

ZONA ACOUSTICS

**167A Finchley Road
London**

Plant Noise Assessment

13 September 2023

For
My Healthcare Ltd
18 Wimpole St
London
W1G 8GD

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Summary

Zona Acoustics has been appointed to carry out a noise assessment in relation to the proposed mechanical plant installation at 167A Finchley Road in London. Proposals are for the installation of two external condenser units and a mechanical ventilation system serving the ground and lower ground floors.

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

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

The predicted rating level of the proposed plant 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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1.0 Introduction

Zona Acoustics has been appointed to carry out a noise assessment in relation to the proposed mechanical plant installation at 167A Finchley Road in London. Proposals are for the installation of two external condenser units and a mechanical ventilation system serving the ground and lower ground floors.

This report presents the methodology and results of a noise survey to determine background noise levels that are representative of the nearest noise sensitive receptor, 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 167A Finchley Road, London, NW3 6LB.

The proposed plant will serve a healthcare clinic (My Healthcare Clinic).

The proposed condenser units will be located externally at lower ground floor level on the rear south west facing wall overlooking the car parking area. It is understood that the units will be installed on the wall at a height of approximately 2m.

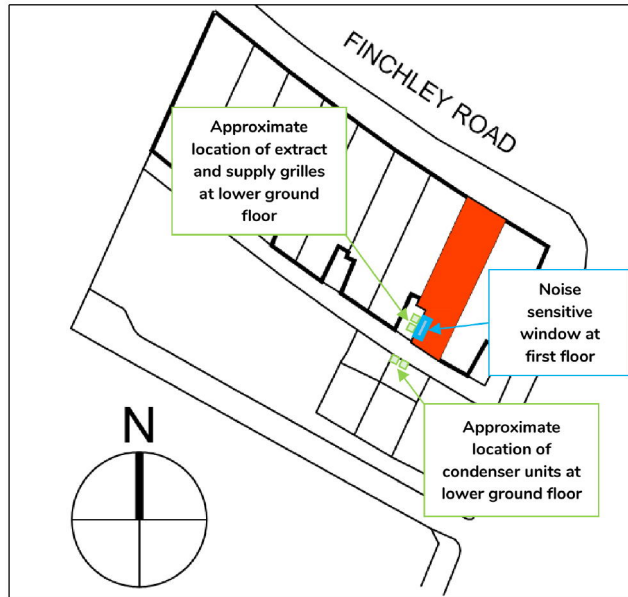
The external extract and supply grilles of the ventilation system will be located at lower ground floor level, facing out to the small courtyard area.

It is understood that the nearest residential properties are located on the floors above, with the nearest habitable rooms being located on the first floor, the ground floor being the entrance hall and stairs to the residential properties above.

For this assessment, we have considered the nearest noise sensitive receptor to be a residential window on the first floor of the north west facing façade, overlooking the small courtyard area. This receptor location was chosen due to being screened from the surrounding environmental noise sources, where background noise levels are therefore likely to be lowest.

Figure 2.1 shows the site extent in **red**, the approximate proposed plant locations in **green**, and the nearest noise sensitive window in **blue**.

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 from industrial and commercial noise sources. A methodology for predicting the likelihood of adverse impact is provided in the document.

The rating level ($L_{A,T,r}$) 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 $L_{A,T}$, 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

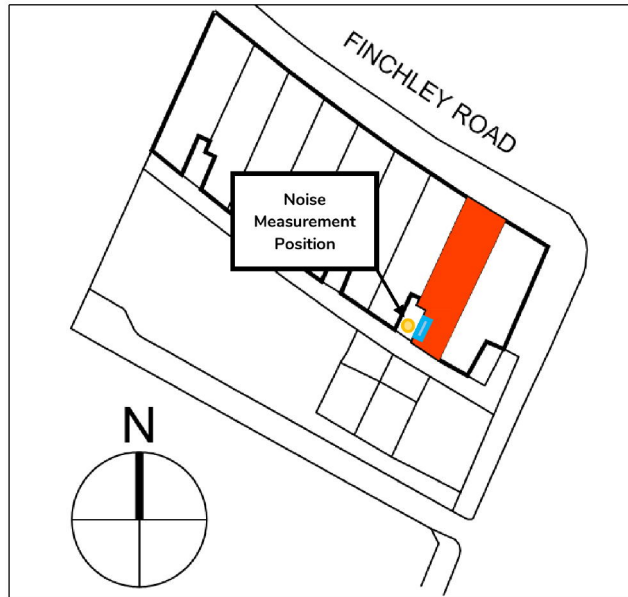
An unattended noise survey was carried out over a 72-hour period between 11:00 on Tuesday 29 August and 11:00 on Friday 1 September 2023 to determine existing background noise levels at a position representative of the nearest noise sensitive receptor.

The measurement microphone was positioned 1m outside of a lower ground floor window on the north west façade facing out to the small court yard area.

The measurement position was located below the first-floor level noise sensitive window (as indicated in Figure 2.1) and was screened further from the surrounding environmental noise sources by the walls of the courtyard. The measured background noise levels are therefore likely to be lower than those at the noise sensitive window and are considered to provide a worst-case assessment.

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

Figure 4.1 Noise Measurement 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	Casella CEL 633B	0221364
Type 1 ½" microphone	CEL 252	21198
Calibrator	Casella CEL 120-1	2651640

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, there was noted to be no rainfall and only light wind. 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.

The measurement position was located 1m from the nearest façade (acoustically reflective surface), therefore we have corrected the measured noise levels by -3 dB to equate to free-field conditions, in accordance with guidance given in BS 4142.

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.

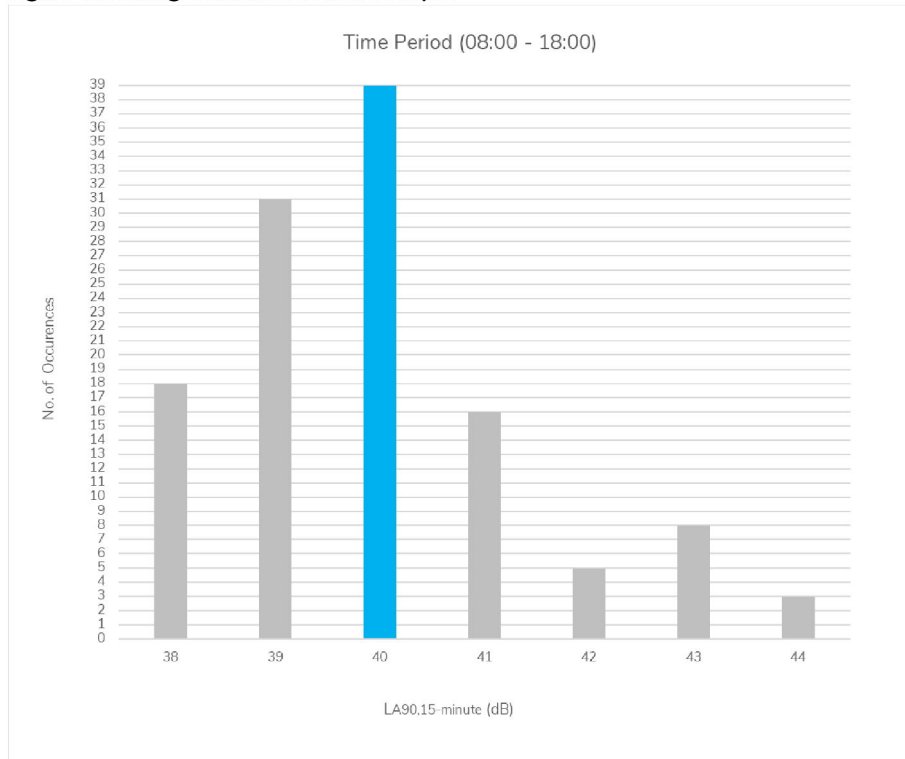
The proposed plant has the potential to operate at any time during the My Healthcare Clinic proposed opening times, which are understood to be between 08:00 and 18:00. Our assessment therefore considers the background noise levels measured during these periods.

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 proposed operation times.

Figure 4.2 Background Noise Level Analysis



Based on the analysis above, we have considered the typical (mode) level of **40 dB L_{A90} (15-minute)** as the representative background noise level for this assessment.

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 **30 dB $L_{A_{r,Tr}}$** at the nearest noise sensitive window.

5.2 Proposed Plant

The assessment is based on the following proposed plant installations:

- Condenser Units (2 units) - Midea M50-42FN8-Q - Manufacturer's Operating Sound Pressure Level at 1m - 58 dB(A) - Manufacturer's data is available as a single-figure sound pressure level only. Octave band spectra for an equivalent unit, corrected pro-rata to equate to the same single-figure value, has been used in this assessment.

- Ventilation System - Midea HRV-D500(B) – In-duct sound power levels have been calculated using the empirical calculation method based on the manufacture's nominal airflow (500 m³/h) and external static pressure Extract (110 Pa) and Supply (65 Pa). Calculated sound power levels are included in the detailed plant noise calculations in Appendix C. Attenuators will be fitted to the ductwork on the atmospheric side of the system. The required minimum attenuator insertion loss values are presented in the detailed plant noise calculations in Appendix C.

The octave band noise levels used in this assessment are included in the detailed plant noise calculations in Appendix C. Analysis of the octave band data indicate that the noise from the plant will be non-tonal in character, as is usually the case with these types of plant. The plant is also expected to operate continuously i.e. non-intermittently. No additional rating level character corrections are therefore considered necessary.

5.3 Assessment

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

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

Table 5.1 Plant Noise Assessment

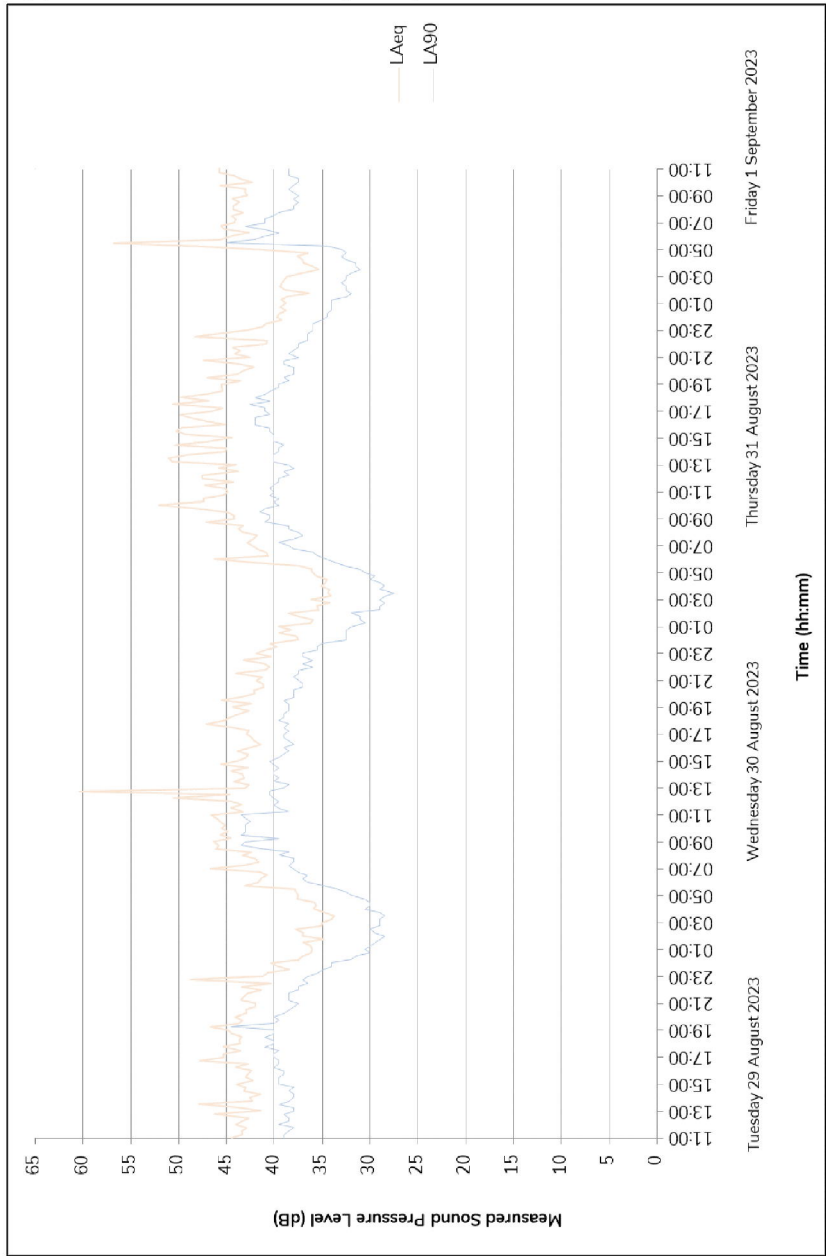
Element	Noise Level (dB)
Condenser Unit Rating Level at Noise Sensitive Window ($L_{A,T,r}$)	30
Extract Rating Level at Noise Sensitive Window ($L_{A,T,r}$)	19
Supply Rating Level at Noise Sensitive Window ($L_{A,T,r}$)	14
Total Rating Level at Noise Sensitive Window ($L_{A,T,r}$)	30
Noise Limit	30
Difference	0

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

Appendix A – Acoustic Terminology

Parameter	Description
Decibel (dB)	A logarithmic scale representing the sound pressure or power level relative to the threshold of hearing (20×10^{-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.
$L_{Aeq,T}$	<p>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).</p> <p>This is the sound level that is equivalent to the average energy of noise recorded over a given period.</p>
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

167a Finchley Road	ZONA ACOUSTICS								
Plant Noise Calculations									
Midea M50-42FN8-Q	dBA	63	125	250	500	1k	2k	4k	8k
Derived Sound Power Level based on Sound Pressure Level at 1m	72	75	74	72	70	67	63	56	50
Correction for 2 Units		+3	+3	+3	+3	+3	+3	+3	+3
Distance Attenuation (11m)		-29	-29	-29	-29	-29	-29	-29	-29
Screening (Wall)		-9	-11	-14	-16	-19	-20	-20	-20
Sound Pressure Level at Noise Sensitive Window	30	41	37	33	28	22	17	10	4
Ventilation Extract	dBA	63	125	250	500	1k	2k	4k	8k
Calculated In-duct Sound Power Level	60	71	67	60	55	54	51	48	43
Minimum Attenuator Insertion Loss		-2	-4	-9	-15	-17	-14	-10	-8
Radius Bend x1		0	0	-1	-2	-3	-3	-3	-3
Grille Reflection		-11	-6	-3	-1	0	0	0	0
Directivity (90 degrees)		-1	-1	-3	-5	-6	-6	-6	-6
Distance Attenuation (5m)		-24	-24	-24	-24	-24	-24	-24	-24
Sound Pressure Level at Noise Sensitive Window	19	33	32	20	8	4	4	5	2
Ventilation Supply	dBA	63	125	250	500	1k	2k	4k	8k
Calculated In-duct Sound Power Level	55	66	62	55	50	49	46	43	38
Minimum Attenuator Insertion Loss		-2	-4	-9	-15	-17	-14	-10	-8
Radius Bend x1		0	0	-1	-2	-3	-3	-3	-3
Grille Reflection		-11	-6	-3	-1	0	0	0	0
Directivity (90 degrees)		-1	-1	-3	-5	-6	-6	-6	-6
Distance Attenuation (5m)		-24	-24	-24	-24	-24	-24	-24	-24
Sound Pressure Level at Noise Sensitive Window	14	29	28	16	4	0	0	1	0
Total Sound Pressure Level at Noise Sensitive Window	30	42	38	33	28	23	17	12	7
Noise limit	30								
Difference	0								