Central Somers Town
Plot 5 and Plot 6

Environmental Noise Survey and Plant Noise Impact Assessment Report

30538/PNA1

9 July 2024

For:
Morgan Sindall
10th Floor
1 Eversholt Street
London
NW1 2DN

Hann Tucker Associates
Consultants in Acoustics Noise & Vibration

Head Office: Duke House, 1-2 Duke Street, Woking, Surrey, GU21 5BA (t) +44 (0) 1483 770 595
Manchester Office: First Floor, 346 Deansgate, Manchester, M3 4LY (t) +44 (0) 161 832 7041
(w) hanntucker.co.uk (e) enquiries@hanntucker.co.uk

Hann Tucker Associates

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			Stavros Tagios Consultant MSc	Giovanni De Rienzo Principal Consultant BSc(Hons), MIOA	Firas Farhan Associate MSc
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Contents

Attachments

1.0 Introduction

Hann Tucker Associates Limited (Hann Tucker) has been commissioned by Morgan Sindal to undertake a noise assessment for a site in Central Somers Town, NW1 1HW, London.

The site, which is located on Purchese Street, is being considered for residential development. The development is proposed to be 2No. plots, each being 6No. storeys with inverter plant and lift supply located on the roof.

Baseline noise conditions have been established by means of a detailed noise survey, presented herein.

2.0 Objectives

To inspect the site to familiarise ourselves with its layout and surroundings in order to identify suitable accessible locations for environmental noise measurements.

To establish by means of an unattended survey the existing $L_{Amax,}$ L_{Aeq} and L_{A90} environmental noise levels at 2No. secure and accessible on-site positions, using fully computerised noise monitoring equipment.

The survey will enable noise emission limits from the development to be identified with reference to the requirements of the Local Authority and/or the application of BS 4142: 2014 and to minimise the possibility of noise nuisance to neighbours.

To assess the noise emissions from the proposed plant, based upon data with which we are provided, and comment upon the acceptability.

To advise on noise control measures if required.

3.0 Acoustic Terminology

For an explanation of the acoustic terminology used in this report please refer to Appendix A enclosed.

4.0 Site Description

4.1 Location

The site is located at Somers Town, London, NW1 1HW. The location is shown in the Location Map below.

Location Map, Imagery © 2023, Google, Map data © 2023,

The site falls within the jurisdiction of Royal Borough of Camden.

4.2 Description

The site is bounded by Purchese street to the west and Hampden Close to the north. To the east and south are 3No. storey residential premises. Buildings across the road on Purchese street comprise 3No. storey residential units and a school to the northwest. To the south is Brill Tower, a 22No. Storey residential building.

The approximate site boundaries are marked up in yellow in the Site Plan below.

Site Plan, Imagery © 2023, Google, Map data © 2023,

5.0 Planning Policies, Standards & Guidance

In order to provide a suitable assessment a number of national planning policies have been considered.

All guidance used to form a noise impact assessment is taken from various standards, guidance, and Local Authority requirements as summarised below:

- Local Planning Policy
- British Standard 4142:2014 + A1:2019
- Statutory Noise Nuisance

Detailed information for relevant planning policies and guidance can be found within Appendix B.

6.0 Survey Methodology

The survey was undertaken by Stavros Tagios MSc.

6.1 Procedure

Fully automated environmental noise monitoring was undertaken from approximately 11:00 hours on Thursday 30th March 2023 to 07:00 hours on Monday 4th April, to establish full daytime and night-time noise levels over a typical weekday and weekend period. Measurements were taken continuously of the A-weighted (dBA) L_{90}, L_{eq}, and L_{max} sound pressure levels over discreet 15-minute periods.

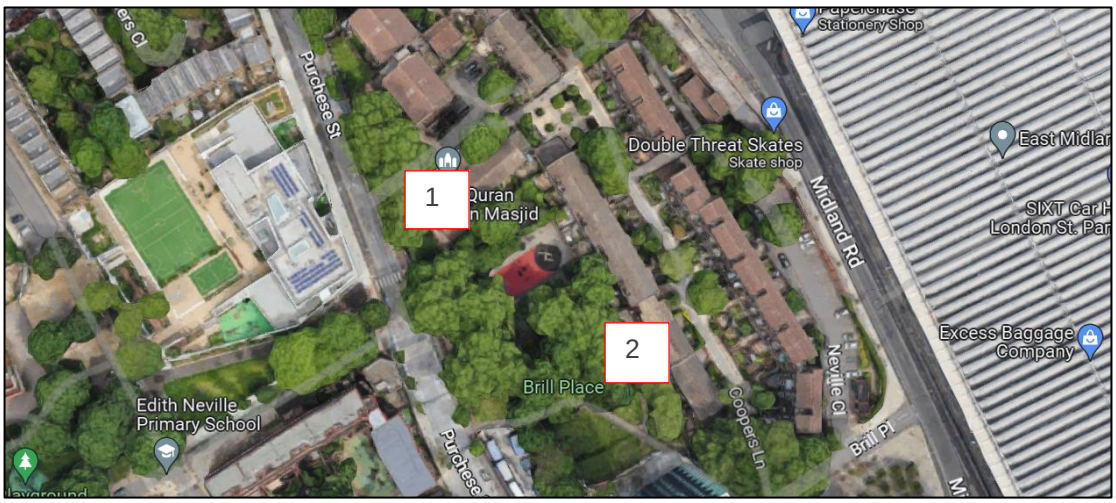
We understand that during the time of the survey, demolition works were being carried out on site. We have not included any data we think might have been affected by those works.

6.2 Measurement Positions

The noise level measurements were undertaken at 2No. positions as described in the table below.

Position	Type	Description
1	Unattended	To the south east corner of the site, attached on a fence at least 3m away from the nearest neighbouring building. Microphone in free-field conditions approx. 3m above ground.
2	Unattended	To the north west corner of the site, attached on a fence overlooking the junction of Purchese Street and Hampden Close. Microphone in free-field conditions approx. 3m above ground.

The positions are shown on the plan below.



Plan Showing Measurement Positions, Imagery © 2023, Google, Map data © 2023,

6.3 Weather Conditions

For the unattended survey between Thursday 30 March 2023 and Monday 3 April 2023, local weather reports indicated rainfall throughout Friday 31 March, with temperatures ranging from 1 °C (night) to 17 °C (day) and wind speeds generally around 4.1 m/s. During our time on site, skies were largely clear with patchy cloud cover, wind conditions were calm and from a southwestern direction and road surfaces were largely dry.

The above are conditions are considered suitable to acquire representative results. The levels measured during periods of rainfall have been excluded from any subsequent assessments, as those periods coincided with demolition works (i.e Friday 31st March).

6.4 Instrumentation

The instrumentation used during the survey is presented in the table below:

Position	Description	Manufacturer	Type	Serial Number	Calibration
1	Type 1 Data Logging Sound Level Meter	Svantek	971	74415	Calibration on 09/08/2022
	Type 1 ½" Condenser Microphone	ACO Pacific	7052E	71786	Calibration on 09/08/2022
	Preamp	Svantek	SV18	75754	Calibration on 09/08/2022
2	Type 1 Data Logging Sound Level Meter	Svantek	971	80232	Calibration on 06/07/2022
	Type 1 ½" Condenser Microphone	ACO Pacific	7052E	67976	Calibration on 06/07/2022
	Preamp	Svantek	SV18	71473	Calibration on 06/07/2022
-	Type 1 Calibrator	Bruel & Kjaer	4230	1511010	Calibration on 26/07/2022

Each sound level meter, including the extension cable, was calibrated prior to and on completion of the surveys. No significant changes were found to have occurred (no more than 0.1 dB).

Each sound level meter was located in an environmental case with the microphone connected to the sound level meter via an extension cable. Each microphone was fitted with a windshield.

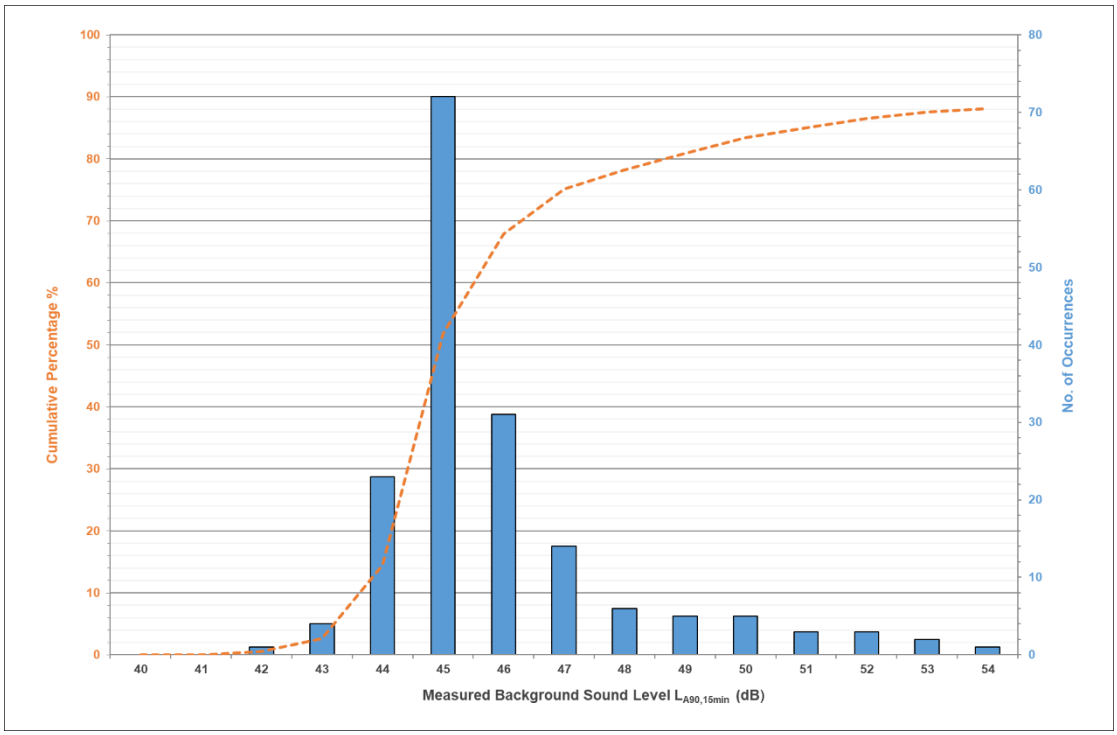
7.0 Results

The results have been plotted on Time History Graphs 30538/TH1 to 30538/TH2 enclosed presenting the 15 minute A-weighted (dBA) L_{90}, L_{eq} and L_{max} levels at each measurement position throughout the duration of the survey.

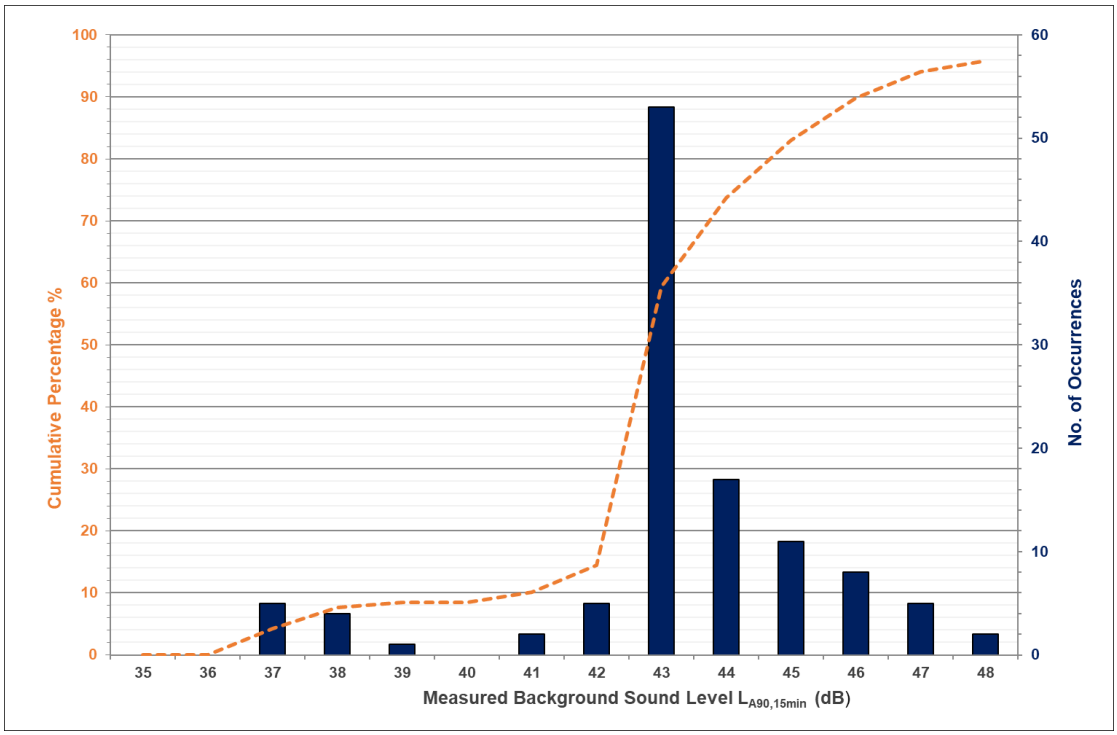
BS 4142 states that “the background sound level must be reliable and suitably represent he particular circumstances and periods of interest. For this purpose, the objective is not simply to ascertain a lowest measured background sound level, but rather to quantify what is typical during particular time periods.” Taking this into account, the following histograms have been created which display the occurrence of each sound level (L_{A90}) for the day and night-time periods.

7.1.1 Position 1

Daytime

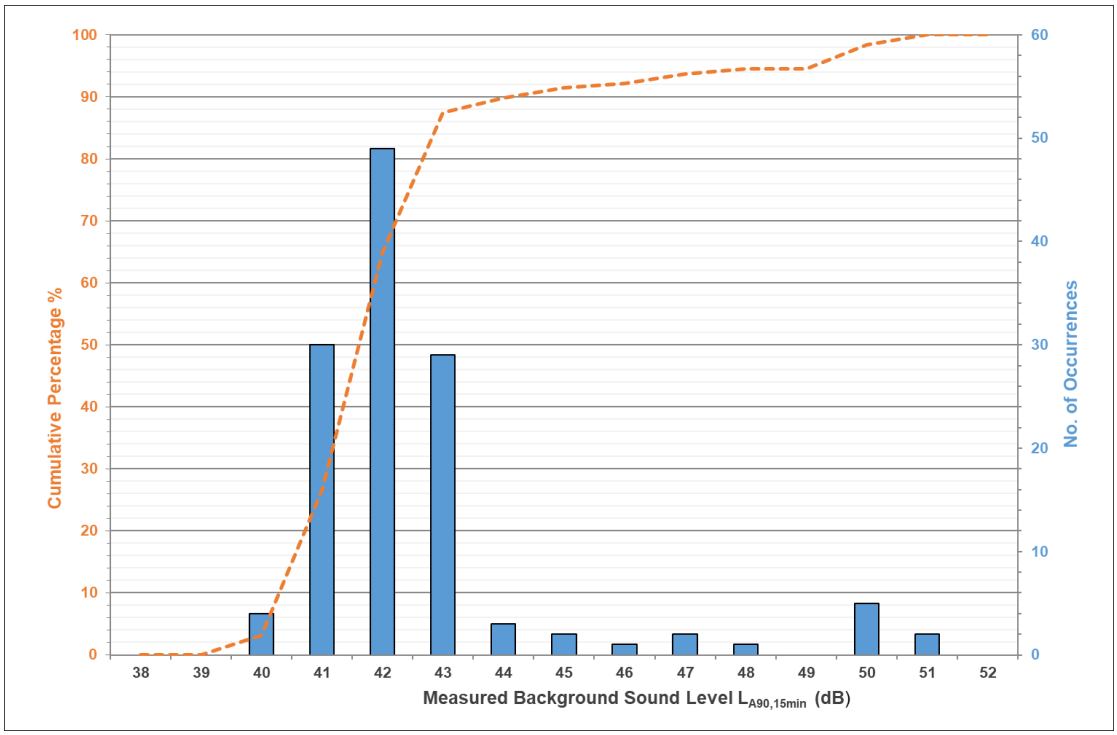


Night-time

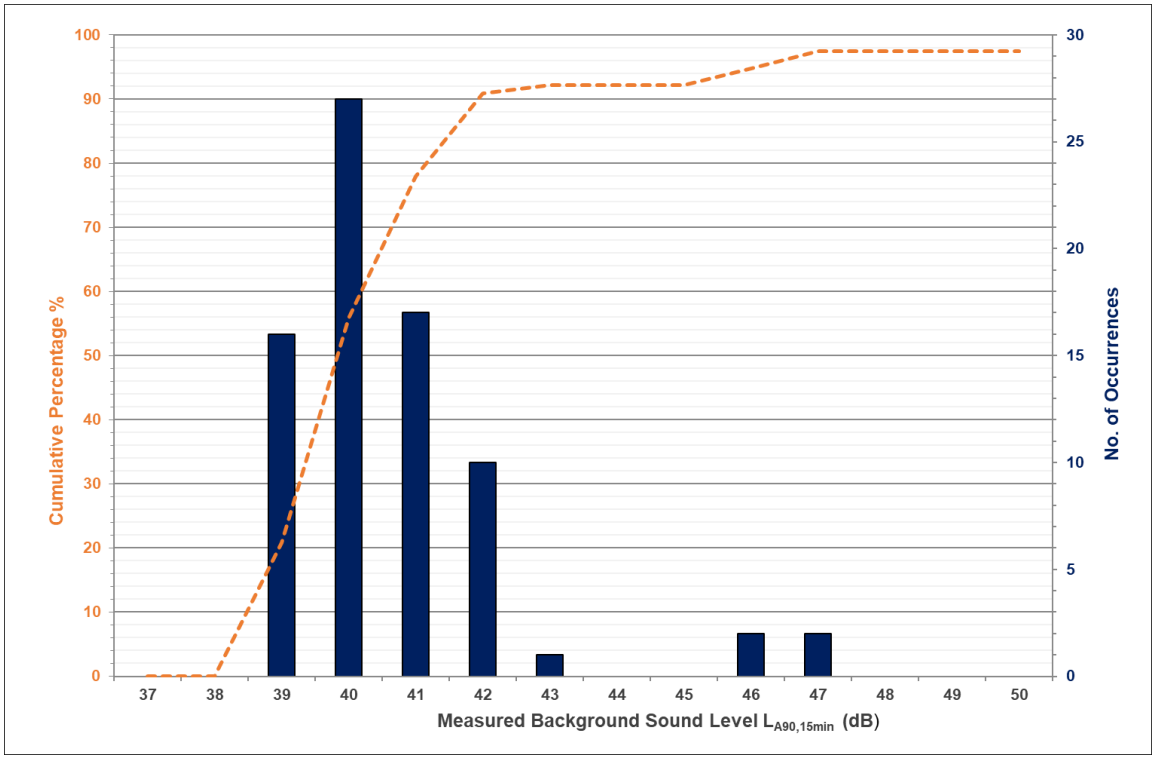


7.1.2 Position 2

Daytime



Night-time



A summary of the results, as used to inform subsequent assessments against current guidelines, is presented in the table below. The L_{A90} values presented below are considered to be the 'representative' background sound levels determined through statistical analysis of the 15-minute readings in line with BS 4142.

Position	Representative Measured $L_{A90(15min)}$ Background Sound Level (dB re 2 x 10^{-5} Pa)	
	Daytime (07:00 – 23:00) Hours	Night-Time (23:00 – 07:00) Hours
1	44	43
2	41	39

The above levels are as measured at the measurement positions and include local reflections

8.0 Discussion of Noise Climate

Due to the nature of the survey, i.e. unattended, it is not possible to accurately describe the dominant noise sources, or specific noise events throughout the entire survey period. However, at the beginning and end of the survey period the noise climate was noted to be dominated by road traffic on Purchese Street. Due to ongoing works there was construction noise during daytime hours but it was temporary and has been omitted from our assessment.

9.0 Operational Noise Impacts

Building services plant external noise emission levels will need to comply with local authority requirements.

The Local Authority requirements are outlined in Appendix B, Section B.3.

On the basis of the Local Authority requirements and the results of the environmental noise survey, we propose that the following plant noise emission criteria be achieved at 1 metre from the nearest noise sensitive residential window.

Position	Noise Emission Limit (dBA)		
	Daytime (07:00 – 23:00 hours)	Night-time (23:00 – 07:00 hours)	24 hours
1	34	33	33
2	31	29	29

The above criteria are to be achieved with all of the proposed plant operating simultaneously.

It should be noted that the above are subject to the final approval of the Local Authority.

For life safety standby plant, only used in emergencies and occasional testing - e.g. smoke extract fans and life safety generators - relaxations of the internal and external criteria are normally acceptable but should comply with local authority and occupational requirements and must not interfere with internal audible emergency alarms.

10.0 Plant Noise Impact Assessment

10.1 Proposed Plant

We understand that the proposed plant is as per the technical submission document titled "TM54008-IMX-XX-XX-TS-E-0041" and dated 20 March 2024 as well as information received via email on 02/07/2024 by I-MEX.

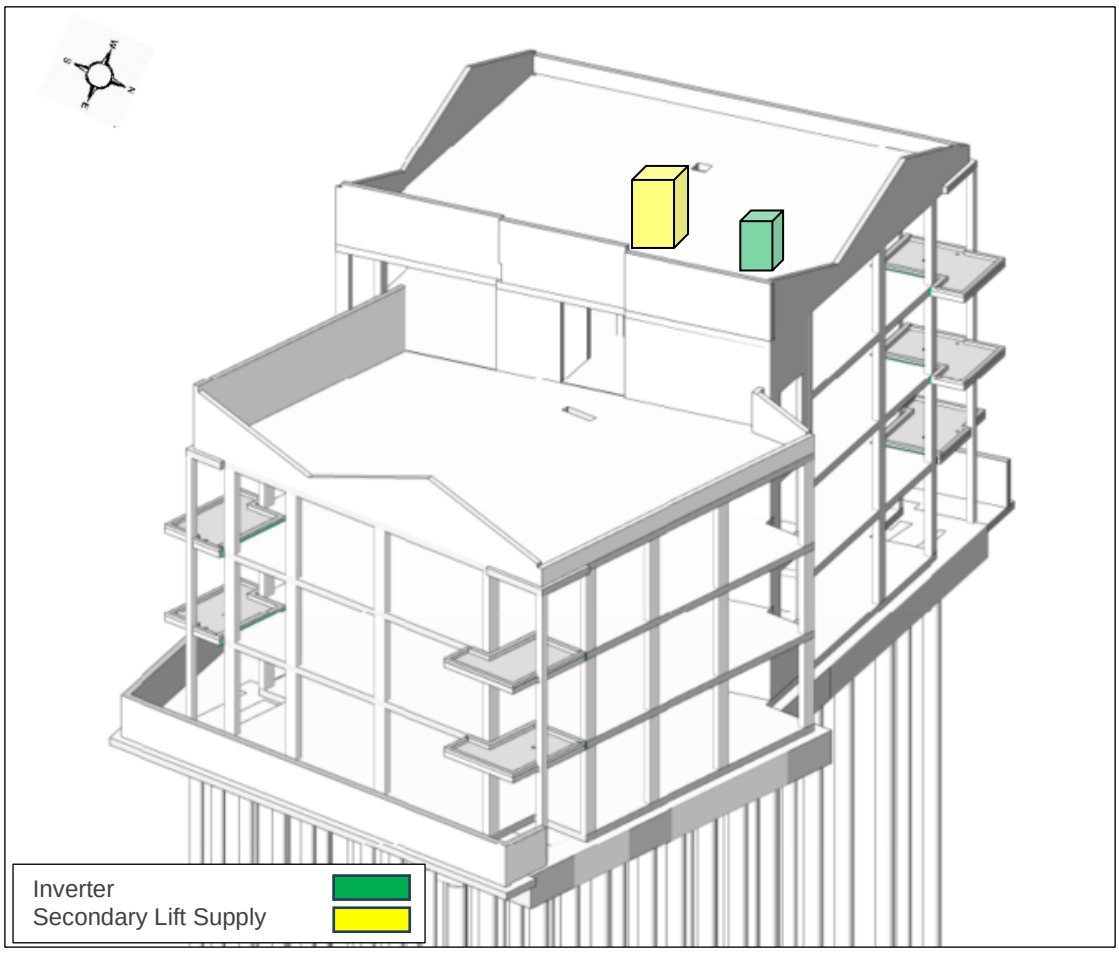
Type of plant	Location	Make	Model	No. of items
Inverter	Plot 6 Roof	Solax	X3-PRO-10K-G2	1
Inverter	Plot 5 Roof	Solax	X3-PRO-15K-G2	1
Supply for Lifts	Plot 5 roof / Plot 6 Roof	KOHLER	Power Pro EF300R	2

10.1.1 Plant Location

In correspondence with the design team we have received the following information via email ; "*If the inverter is on the roof it should be north facing and would be mounted on the frame at approx. 1500mm to the top of the unit. It would have to be on a flat surface and 1.5m from the edge of the roof*"

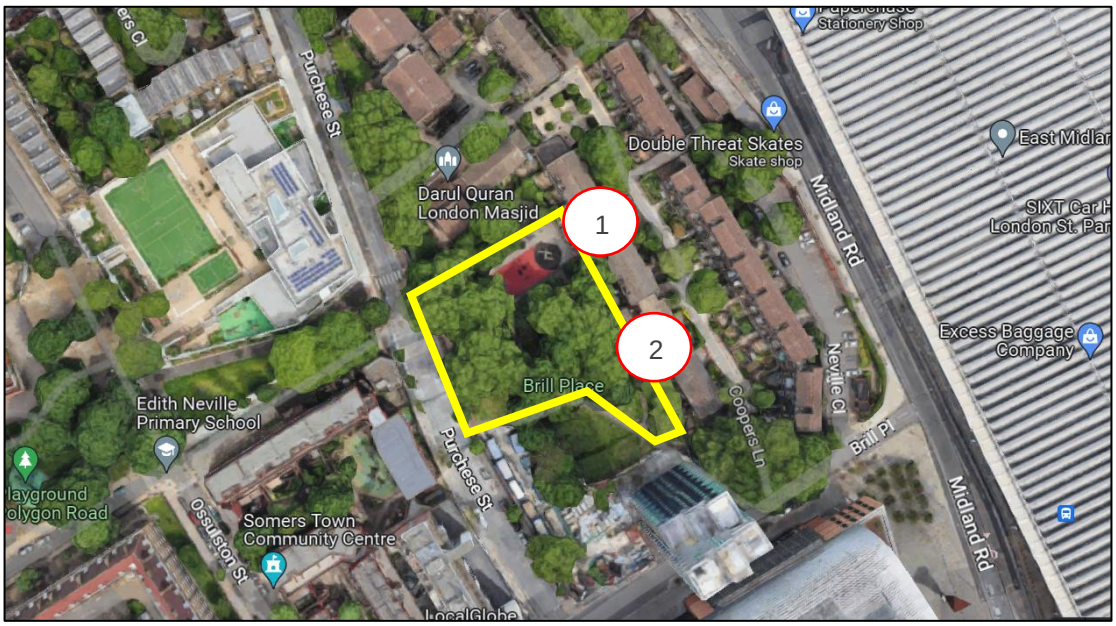
The approximate plant locations based on the above descriptions are shown in the drawings overleaf:

Drawing titled “GA Plan Rood Plot 5”, provided by Morgan Sindal Ltd



Drawing titled “GA Plan Rood Plot 6”, provided by Morgan Sindal Ltd

The plan below shown the locations at which we have identified the nearest noise sensitive receptors.



Based on the drawings provided by Morgan Sindal Ltd and Google maps we have identified the distances from the proposed plant locations to the nearest noise sensitive windows to be as follows:

Plant Reference	Distance from respective Plot roof's edge with respect to the line of sight with Receptor 1	Total Distance to 1m from Receptor 1
Plot 5 Inverter	1.5m	11m
Plot 5 Secondary Power Supply	8.5m	16m
Plot 6 Inverter	3m	29m
Plot 6 Secondary Power Supply	5m	31m

Plant Reference	Distance from respective Plot roof's edge with respect to the line of sight with Receptor 2	Total Distance to 1m from Receptor 2
Plot 5 Inverter	16m	51m
Plot 5 Secondary Power Supply	13m	48m
Plot 6 Inverter	1.5m	12.5m
Plot 6 Secondary Power Supply	5m	15m

10.1.2 Plant Operation

We understand that the proposed plant will operate both at daytime and night-time hours.

10.1.3 Plant Noise Data

We understand the manufacturer's noise data for the equipment to be as follows:

Plant Reference	Model	Manufacturer's single figure Noise Level @1m
Plot 5 Inverter	X3-PRO-10K-G2	35 dB (A)
Plot 6 Inverter	X3-PRO-15K-G2	55 dB (A)
Plot 5/Plot 6 Secondary Power Supply	Power Pro EF300R	57 dB (A)

We understand that the Power Supply units will be located within a GPR enclosure, however the enclosure will not provide any additional acoustic features.

10.2 Plant Noise Impact Assessment

The following tables summarise our predictions of atmospheric noise emissions from the proposed plant, considering the recommended mitigation measures set out in Section 10.3, to the nearest noise sensitive residential window.

10.2.1 Noise Sensitive Receptor 1

	Sound Pressure Level (dBA)
	Night-time (23:00 – 07:00 hours)
Cumulative Plot 5 Inverter Noise Emission	55 @ 0.5 m
Barrier Loss (Rooftop)	-9
Conformal Area Distance Loss (11m)	-17
Calculated Noise Level at Receptor	29
Plot 5 Secondary Power supply Noise Emission within Enclosure	57 @ 1m
Barrier Loss (Rooftop)	-14
Conformal Area Distance Loss (16m)	-18
Calculated Noise Level at Receptor	25
Cumulative Plot 6 Inverter Noise Emission	35 @ 0.5 m
Barrier Loss (Rooftop)	-5

	Sound Pressure Level (dBA)
	Night-time (23:00 – 07:00 hours)
Conformal Area Distance Loss (29m)	-27
Calculated Noise Level at Receptor	3
Plot 6 Secondary Power supply Noise Emission within Enclosure	57 @ 1m
Barrier Loss (Rooftop)	-6
Conformal Area Distance Loss (31m)	-22
Calculated Noise Level at Receptor	29
Cumulative Noise Level at Receptor 2	**33**

Our calculations indicate that the proposed plant, in conjunction with the proposed mitigation measures, should be capable of achieving the requirements of the Local Authority outlined in Section 9.0.

10.2.2 Noise Sensitive Receptor 2

	Sound Pressure Level (dBA)
	Night-time (23:00 – 07:00 hours)
Cumulative Plot 5 Inverter Noise Emission	55 @ 0.5 m
Barrier Loss (Rooftop)	-8
Conformal Area Distance Loss (51m)	-30
Calculated Noise Level at Receptor	17
Plot 5 Secondary Power supply Noise Emission without attenuation	57 @ 1m
Barrier Loss (Rooftop)	-7
Conformal Area Distance Loss (48m)	-27
Calculated Noise Level at Receptor	23
Cumulative Plot 6 Inverter Noise Emission	35 @ 0.5 m
Conformal Area Distance Loss (12.5m)	-20
Barrier Loss (Rooftop)	-7
Calculated Noise Level at Receptor	8
Plot 6 Secondary Power supply Noise Emission without attenuation	57 @ 1m
Barrier Loss (Rooftop)	-12
Conformal Area Distance Loss (15m)	-17
Calculated Noise Level at Receptor	28

	Sound Pressure Level (dBA)
	Night-time (23:00 – 07:00 hours)
Cumulative Noise Level at Receptor 2	**29**

Our calculations indicate that the proposed plant, with the proposed layout, should be capable of achieving the requirements of the Local Authority outlined in Section 9.0.

11.0 Conclusions

A detailed environmental noise survey has been undertaken in order to establish the currently prevailing environmental noise climate around the site.

The environmental noise impact upon the proposed dwellings has been assessed in the context of building regulations, and national and local planning policies.

Plant noise emission criteria have been recommended based on the results of the noise survey and with reference to the Local Authority's requirements.

An assessment has been carried out to determine the plant noise emissions at the nearest noise sensitive windows.

The assessment indicates that the proposed plant, with the proposed layout, should be capable of achieving the proposed environmental noise criteria at the nearest noise sensitive residential receptors.

Appendix A

The acoustic terms used in this report are defined as follows:

dB — Decibel - Used as a measurement of sound level. Decibels are not an absolute unit of measurement but an expression of ratio between two quantities expressed in logarithmic form. The relationships between Decibel levels do not work in the same way that non-logarithmic (linear) numbers work (e.g. 30dB + 30dB = 33dB, not 60dB).

dBA — The human ear is more susceptible to mid-frequency noise than the high and low frequencies. The 'A'-weighting scale approximates this response and allows sound levels to be expressed as an overall single figure value in dBA. The $_A$ subscript is applied to an acoustical parameter to indicate the stated noise level is A-weighted

It should be noted that levels in dBA do not have a linear relationship to each other; for similar noises, a change in noise level of 10dBA represents a doubling or halving of subjective loudness. A change of 3dBA is just perceptible.

$L_{90,T}$ — L_{90} is the noise level exceeded for 90% of the period *T* (i.e. the quietest 10% of the measurement) and is often used to describe the background noise level.

$L_{eq,T}$ — $L_{eq,T}$ is the equivalent continuous sound pressure level. It is an average of the total sound energy measured over a specified time period, *T*.

L_{max} — L_{max} is the maximum sound pressure level recorded over the period stated. L_{max} is sometimes used in assessing environmental noise where occasional loud noises occur, which may have little effect on the L_{eq} noise level.

L_p — Sound Pressure Level (SPL) is the sound pressure relative to a standard reference pressure of 2×10^{-5} Pa. This level varies for a given source according to a number of factors (including but not limited to: distance from the source; positioning; screening and meteorological effects).

L_w — Sound Power Level (SWL) is the total amount of sound energy inherent in a particular sound source, independent of its environment. It is a logarithmic measure of the sound power in comparison to a specified reference level (usually 10^{-12} W).

Appendix B

B. Planning Policies, Standards & Guidance

B.1 BS 4142:2014 + A1:2019

When setting plant noise emission criteria reference is commonly made to BS 4142:2014 "*Methods for rating and assessing industrial and commercial sound".*

The procedure contained in BS 4142:2014 provides an assessment of the likely effects of sound on people when comparing the specific noise levels from the source with representative background noise levels. Where the noise contains "a tone, impulse or other characteristic" then various corrections can be added to the specific (source) noise level to obtain the "rating level".

BS 4142 states that: *"The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs". An estimation of the impact of the specific noise can be obtained by the difference of the rating noise level and the background noise level and considering the following:*

• *"Typically, the greater this difference, the greater the magnitude of the impact."*

• *"A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context."*

• *"A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context."*

• *"The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context."*

The determination of the "rating level" and the "background level" are both open to interpretation, depending on the context.

B.2 Statutory Noise Nuisance

S79(1)(g) of the Environmental Protection Act 1990 defines a statutory nuisance as *"noise emitted from a premises so as to be prejudicial to health or a nuisance".* A duty is placed on the Local Authority to serve an abatement notice under S80 if it becomes satisfied that a statutory nuisance exists.

There is however no quantitative definition/objective method in determining statutory noise nuisance, and as such we are not able to definitively advise or determine on such matters. Noise nuisance is subjective and requires multiple factors to be considered, including but not limited to:

- Straining to hear something is *generally* considered not a nuisance, however,
- Noise level (of source and relative to background), timing, duration, type of noise, frequency, location, continuous or repetitive, all factor into judging nuisance.

To mitigate against, though not remove entirely, the risk of a statutory noise nuisance, a noise assessment should be undertaken by a Suitably Qualified Acoustician. Adoption of appropriate and relevant industry standards/guides can provide a structured framework for such assessments, improving the credibility of mitigation efforts. It is also important to also recognise that ongoing management (both active and passive) may also be necessary depending on the context of the situation.

B.3 Local Planning Policy

The site lies within the jurisdiction of London Borough of Camden. Camden's planning policy for controlling atmospheric noise emissions from building service plant is detailed in Appendix 3 of Camden Local Plan (adopted in July 2017). See below extraction from the Camden Local Plan.

"A relevant standard or guidance document should be referenced when determining values for 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).

Table C: Noise levels applicable to proposed industrial and commercial developments (including plant and machinery)

Existing Noise sensitive receptor	Assessment Location	Design Period	LOAEL (Green)	LOAEL to SOAEL (Amber)	SOAL (Red)
Dwellings**	Garden used for main amenity (free field) and Outside living or dining or bedroom window (façade)	Day	'Rating level' 10dB* below background	'Rating level' between 9dB below and 5dB above background	'Rating level' greater than 5dB above background
Dwellings**	Outside bedroom window (façade)	Night	'Rating level' 10dB* below background and no events exceeding 57dB L_{Amax}	'Rating level' between 9dB below and 5dB above background or noise events between 57dB and 88dB L_{Amax}	'Rating level' greater than 5dB above background and/or events exceeding 88dB L_{Amax}

**10dB should be increased to 15dB if the noise contains audible tonal elements. (day and night). However, if it can be demonstrated that there is no significant difference in the character of the residual background noise and the specific noise from the proposed development then this reduction may not be required. In addition, a frequency analysis (to include, the use of Noise Rating (NR) curves or other criteria curves) for the assessment of tonal or low frequency noise may be required.*

***levels given are for dwellings, however, levels are use specific and different levels will apply dependent on the use of the premises.*

"The periods in Table C correspond to 0700 hours to 2300 hours for the day and 2300 hours to 0700 hours for the night. The Council will take into account the likely times of occupation for types of development and will be amended according to the times of operation of the establishment under consideration."

"There are certain smaller pieces of equipment on commercial premises, such as extract ventilation, air conditioning units and condensers, where achievement of the rating levels (ordinarily determined by a BS:4142 assessment) may not afford the necessary protection. In these cases, the Council will generally also require a NR curve specification of NR35 or below, dependant on the room (based upon measured or predicted Leq,5mins noise levels in octave bands) 1 metre from the façade of affected premises, where the noise sensitive premise is located in a quiet background area."

Section 6.100 of the Camden Local Plan (2017) also sets out requirements for controlling atmosphere noise emissions from emergency building services plant as follows:

“Emergency equipment such as generators which are only to be used for short periods of time will be required to meet the noise criteria of no more than 10dB above the background level (L90 15 minutes). During standby periods, emergency equipment will be required to meet the usual criteria for plant and machinery. Conditions to this effect may be imposed in instances where emergency equipment forms part of the application.”