ZONA ACOUSTICS

6J King Henry's Road
London

Plant Noise Assessment

18 December 2024

For

Jurgen Kehn

CONTENTS

Summary

Zona Acoustics has been appointed to carry out a noise assessment in relation to the proposed external plant installation at 6J King Henry's Road in London. Proposals are for the installation of one air source heat pump and two AC condenser units.

The local authority, Camden Council, has requirements in relation to building services noise affecting noise sensitive properties.

A noise limit has been set for the plant, based on the existing background noise levels and the Camden Council requirements.

The predicted rating level of the proposed plant installation was found to be in line with the Camden Council requirements. This is seen to relate to the No Observed Effect Level (NOEL), under national planning guidelines.

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Report Produced by	Sam Martin BSc (Hons) PGDip MIOA	T: 07595 286516 E: sam@zonaacoustics.com
Zona Acoustics	28 Crunden Road South Croydon CR2 6HD	www.zonaacoustics.com

1.0 Introduction

Zona Acoustics has been appointed to carry out a noise assessment in relation to the proposed external plant installation at 6J King Henry's Road in London. Proposals are for the installation of one air source heat pump and two AC condenser units.

This report presents the methodology and results of a noise survey to determine background noise levels that are representative of the nearest noise sensitive receptors, as well as an assessment of noise from the proposed plant in relation to the Camden Council requirements.

The report is technical in nature, and such, a summary of noise units and acoustic terminology are included in Appendix A for reference.

2.0 Description of Site

The site is located at 6J King Henry's Road, London, NW3 3RP.

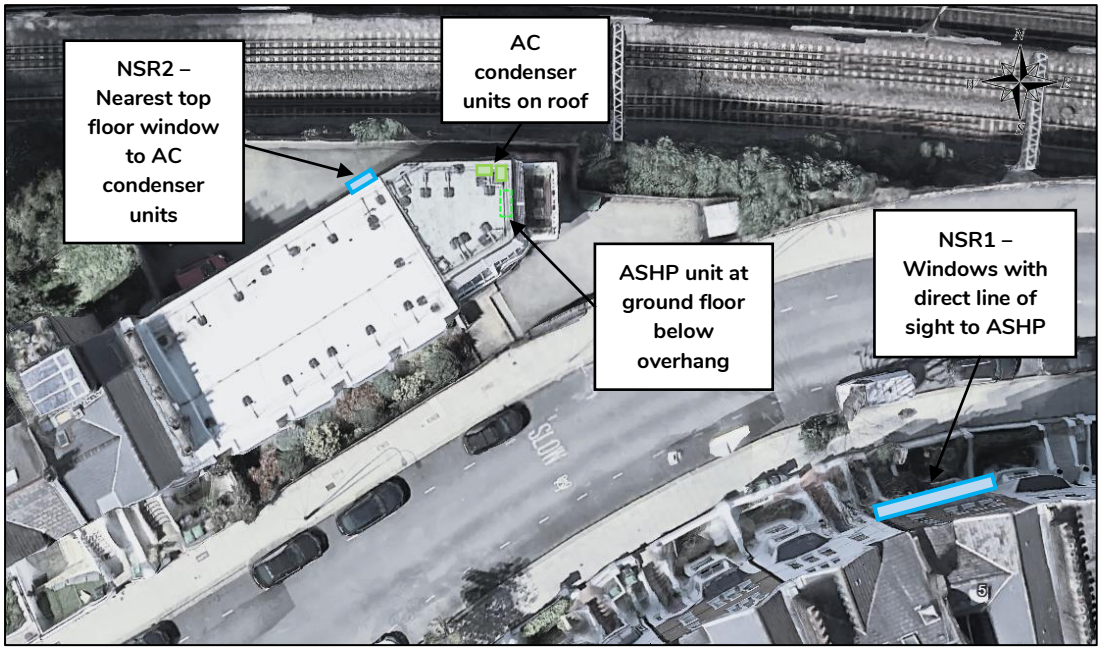
The proposed air source heat pump (ASHP) is to be located at ground floor on the northeast facing external wall of property below an overhang. The AC condenser units are to be located on the roof of the building. Proposed site plans are included in Appendix D.

The nearest / most exposed noise sensitive receptor to the proposed ASHP (NSR1) is taken to be the windows of a residential property on King Henry's Road, approximately 38m southeast of the proposed ASHP location. This receptor was chosen as being the nearest residential property with direct line of sight to the proposed ASHP location. Other surrounding receptors will be significantly screened from the unit by the exterior walls of the property, and are therefore less sensitive.

The nearest noise sensitive receptor to the AC condenser units (NSR2) is taken to be the nearest / most exposed top floor window on the northwest facing facade of the neighbouring residential property, approximately 7m and 8m from the proposed condenser unit locations. The unit will be screened from the nearest noise sensitive window by the roof, blocking line of sight to the units.

Figure 2.1 shows the site extent in **red**, the approximate proposed plant locations in **green**, and the nearest noise sensitive windows in **blue**. Proposed site plans are included in Appendix D.

Figure 2.1 Site and Surroundings



3.0 Noise Policy and Guidance

3.1 Camden Council Requirements

The Camden Council typical requirements for noise from fixed external plant are included in the Camden Local Plan 2017.

The requirement is for the rating level of the plant to be at least 10 dB below the existing background noise level (15dB if tonal components are present) at the assessment location, when assessed in accordance with British Standard 4142:2014 '*Methods for rating and assessing industrial and commercial sound*'.

3.2 British Standard 4142: 2014

British Standard (BS) 4142: 2014 (superseded by BS 4142: 2014+A1: 2019) provides a procedure for the measurement and rating of noise levels form industrial and commercial noise sources. A methodology for predicting the likelihood of adverse impact is provided in the document.

The rating level ($L_{Ar,Tr}$) is defined in BS 4142 and is used to rate the industrial source (known as the specific noise source) at the assessment location. This level is obtained by adding a correction of between 0 and 6 dB, for tonal noise sources, and a correction of between 0 and 9 dB for impulsive sources. Additionally, corrections of 3 dB can be made for other sound characteristics and intermittency of the noise source.

The rating level is assessed in terms of $L_{Ar,Tr}$, where 'T' is a reference period of one hour during the daytime period (07:00 - 23:00) and fifteen minutes during the night-time period (23:00 – 07:00).

The method for predicting the likelihood of complaints is based on differences between the rating level and the background $L_{A90,T}$ noise level. The standard states that:

a) "Typically, the greater this difference, the greater the magnitude of the impact.

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

c) A difference of around +5 dB is likely to be an indication of an adverse impact, depending on 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 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."

In this case, the rating level requirement is 10 dB below the existing background noise level, as required by Camden Council.

4.0 Noise Survey

4.1 Methodology

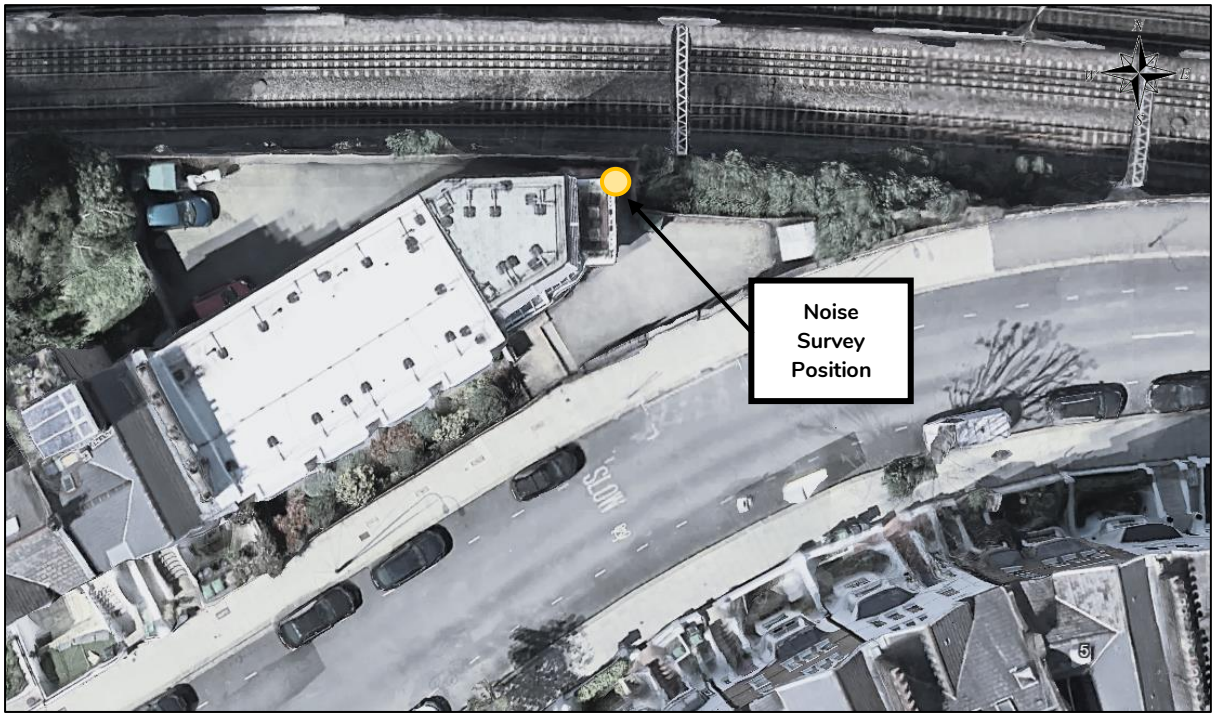
An unattended noise survey was carried out over a 48-hour period between 12:00 on Wednesday 8 May and 12:00 on Friday 10 May 2024 to determine existing background noise levels at a position representative of the nearest noise sensitive receptor.

The measurement microphone was positioned on the third-floor level balcony in the acoustic free-field.

The measurement position is considered representative of the nearest noise sensitive receptors.

The approximate location of the measurement position is shown in **orange** in Figure 4.1 below.

Figure 4.1 Noise Survey Position



The equipment used for the noise survey is summarised in Table 4.1

Table 4.1 Noise Survey Equipment

Item	Make & Model	Serial Number
Type 1 automated logging sound level meter	Svantek 958A	69866
Type 1 ½" microphone	PCB 377B02	167581
Calibrator	Casella CEL 120-1	3864607

L_{Aeq} and L_{A90} sound pressure levels were measured throughout the noise survey over continuous 15-minute intervals.

The noise monitoring equipment was calibrated before and after the noise survey period. No significant change was found. Laboratory equipment calibration certificates can be provided upon request.

Due to the nature of the noise survey, i.e. unattended, we are unable to comment on the weather conditions throughout the entire noise survey period, however at the beginning and end of the survey, weather conditions were dry with measured wind speeds of less than 5 ms-1 (the microphone was fitted with a weather protection kit/windshield). These conditions are understood to be representative of the survey period. Weather conditions are not considered to have had any significant effect on the measured noise levels.

4.2 Results

Appendix B presents a time history graph showing the sound pressure levels measured throughout the noise survey.

Due to the nature of the noise survey, i.e. unattended, we are unable to comment on the exact noise climate throughout the entire survey period. However, at the beginning and end of the survey period, the noise climate at the measurement position was noted to be dominated by distant road traffic noise and passing trains from the railway to the north of the site.

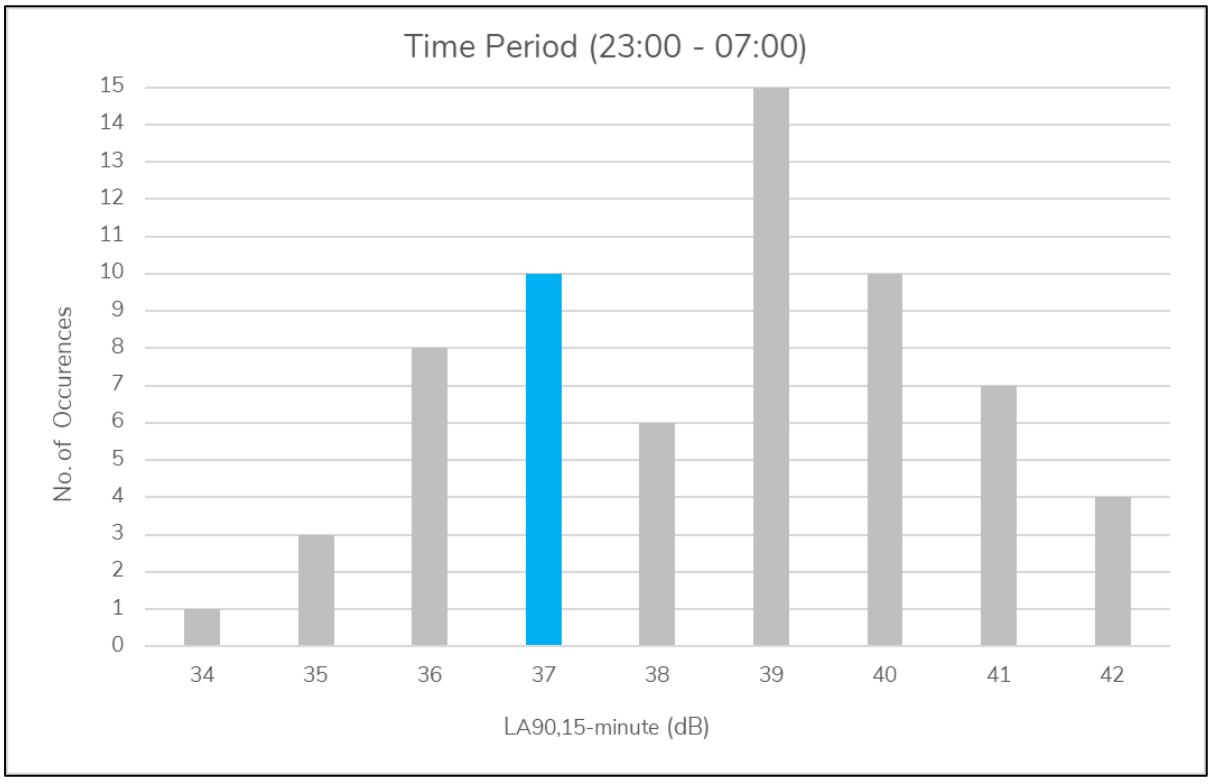
The proposed plant has the potential to operate at any time during the day or night-time periods. Our assessment therefore considers the background noise levels during the night-time period, which provides a worst-case assessment.

In accordance with BS 4142, the rating level should be assessed against a 'representative' background level.

BS 4142 states that "*a representative level ought to account for the range of background sound levels and ought not automatically to be assumed to be either minimum or modal value*".

Figure 4.2 below presents an analysis of the measured background noise levels during the night-time periods of the noise survey.

Figure 4.2 Background Noise Level Analysis



Based on the analysis above, we have considered **37 dB $L_{A90\ (15\text{-}minute)}$** as the representative background noise level for this assessment. The measured background noise levels were at or above this level 81% of the time during the night-time periods of the survey.

5.0 Plant Noise Assessment

5.1 Plant Noise Limit

Based on the representative background noise level determined above and the Camden Council requirements (as detailed in Section 3.1), the plant noise limit is **27 dB $L_{Ar,Tr}$** at the nearest noise sensitive windows.

5.2 Proposed Plant

The proposed plant units are understood to be as follows:

- Air Source Heat Pump - Mitsubishi PUZ-WM85VAA - Manufacture's operating Sound Power Level 58 dB L_{WA}.
- AC Condenser Unit 1 – COOLYOU Model: SKOV3-24 - Manufacture's operating Sound Power Level 68 dB L_{WA}.
- AC Condenser Unit 2 – COOLYOU Model: SKOV2-18 - Manufacture's operating Sound Power Level 63 dB L_{WA}.

The octave band noise levels are included in the detailed plant noise calculations in Appendix C. Analysis of the manufacturer's octave band data indicate that the noise is non-tonal in character. The units may operate intermittently, however, given that the specific noise level from the plant is be controlled to a level at least 10dB below the background level, it is considered that noise from the plant will not be generally audible at the nearest noise sensitive receptor locations.

On this basis, acoustic character corrections are not considered appropriate and the rating level requirement remains 10dB below the background level, providing a strong indication of a low impact.

5.3 Assessment

We have carried out calculations to predict the plant noise emissions at the nearest noise sensitive receptors.

A summary of the assessment results are presented in Tables 5.1 and 5.2 below. Detailed plant noise calculations are included in Appendix C.

Table 5.1 Plant Noise Assessment - NSR1 - ASHP

Element	Noise Level (dB)
Calculated Rating Noise Level at the Nearest Noise Sensitive Window ($L_{Ar,Tr}$)	22
Noise Limit	27
Difference	-5

Table 5.2 Plant Noise Assessment - NSR2 – AC Condenser Units

Element	Noise Level (dB)
Calculated Rating Noise Level at the Nearest Noise Sensitive Window ($L_{Ar,Tr}$)	27
Noise Limit	27
Difference	0

As can be seen in Tables 5.1 and 5.2 above - The predicted rating level of the proposed plant installation is in line with the Camden Council requirements. This is seen to relate to the No Observed Effect Level (NOEL), under national planning guidelines.

5.4 Vibration

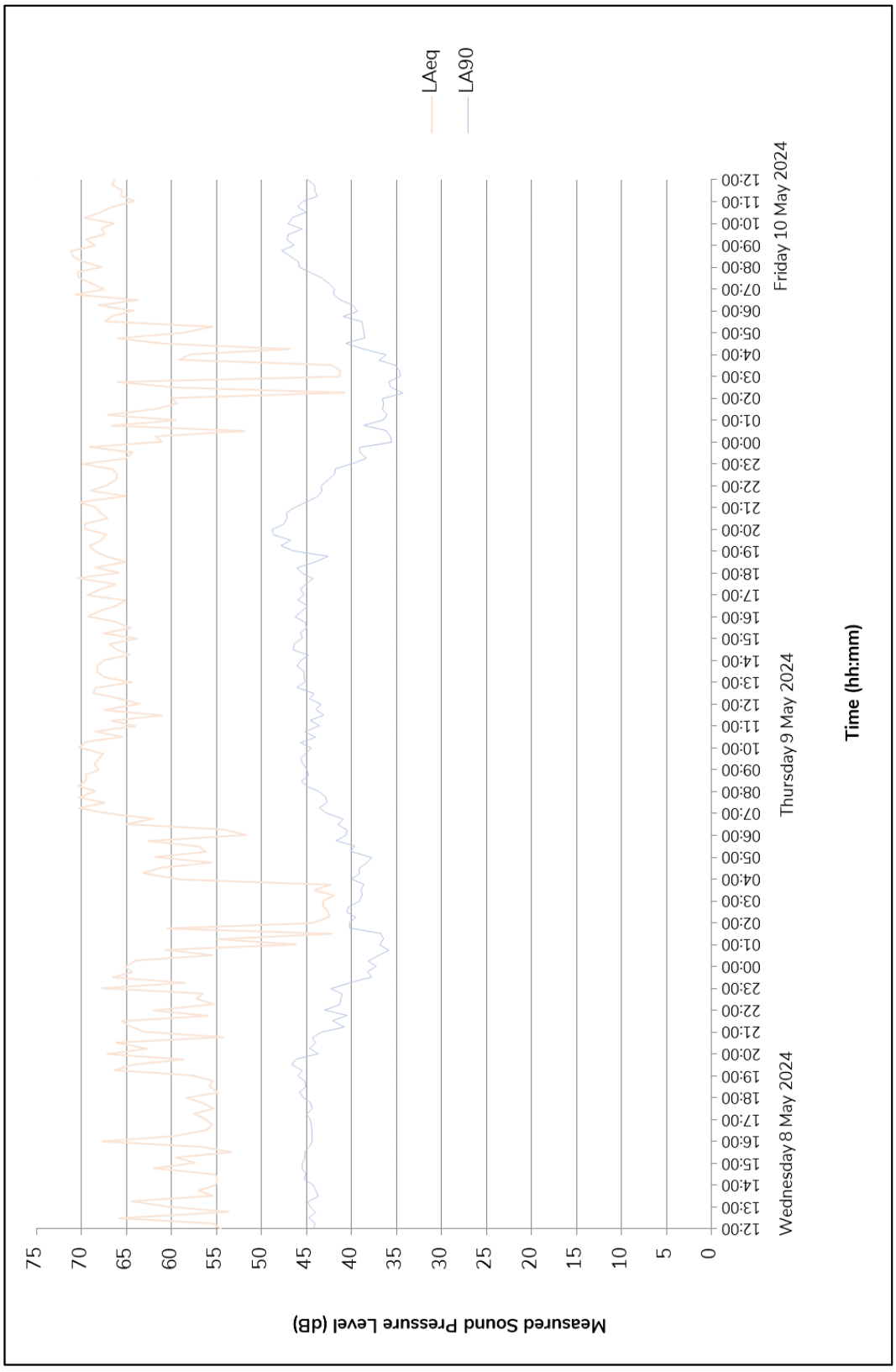
The external units should be installed using anti-vibration fixings and rubber washings on screws/bolts, to dampen vibration transmitting through the fixings and radiating through any structures.

Such mounts would usually be made of a resilient material such as rubber and should be supplied by the manufacturer (as standard) and then applied to any connection with the structure, including floors, walls, and soffits.

Appendix A – Acoustic Terminology

Parameter	Description
Decibel (dB)	A logarithmic scale representing the sound pressure or power level relative to the threshold of hearing ($20x10^{-6}$ Pascals).
Sound Pressure Level (L_p)	The sound pressure level is the sound pressure fluctuation caused by vibrating objects relative to the threshold of hearing.
Sound Power Level (L_w)	A measure of the acoustic energy emitted from a source of noise, expressed in decibels.
A-weighting (dBA)	The sound level in dB with a filter applied to increase certain frequencies and decrease others to correspond with the average human response to sound.
$L_{Aeq,T}$	The A-weighted equivalent continuous noise level over the time period T (typically T= 16 hours for daytime periods, T = 8 hours for night-time periods). This is the sound level that is equivalent to the average energy of noise recorded over a given period.
$L_{A90\ (15\ min)}$	The noise level exceeded for 90% of the time (also referred to as the background noise level), measured over a 15-minute period

Appendix B – Time History Graphs



Appendix C – Detailed Plant Noise Calculations

6J King Henry's Road	ZONA ACOUSTICS								
Plant Noise Calculations - NSR1 - ASHP									
Mitsubishi PUZ-WM85VAA	dBA	63	125	250	500	1k	2k	4k	8k
Sound Power Levels Lw	58	61	61	62	57	49	48	40	34
Acoustic Reflections		+3	+3	+3	+3	+3	+3	+3	+3
Distance Attenuation (38m)		-40	-40	-40	-40	-40	-40	-40	-40
Sound Pressure Level at Nearest Noise Sensitive Receptor	22	24	24	25	20	12	11	3	0
Night-time Noise Limit	27								
Difference	-5								

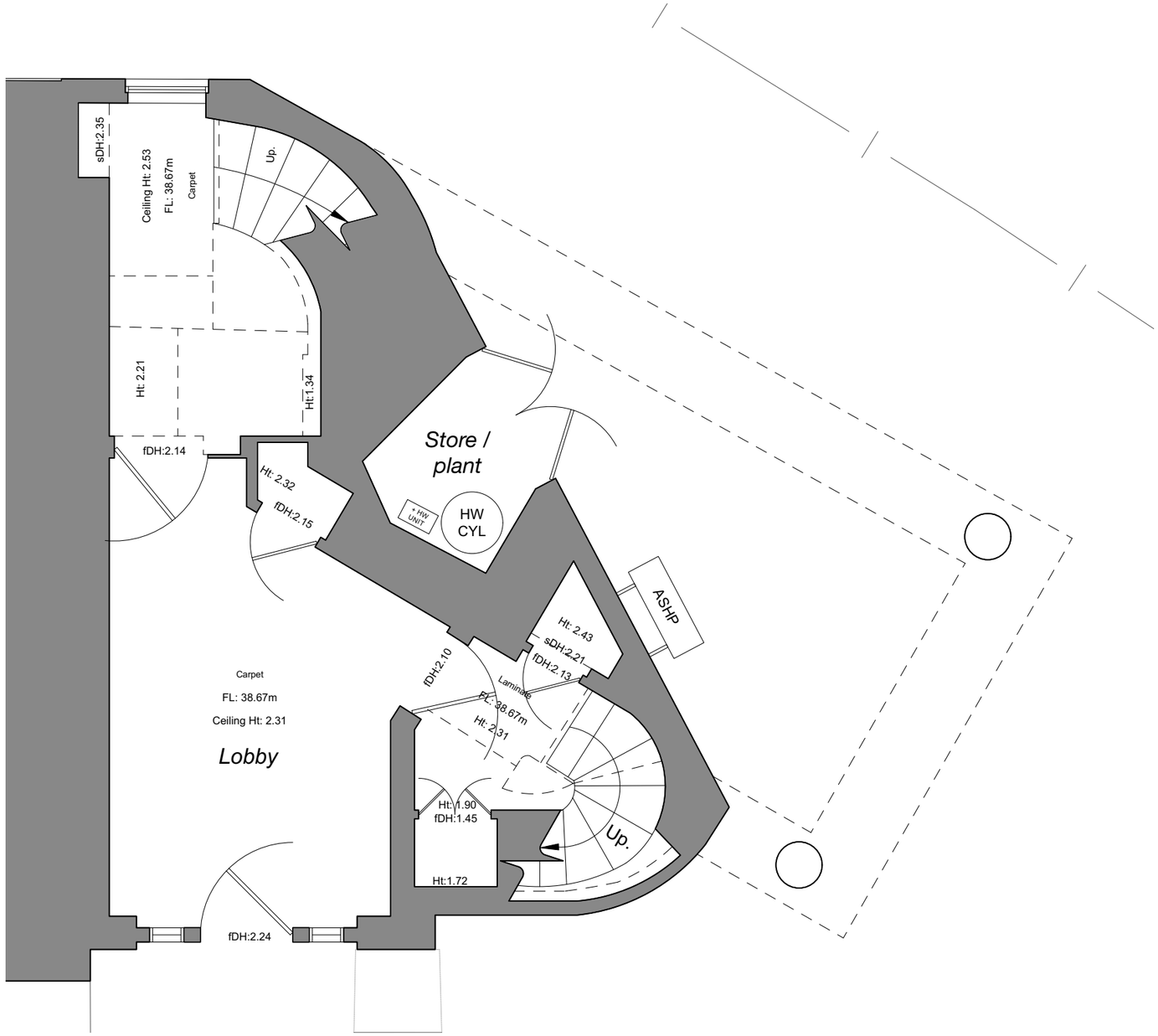
6J King Henry's Road	ZONA ACOUSTICS								
Plant Noise Calculations - NSR2 - AC Condenser Units									
SKOV3-24	dBA	63	125	250	500	1k	2k	4k	8k
Sound Power Levels Lw	68	71	69	70	65	64	59	52	46
Screening (Roof)		-10	-12	-14	-17	-20	-20	-20	-20
Distance Attenuation (8m)		-26	-26	-26	-26	-26	-26	-26	-26
Sound Pressure Level at Nearest Noise Sensitive Receptor	26	35	31	30	22	18	13	6	0
SKOV2-18	dBA	63	125	250	500	1k	2k	4k	8k
Sound Power Levels Lw	63	66	64	65	60	59	54	47	41
Screening (Roof)		-10	-12	-14	-17	-20	-20	-20	-20
Distance Attenuation (7m)		-25	-25	-25	-25	-25	-25	-25	-25
Sound Pressure Level at Nearest Noise Sensitive Receptor	22	32	28	26	19	15	9	2	0
Total Sound Pressure Level at Nearest Noise Sensitive Receptor	27	37	33	31	24	20	14	7	0
Night-time Noise Limit	27								
Difference	0								

Appendix D – Site Plans

For construction purposes:
- Do not scale this drawing.
- All dimensions and levels to be checked on site.
- Discrepancies to be reported to Miltiadou Cook Mitzman architects before proceeding.
- If in any doubt about information on this drawing contact Miltiadou Cook Mitzman architects.

REVISION

NUMBER	DATE	BY	NOTES
A	03/05/2024	ME	Issued to client for discussion
P1	12/06/2024	ME	Issued to planning (pre-app)
C	10/10/2024	ME	Issued for client approval
D	28/10/2024	ME	Issue for client approval



1 Proposed Ground Floor Plan
1:50

0 1.0 1.5 2.0 2.5 M

MILTIADOU COOK MITZMAN architects llp
020 7722 8525
office@mcma.design
www.mcma.design
Unit 1 Primrose Mews
Sharpleshall Street
London NW1 8YW

CLIENT
Mr J Kehn

PROJECT
6J King Henry's Road
London
NW3 3RP

SHEET TITLE
Proposed Ground Floor Plan

SCALE
1:50

DATE CREATED **FILE REFERENCE**

DRAWING NUMBER **REVISION**
419-DWG-102 D

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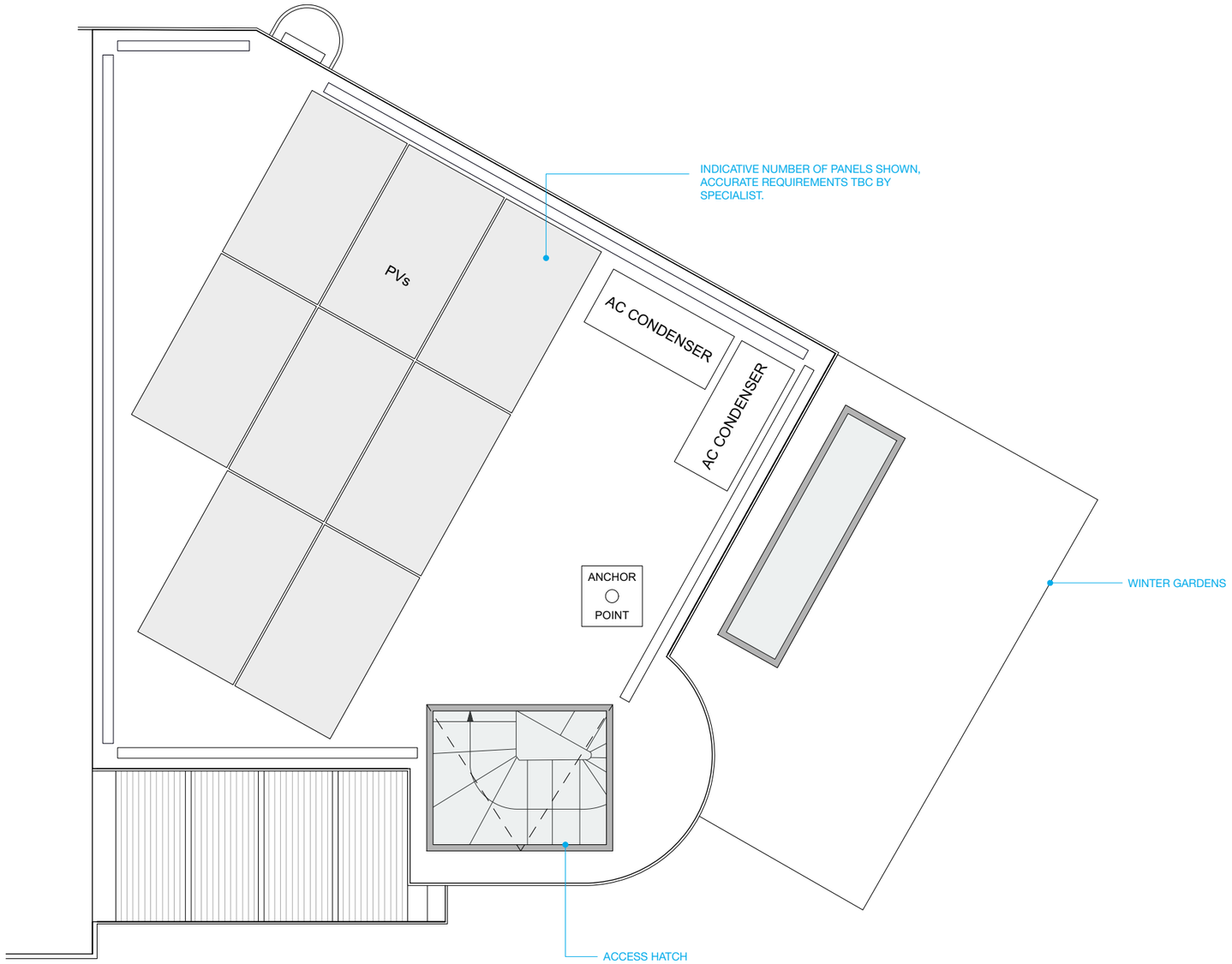
REVISION

NUMBER	DATE	BY	NOTES
C	10/10/2024	ME	Issued for client approval
D	28/10/2024	ME	Issue for client approval
P2	18/12/2024	ME	Issued for planning permission



1 Proposed Roof Plan
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0 1.0 1.5 2.0 2.5 M

MILTIADOU COOK MITZMAN architects llp
020 7722 8525
office@mcma.design
www.mcma.design
Unit 1 Primrose Mews
Sharpleshall Street
London NW1 8YW

CLIENT
Mr J Kehn

PROJECT
6J King Henry's Road
London
NW3 3RP

SHEET TITLE
Proposed Roof Plan

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419-DWG-106 P2