which significant adverse effects on health and quality of life occur.

4. ENVIRONMENTAL NOISE SURVEY

4.1 Survey Methodology

Monitoring of the prevailing background noise was undertaken over the following period:

09:15 Monday 15 January to 09:00 Tuesday 16 January 2024.

As the survey was unattended it is not possible to comment with certainty regarding meteorological conditions throughout the entire survey period. However, based on observations during the site visits and weather reports for the area, conditions were generally considered suitable for obtaining representative noise measurements, being predominantly dry with little wind.

4.2 Measurement Location

To determine the existing noise climate around the site measurements were undertaken at the following location:

Measurement Position 1 – Flat 17 Balcony

A microphone was set on an extension pole and attached to the balcony railing of flat 17. The microphone was positioned approximately 2m above the balcony floor, and at least 1m from any reflective surfaces. The noise climate at this position is the same as that experienced in the surrounding area but has been chosen specifically to be representative of the noise climate at the nearby noise sensitive properties.

Note that the installed condenser units were not in operation during the measurement survey.

The measurement position is also illustrated on the site plan attached in Figure C1 and photos in Figure C2 (Appendix C).

4.3 Instrumentation

For information regarding the equipment used for the measurements please refer to Appendix B.

The sound level meter was calibrated both prior to and on completion of the survey with no significant calibration drift observed.

The calibration reference level was 114.0dB. The meter readings of the reference level before and after the measurements were 114.0dB and 114.0dB respectively which were within the calibration tolerance.

4.4 Results

The noise levels measured are shown as time-histories on the attached Graphs 1-3 (Appendix C).

The lowest $L_{A90,\,15\,minute}$ and the period averaged L_{Aeq} noise levels measured are summarised in Table 1.

Table 1 – Measured Sound Levels

Measurement Period	Position 1 – Flat 17 Balcony	
	Lowest $L_{A90,15\,minute}$ (dB)	L_{Aeq} (dB)
Daytime (07:00 – 23:00)	47	57
Night-time (23:00 – 07:00)	44	52

5. BS 4142 ASSESSMENT

This assessment has been based on the information provided to RBA Acoustics by the client and is described in the following sections.

5.1 Proposed Plant Limitations

The requirements of LBoC's Environmental Health Department regarding new building services plant are described in Section 3.

In line with these requirements, and considering the measured background sound levels with the plant inoperative, we propose that noise emissions from items of mechanical services do not exceed the following levels when assessed at the nearest noise sensitive location:

- Daytime (07:00 to 23:00) 37 dBA
- Night-time (23:00 to 07:00) 34 dBA

In line with BS 4142:2014, should the proposed plant be identified as having intermittent or tonal characteristics, a further penalty should be subtracted from any of the above proposed noise emission limits.

It should be noted that the above requirements are to be applied at the nearest residential adjacencies and alternative criteria should be incorporated if there are also commercial properties affected by the proposed plant installations.

5.2 Plant Items

The following plant have been installed:

Table 2 –Plant Types

Ref.	Manufacturer/Model/Duty	Plant Type
CU1	Fujitsu AOYG18KBTA2	Condenser Unit
CU2	Fujitsu AOYG24KMTA	Condenser Unit

5.3 Plant Locations

Both items of plant have been placed on the north facing portion of the balcony of Flat 17, 55-59 Saffron Hill. The equipment positions are indicated on the site plan in Figure C1 and Figure C1 in Appendix C.

5.4 Plant Noise Levels

Information regarding the noise levels of the proposed plant has been provided by the manufacturer of the units. The associated plant noise levels are detailed as follows:

Table 3 – Plant Noise Levels

Unit	Parameter	Sound Level (dB) at Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
CU1 (53dBA)	L_p at 1m	60	60	55	50	46	41	37	40
CU2 (54dBA)	L_p at 1m	70	48	60	50	47	39	38	26

Review of the octave band data provides no indication of any tonal characteristics associated with the proposed plant.

The units are fitted with inverter drivers so there is a smooth and gradual ramp up and down of fan speeds. The noise spectrum shape is also broadband in nature. As such, it is not considered that there are any attention-grabbing noise characteristics associated with the operation of these units such that a rating correction would need to be applied in accordance with BS 4142 methodology.

5.5 Calculation of Noise Levels at Nearest Noise-Sensitive Receptors

BS 4142:2014+A1:2019 states:

> *Calculations are often more reliable than a single short-term measurement when long-term averages are to be determined and in other cases where it is impossible to carry out measurements because of high residual sound levels. In case of the latter, it is sometimes convenient to carry out the measurements closer to the source and then use a calculation method to estimate the specific sound level at the assessment location(s).*

Thus, calculations using the manufacturer's noise data provided will be used to determine the specific and rating sound levels and assessed against the measured background sound levels.
Our calculation method for predicting noise levels from the proposed plant at the nearest noise-sensitive receptors, based on the information above, is summarised below.

- Source Term SPL / SWL
- Distance Attenuation
- Directivity
- Screening

It is assumed that the units will operate at all hours. Only the night-time criteria has been considered in our assessment as the plant noise emission limit is lower during this period. Meeting the night-time criteria will mean the daytime criteria will also be met.

The results of the calculations indicate the following rating sound levels at the nearest affected residential properties:

Table 4 – Predicted Rating Sound Levels

Operating Period	Noise Level (dB) at Receptor 1 – Ziggurat Building Apartment Window		Noise Level (dB) at Receptor 2 – Apartment Window Above/Below Flat 17 Balcony	
	Prediction	Criterion	Prediction	Criterion
Night-time (23:00 – 07:00)	32	34	34	34

Noise from the installed plant is not in exceedance of the proposed limits and Local Authority criteria and should, therefore, be considered appropriate.

As such, no mitigation measures would be required to be included in the design and installation.

5.6 Impact on Nearest Noise-Sensitive Receptors

The impact on the nearest noise sensitive receptors has also been calculated by comparing the calculated rating sound level (unmitigated) with the background sound level in accordance with BS 4142:2014+A1:2019 and is summarised in Table 5:

Table 5 – Predicted Impact level at Nearest Noise-Sensitive Receptors

Receptor	Time Period	Excess of rating level over plant noise emission limit (dB)	NPSE Impact Level
Receptor 1 – Ziggurat Building Apartment Window	Daytime (07:00 – 23:00)	– 5	NOEL
	Night-time (23:00 – 07:00)	– 2	NOEL
Receptor 2 – Apartment Window Above Flat 17 Balcony	Daytime (07:00 – 23:00)	– 3	NOEL
	Night-time (23:00 – 07:00)	– 0	NOEL

6. CONCLUSION

RBA Acoustics has been commissioned to undertake a noise impact assessment in relation to a number of installed condenser units on the balcony of Flat 17, 55-59 Saffron Hill, London, EC1N 8QX.

Monitoring of the prevailing background noise level at the site, with the condensers inoperative, was undertaken between Monday 15 and Tuesday 16 January 2024. The background sound levels have been used as a basis for the setting of noise emission limits for the plant based on the requirements of the London Borough of Camden.

Based on the two installed condenser plant items, a noise impact assessment upon the nearby noise sensitive receptors have been undertaken in accordance with BS 4142 methodology. The results of our assessments indicate that noise from the installed plant items is not expected to cause an observable adverse effect on the occupants of the nearby noise sensitive properties, and is in accordance with the adopted plant noise emission limits.

Appendix A – Acoustic Terminology

A-weighting (e.g. dB(A))	A correction applied across the frequency bands to take into account the response of the human ear, and therefore considered to be more representative of the sound levels people hear.
DeciBel (dB)	Unit used for many different acoustic parameters. It is the logarithmic ratio of the level being assessed to a standard reference level.
L_{eq}	The level of a notional steady sound which, over a stated period of time, T, would have the same acoustic energy as the fluctuating noise measured over that period. Typically used to represent the average or ambient noise level.
$L_{Aeq,T}$	The A-weighted level of a notional steady sound which, over a stated period of time, T, would have the same acoustic energy as the fluctuating noise measured over that period. Typically used to represent the average or ambient noise level.
L_{An} (e.g. L_{A10}, L_{A90})	The sound level exceeded for n% of the time. E.g. L_{A10} is the A-weighted level exceeded for 10% of the time and as such can be used to represent a typical maximum level. Similarly, L_{A90} is the level exceeded for 90% of the measurement period, and is often used to describe the underlying background noise.
NR	Noise Rating – A single figure term to describe a measured noise level which considers the frequency content of the noise, generally used for internal noise level measurements (particularly mechanical services plant).

Appendix B – Instrumentation

The following equipment was used for the measurements.

Table B1– Equipment Calibration Details

Manufacturer	Model Type	Serial No.	Calibration	
			Certificate No.	Valid Until
Norsonic Type 1 Sound Level Meter	Nor140	1403226	U42991	18 January 2025
Norsonic Pre Amplifier	1209A	12066		
Norsonic ½“ Microphone	1225	168180	42990	18 January 2025
Norsonic Sound Calibrator	1251	31988	U42989	18 January 2025

Appendix C – Graphs and Site Plans

55-59 Saffron Hill

L_{Aeq} Time History

Monday 15th January 2024 to Tuesday 16th January 2023

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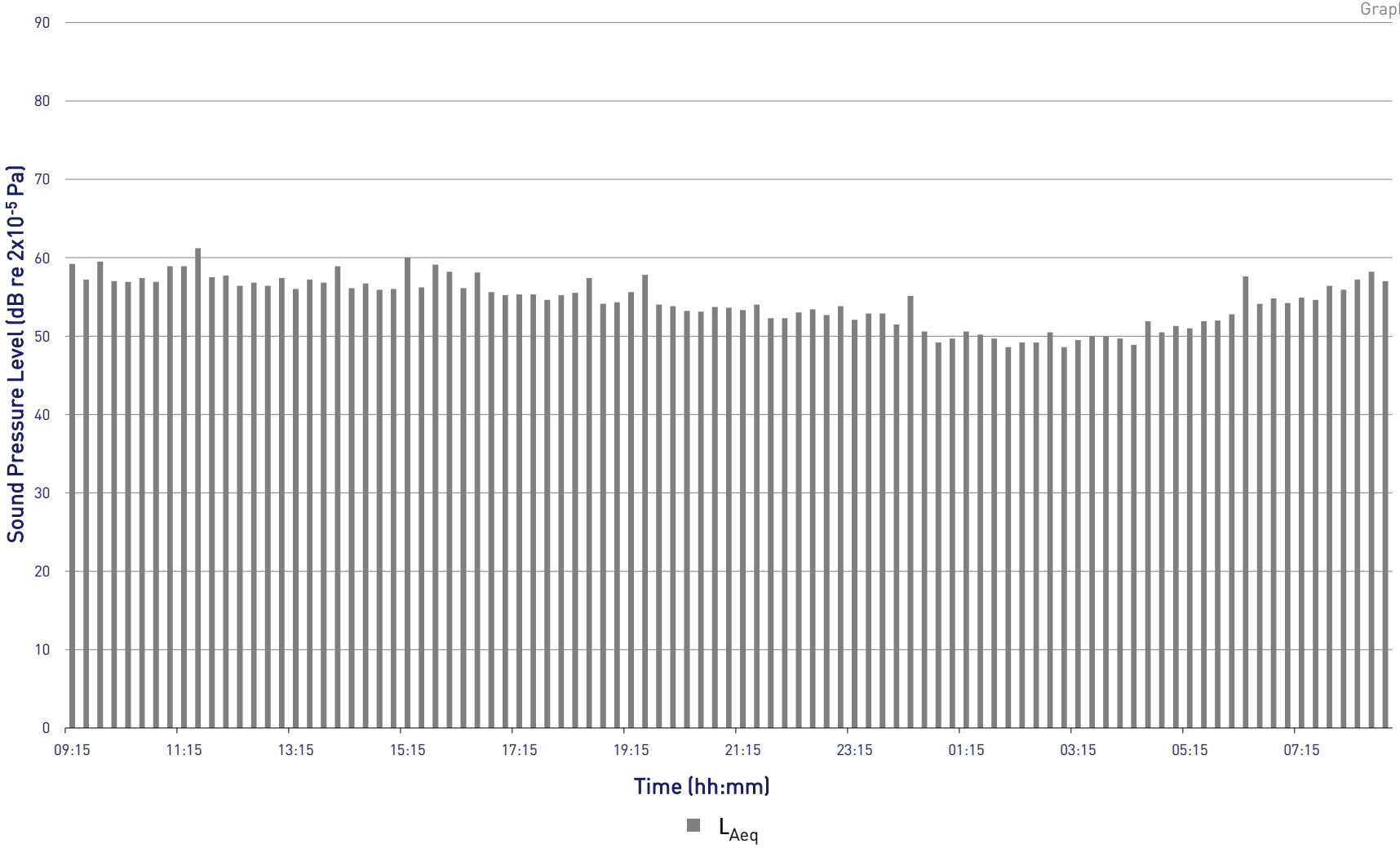
Graph 1



55-59 Saffron Hill

$L_{Amax,f}$ and L_{A90} Time History

Monday 15th January 2024 to Tuesday 16th January 2023

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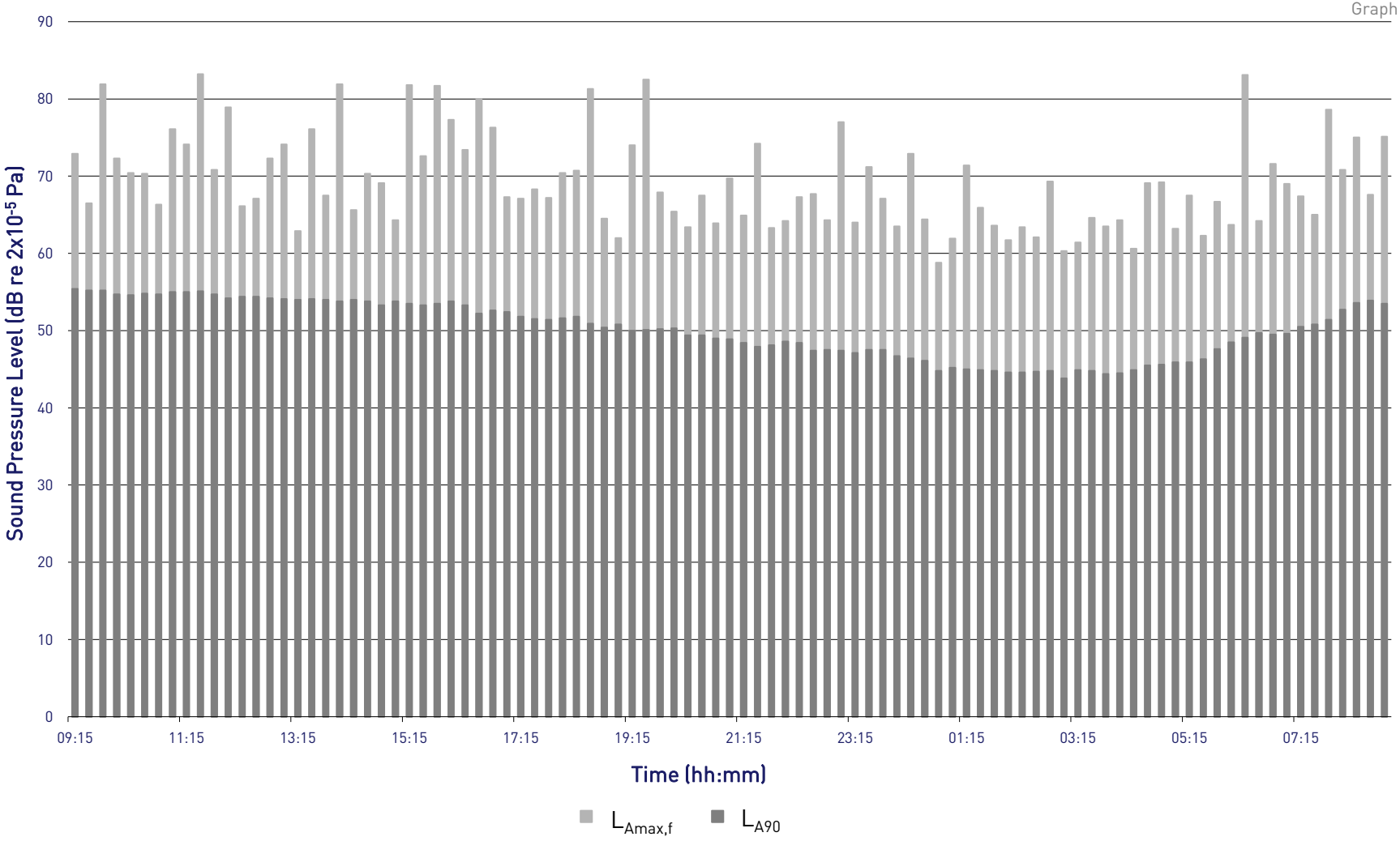
Graph 2



55-59 Saffron Hill

$L_{A90,15\ minutes}$ Histogram

Monday 15th January 2024 to Tuesday 16th January 2023

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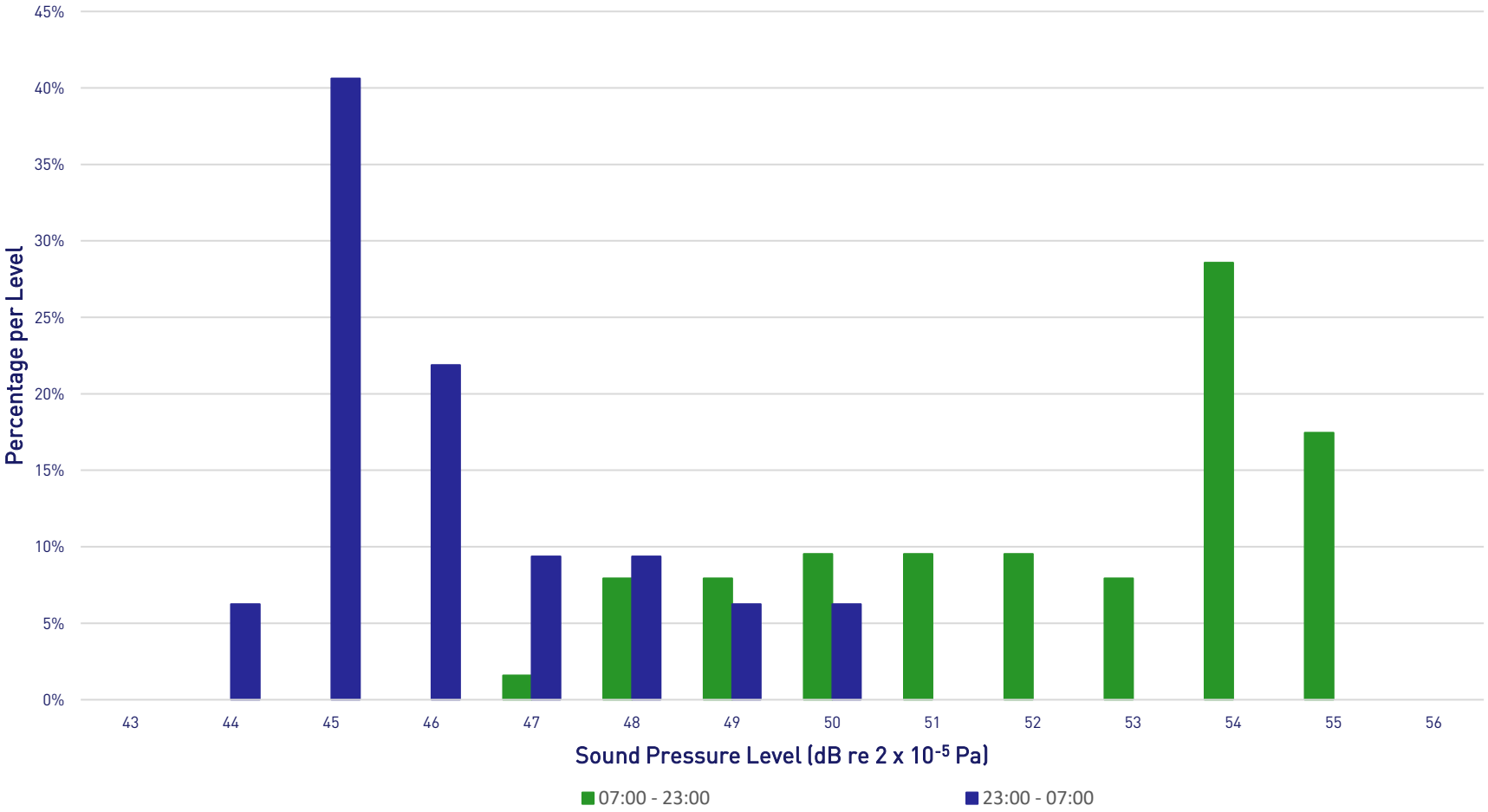
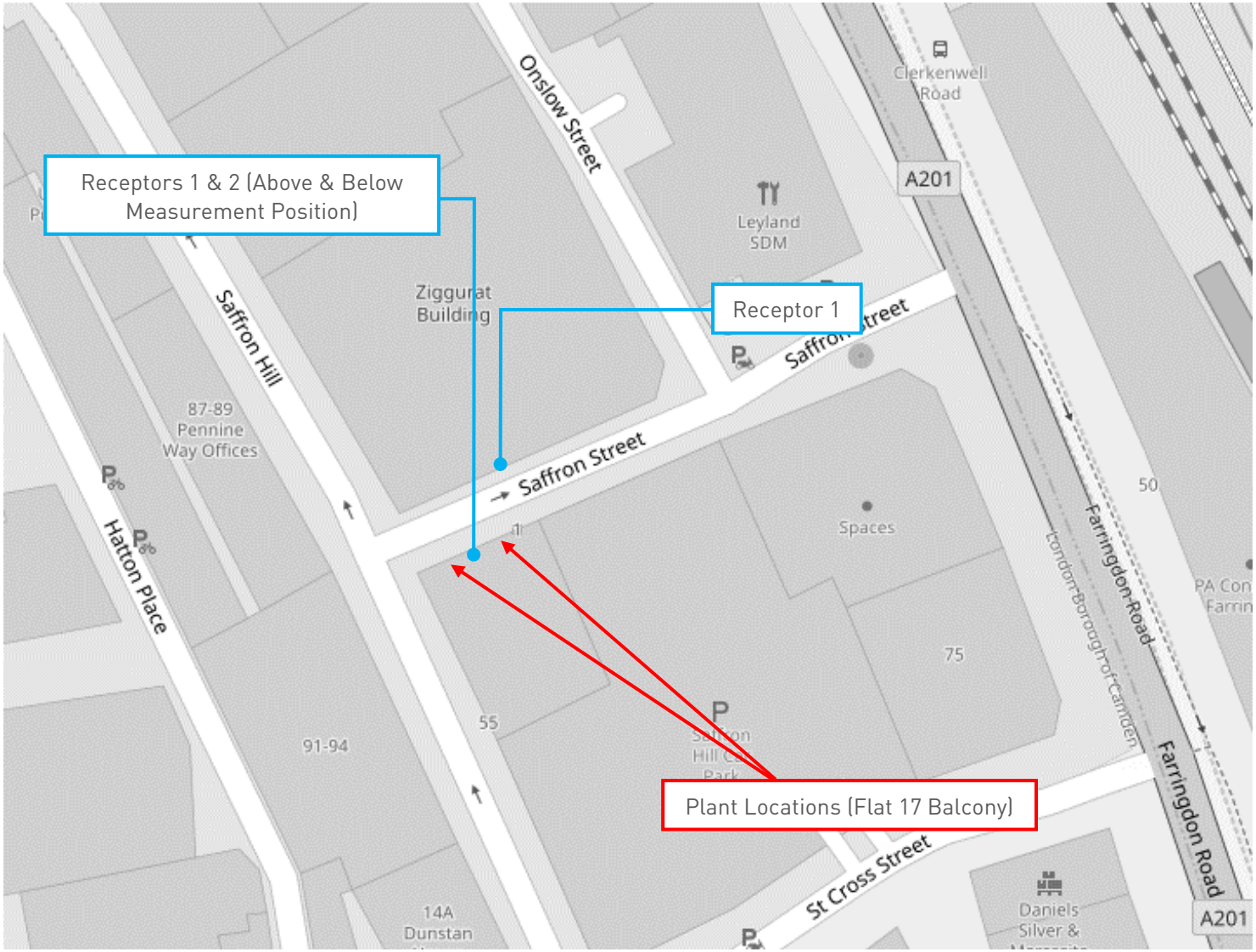
Graph 3





Flat 17, 55-59 Saffron Hill, London, EC1N 8QX

Approximate Locations of Site, Plant & Nearest Noise-Sensitive Receptors

Project 13293

Figure C1

30 January 2024

Not to Scale

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Flat 17, 55-59 Saffron Hill, London, EC1N 8QX

Photos of Plant & Nearest Noise-Sensitive Receptors

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Figure C2

30 January 2024

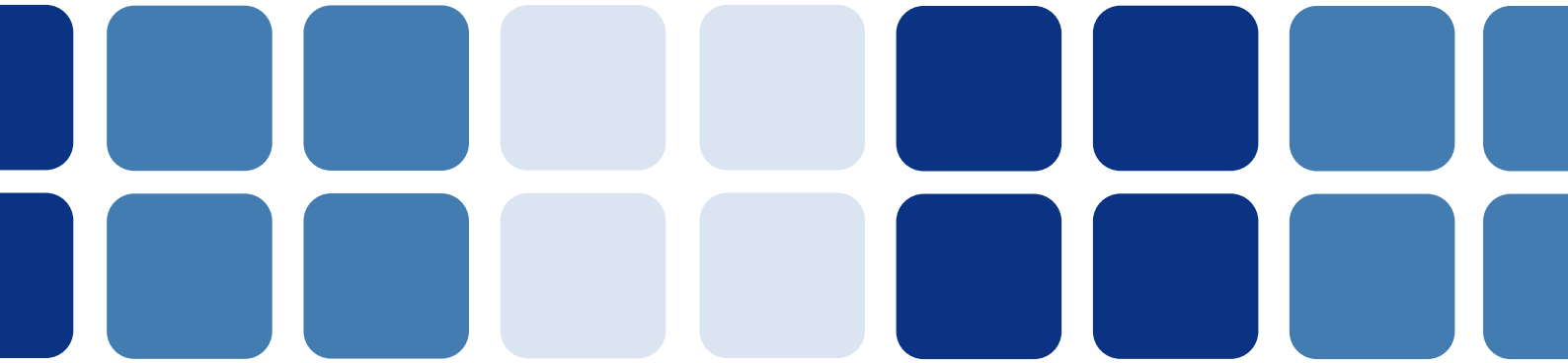
Not to Scale

RBA ACOUSTICS

RBA ACOUSTICS
W. www.rba-acoustics.co.uk
E. info@rba-acoustics.co.uk

London:
44 Borough Road
London SE1 0AJ
T. +44 (0) 20 7620 1950

Manchester:
Bloc, 17 Marble Street
Manchester M2 3AW
T. +44 (0) 161 661 4504



Energy Statement

L2 ENERGY Consulting
Established 2008

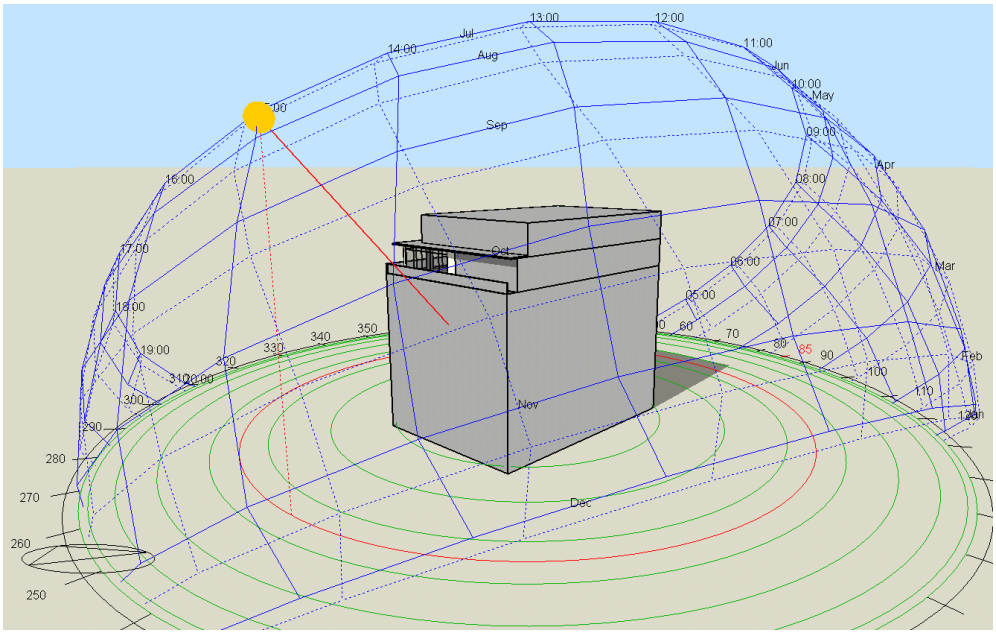
TM59: Overheating Risk Assessment
Revision 1

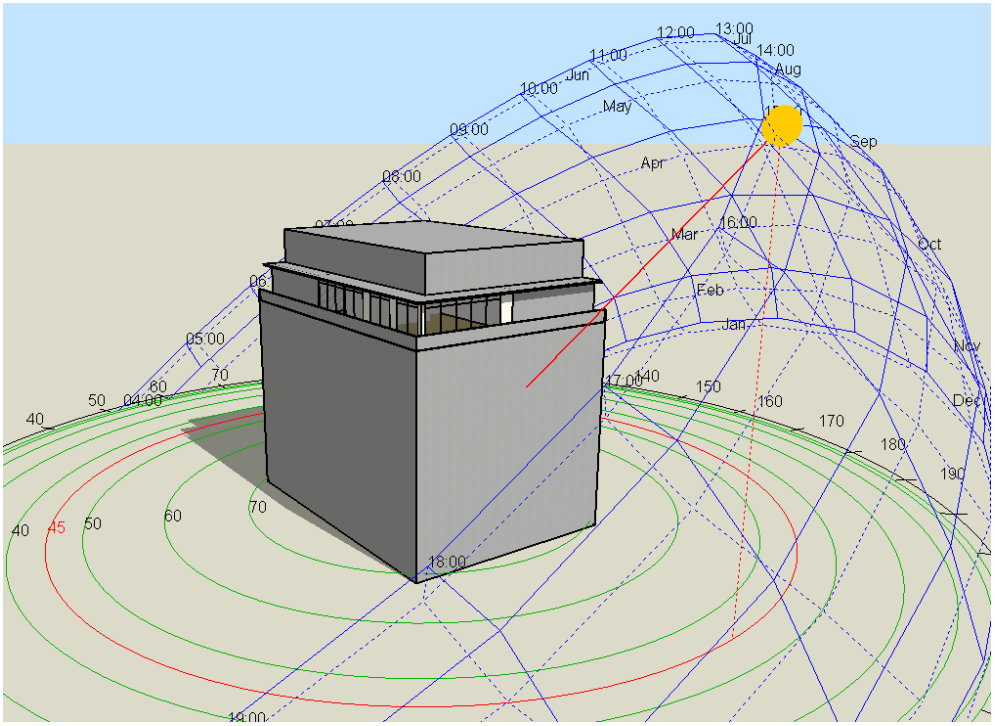
For

Flat 17, 6th Floor
55 Saffron Hill
London
EC1N 8QX

Date: 22 January 2024

EXISTING DWELLING
FLAT 17, 6th FLOOR, 55 SAFFRON HILL





Modelled in DesignBuilder 7.2.0.032 Utilizing Energyplus Version 9.4.0.002 in accordance with CIBSE AM11 using guidance outlined in CIBSE TM59.

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EXECUTIVE SUMMARY

This report seeks to demonstrate whether the existing dwelling, Flat 17, 6th Floor, 55 Saffron Hill, London meets the requirements of TM59: Design methodology for the assessment of overheating risk in homes. If the requirements of TM59 are shown not to be met, installing Air Conditioning is an option which may be sought providing the requirements of the Cooling Hierarchy within the Camden Local Plan are investigated and other methods of achieving acceptable comfort levels cannot be introduced as an alternative.

Compliance Criteria

Homes that are predominantly naturally ventilated, including homes that have mechanical ventilation with heat recovery (mvhr), with good opportunities for natural ventilation in the summer should assess overheating using the adaptive method based on CIBSE TM52 (2013).

In order to allow the occupants to 'adapt', each habitable room needs operable windows with a minimum free area that satisfies the purge ventilation criteria set in Part F of the Building Regulations for England (NBS, 2010), i.e. the window opening area should be at least 1/20th of the floor area of the room (different conditions exist for windows with restricted openings, and the same requirement applies for external doors). Control of overheating may require accessible, secure, quiet ventilation with a significant openable area.

Homes that are predominantly mechanically ventilated because they have either no opportunity or extremely limited opportunities for opening windows (e.g. due to noise levels or air quality) should be assessed for overheating using the fixed temperature method based on CIBSE Guide A (2015a).

Criteria for homes predominantly naturally ventilated

Compliance is based on passing *both* of the following two criteria:

(*a*) *For living rooms, kitchens and bedrooms*: the number of hours during which D*T* 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. (CIBSE TM52 Criterion 1: *Hours of exceedance*).

(*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 annual hours. (*Note*: 1% of the annual hours between 22:00 and 07:00 for bedrooms is 32 hours, so 33 or more hours above 26 °C will be recorded as a fail).

Criteria for homes 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 (CIBSE Guide A (2015a)).

Basis of Methodology for this Assessment

There is good opportunity for natural ventilation in the summer within the property and therefore the adaptive method for homes predominately naturally ventilated is to be used.

Assessments are based upon occupied hours between May and September, this equates to 3,672 hours per year for bedrooms and 1,989 hours per year for Living rooms.

Results Overview

The results obtained from the thermal model demonstrate that all bedrooms and the living room of the property do not pass the requirements of TM59, indicating significant overheating will occur.

CALCULATION PARAMETERS

The building was redeveloped in circa 2000/2001 when three addition floors were added to a conversion from offices to residential flats, Flat 17 was within the new portion and therefore u-values have been taken from ADL1 1996 of Building Regulations

U-Values

External Walls	0.45 W/m²K
Roof	0.25 W/m²K
Ground Floor	N/A
Windows	2.80 W/m²K

Glazing

Existing windows and glazed doors with an anticipated g-value of 0.70 and light transmission of 0.80 has been allowed for.

Room and Glazing Sizes

A survey was undertaken taking full dimensions, window and opening sizes and room layouts.

Thermal Mass

Medium-weight construction has been allowed to all elements, with the exception of lightweight internal partition walls.

Ventilation Strategy

Openable windows available to all occupied areas via sliding doors and windows above. Free Areas calculated accordingly. Sliding doors have been modelled as closed from 11pm with windows above being opened throughout the day and night.

In accordance with TM59 windows to be open when the internal dry bulb temperature exceeds 22°C and the room is occupied.

Lighting

In accordance with TM59, lighting gains are set at 2 W/m² and on between 6pm and 11pm.

Air Permeability

Air permeability set at 15.0 m³/(h.m²) at 50 Pa.

Internal Gains

In accordance with TM59

Room Ref:	Occupancy Gains	Lighting Gains W/m²	Equipment Gains W/m²
Bedrooms	2*	2.0	80W Peak Load*
Kitchen Living	3*	2.0	450W Peak Load*

*Adjusted in accordance with TM59 for differing time periods of the day.

Occupied Times

In accordance with TM59

Room Ref	Occupancy
Single Bedrooms	1 person at 70% gains from 11pm to 8am 1 person at full gains from 8am to 11pm
Double Bedrooms	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 gain in the bedroom from 9am to 10pm
Living	4 people at 5% gains from 9 am to 10 pm; room is unoccupied for the rest of the day
Kitchen	4 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day

Weather File

London Central DSY1 2020s, high emissions, 50% percentile scenario in accordance with TM59

OVERHEATING

Compliance is based on passing *both* of the following two criteria:

(*a*) *For living rooms, kitchens and bedrooms*: the number of hours during which D*T* 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. (CIBSE TM52 Criterion 1: *Hours of exceedance*).

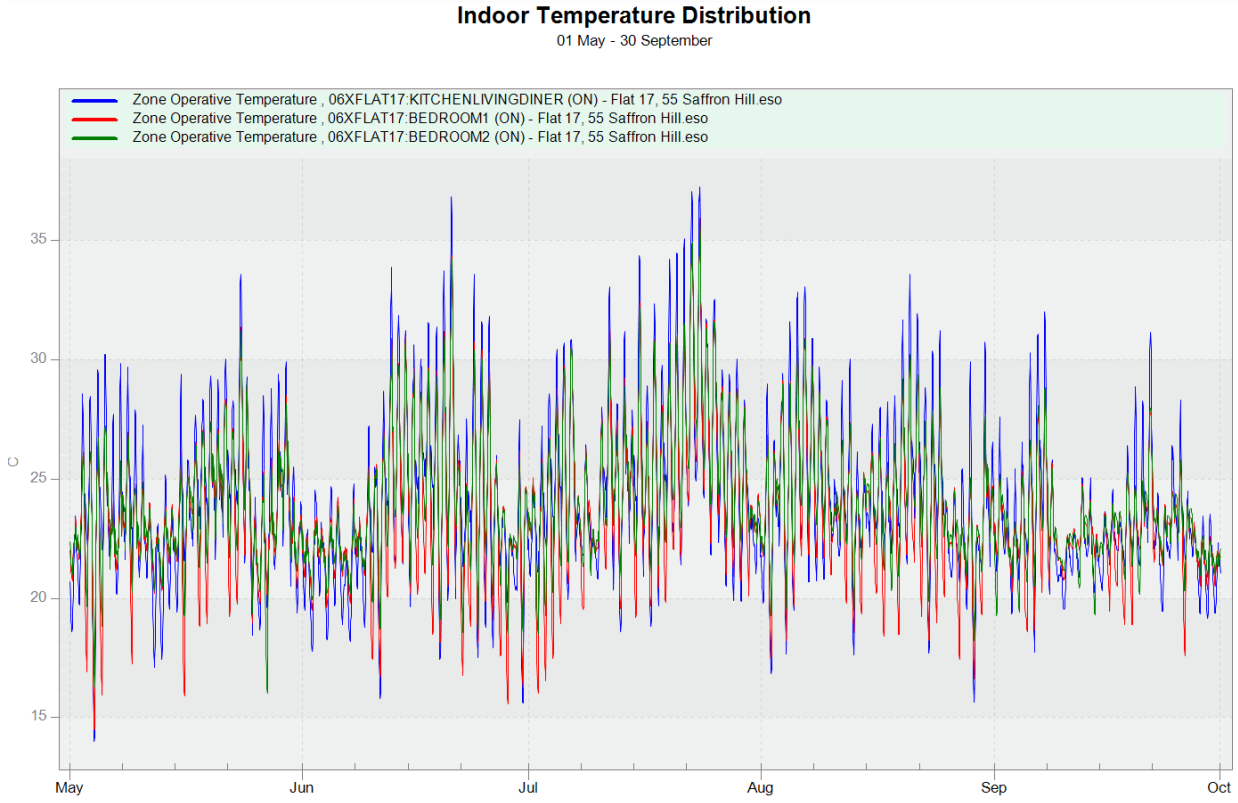
(*b*) *For bedrooms only*: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26 °C for more than 1% of annual hours. (*Note*: 1% of the annual hours between 22:00 and 07:00 for bedrooms is 32 hours, so 33 or more hours above 26 °C will be recorded as a fail).

Results of the above calculations can be viewed below and can be seen that all tested occupied space fails the required benchmark of CIBSE TM59

Results

Dwelling	Level	Zone	Criterion A (%)	Criterion B (hr)	Pass / Fail
Flat 17, 55 Saffron Hill	Sixth Flr	Kitchen - Living Room	16.58	N/A	Fail
	Sixth Flr	Bedroom 1	4.10	68.33	Fail
	Sixth Flr	Bedroom 2	4.02	127.00	Fail

Indoor Temperature Distribution



COOLING HIERARCHY

In accordance with Camden Local Plan air conditioning will only be permitted where dynamic thermal modelling demonstrates there is a clear need for it after all of the preferred measures are incorporated in line with the cooling hierarchy.

The cooling hierarchy includes:

- Minimise internal heat generation through energy efficient design;
- Reduce the amount of heat entering a building in summer through orientation, shading, albedo, fenestration, insulation and green roofs and walls;
- Manage the heat within the building through exposed internal mass and high ceilings;
- Passive ventilation;
- Mechanical ventilation;
- Active cooling.

As this is an existing dwelling many of the above design considerations, applicable to new developments, cannot be incorporated as it forms part of a block of flats. There is little option to add any further thermal mass to the property as this could compromise the structural integrity of the building. The bedrooms and living room could only be improved by changing all of the windows to include solar glazing or by adding window film to reduce solar gains. Passive shading is already included from the full length balcony above and could not be extended further.

The property already benefits from adequate passive ventilation with openable windows being readily available but not providing much in the way of through ventilation as windows are not directly opposite one another.

Mechanical ventilation would be difficult to achieve as windows are full height and ceiling levels are insufficient to install ducting without leaving it exposed which would significantly impact on headroom and the internal look of the property, however for the purposes of the exercise it is worth investigating the impact of increasing the air change rate through mechanical ventilation.

The options available to try and meet the requirements of TM59 are therefore as below.

1. Reducing solar gains by introducing window film, film can reduce solar gains by around 40%
2. Adding mechanical ventilation

See calculations overleaf

1. Adding Solar Film to Windows

The calculations have been re-run to include solar film to the windows to reduce the solar gains entering the flat by as much as 40% this would be a straightforward installation and felt this may be reasonably cost effective. However, from the results below it can be seen that all of the rooms will still overheat although an improvement has been indicated.

Dwelling	Level	Zone	Criterion A (%)	Criterion B (hr)	Pass / Fail
Flat 17, 55 Saffron Hill	Sixth Flr	Kitchen - Living Room	6.86	N/A	Fail
	Sixth Flr	Bedroom 1	1.29	43.83	Fail
	Sixth Flr	Bedroom 2	1.46	80.83	Fail

2. Adding Mechanical Ventilation at 3 Air Changes per Hour

To gain further improvement in potential comfort levels, mechanical ventilation has been added to the dynamic thermal model at 3 air changes per hour whilst leaving the window film in place. A slight improvement can be seen however the calculations still do not meet the requirements of TM59

Dwelling	Level	Zone	Criterion A (%)	Criterion B (hr)	Pass / Fail
Flat 17, 55 Saffron Hill	Sixth Flr	Kitchen - Living Room	6.4	N/A	Fail
	Sixth Flr	Bedroom 1	1.22	41.67	Fail
	Sixth Flr	Bedroom 2	1.33	68.67	Fail

The results indicate, in order to provide thermal comfort within the property, active cooling would be the only way this can be achieved within the pre-existing building.

REDUCTION IN CO2 EMISSIONS

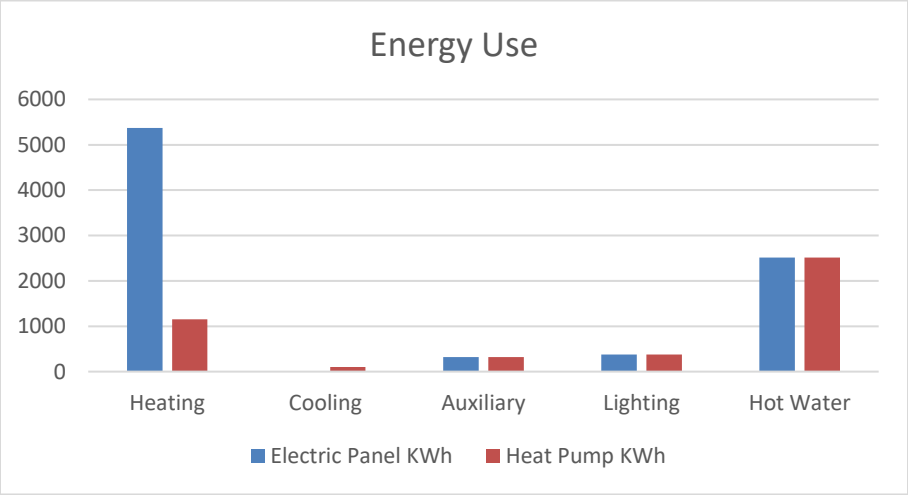
The installation of high efficient heat pumps to provide both active cooling and heating can significantly reduce the carbon footprint of a building that would otherwise be heated by electric panel heaters or electric underfloor heating throughout. There is no Gas connection to this building, however the carbon factor for gas is 0.21 Kg/CO2 per KWh whilst electricity is 0.136 Kg/CO2 per KWh, therefore electric solutions are much less carbon intensive.

The installed units are as follows with corresponding efficiencies

Bedrooms 2no. Fujitsu AOYG18KBTA2 (SCOP 4.7, SEER 8.6, EER 4.03)
Living/Kitchen 1no. Fujitsu ASYG24KMTA (SCOP 4.2, SEER 7.3, EER 3.41)

The table below demonstrates the savings which are made when calculating the energy use using the dynamic thermal modelling software.

	Electric Panel Heating KWh.annum	Heat Pump (Split AC) KWh.annum
Heating	5372	1151
Cooling	0	103
Auxiliary	324	324
Lighting	376	376
Hot Water	2515	2515
Total	8586	4468



This represents a 48% reduction in energy use and equates to a CO2 saving of 560 Kg per annum being emitted into the atmosphere.

CONCLUSION

When following the cooling hierarchy in accordance with the Camden Local Plan, it is demonstrated that active cooling should be allowable within this dwelling as all other options within the hierarchy have been explored and tested within the realms of the existing flat to bring the flat within reasonable comfort levels as set by CIBSE TM59. The dynamic thermal modelling proved that satisfactory comfort levels are not achievable without active cooling.

Furthermore, the installation of high efficiency heat pumps to provide both heating and cooling would saving in the order of 560 Kg of CO_2 being emitted into the atmosphere each year, another valuable statistic in favor of the installation of heat pumps.

COP RATING OF UNITS