



**New London House
172 Drury Lane
London**

Plant Noise Assessment Report

14 August 2023

For
Karsons Consulting

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SUMMARY

Replacement condenser units are proposed on the roof of New London House at 172 Drury Lane in London.

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

auricl has undertaken a noise assessment of the proposed plant, in relation to the Camden Council requirements.

A noise limit has been proposed for the condenser units, based on the typical measured background noise level and the Camden Council requirements.

Recommendations have been made for attenuation measures to be applied to the proposed replacement condenser units.

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1.0 Introduction

Replacement condenser units are proposed on the roof of New London House at 172 Drury Lane in London.

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

auricl has been commissioned to carry out a noise assessment of the proposed plant, in relation to the Camden Council requirements.

This report presents the methodology and results of a noise survey to determine background noise levels that are representative of the nearest noise sensitive property, as well as an acoustic assessment of the replacement condenser units.

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 and Proposals

New London House is located on the north-eastern side of Drury Lane in central London.

The site is occupied by an office building on the lower levels, with a residential tower on top.

A plant area (containing existing condenser units, which are to be replaced) is located on the roof of the office building in the eastern corner of the site.

The nearest noise sensitive properties to the proposed condenser units are understood to be the residential apartments on the same floor level as the plant area.

Figure 2.1 shows the approximate site extent in **red** and surrounding properties, the residential tower in **blue** and the approximate location of the plant area shown in **orange**.

Figure 2.1 Site Extent and Surroundings



3.0 Camden Council Requirements

Camden Council typically requires that the Rating Level for fixed external plant (determined in accordance with BS 4142), including any character corrections for tonality, impulsivity etc. are controlled to a level at least 10 dB less than the lowest measured L_{A90} background noise level (15 dB if tonal components are present) at a distance of 1m external to nearest noise sensitive premises.

We have considered the above in our measurements and assessment, described in the following sections.

4.0 Noise Survey Methodology and Results

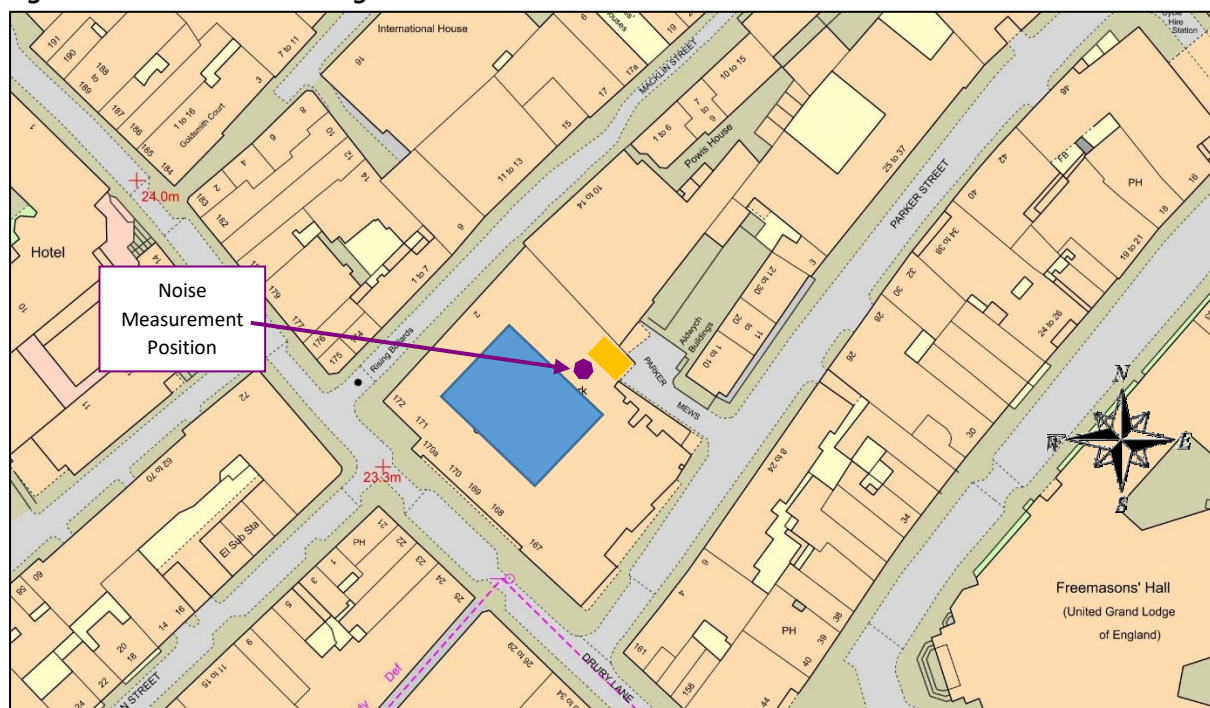
4.1 Methodology

A manned environmental noise survey was carried out between 14:00 – 15:00 hours on Wednesday 9 February 2022 to determine existing background noise levels at a position considered to be representative of the nearest noise sensitive property.

The existing plant was not in operation during the measurements, which were undertaken in a free-field position representative of the nearest noise sensitive properties – the residential properties located on the same level as the external plant area.

The approximate location of the measurement position is indicated in **purple** in Figure 4.1 below, with the residential tower in **blue** and the approximate location of the plant area shown in **orange**.

Figure 4.1 Site Plan Indicating Noise Measurement Position



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

Table 4.1 Description of Equipment used for Noise Survey

Item	Make & Model	Serial Number
Type 1 sound level meter	01dB FUSION	12032
Type 1 ½" external microphone	GRAS 40CE	330829
Calibrator	01 dB CAL 21	86020

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

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

During the survey period, there was noted to be no rainfall, a clear sky and only light wind. These conditions are considered appropriate for undertaking environmental noise measurements.

4.2 Results & Observations

Our measurements yielded a background noise level of 45 dB L_{A90} which is considered to be typical of daytime periods, when the condenser units are proposed to operate.

The noise climate at the measurement position was affected by typical central London activity noise – road traffic, pedestrian noise, etc.

We would consider the levels measured to be reasonable, taking into account the location of the measurement position and the dominant nearby noise sources.

5.0 Plant Noise Assessment

This section presents our assessment and calculations of noise emissions from the condenser units, in relation to the Camden Council requirements.

5.1 Plant Noise Limit

Based on the typical measured background noise level and the Camden Council requirements, the plant noise limit during the proposed operating period (07:00 – 19:00 hours, Monday to Friday) is **35 dB L_{Aeq} (1 hour)**.

This limit shall apply to the cumulative total of all relevant plant operating simultaneously and shall include any unfavourable characteristic corrections as per BS 4142: 2014.

5.2 Plant Noise Prediction

We have reviewed the proposed replacement condenser units, which are as follows:

- Unit 1A Daikin REYA18A 85 dB L_{WA} sound power level
- Unit 1B Daikin REYA16A 86 dB L_{WA} sound power level
- Unit 2A Daikin REYA22A 85 dB L_{WA} sound power level
- Unit 2B Daikin REYA20A 90 dB L_{WA} sound power level
- Unit 3A Daikin REYA22A 85 dB L_{WA} sound power level
- Unit 3B Daikin REYA20A 90 dB L_{WA} sound power level

It is assumed that all six units could operating simultaneously, as a worst-case.

The nearest residential window is on the same floor level as the plant area, approximately 5m from the units.

Unattenuated, our calculations indicate that the total plant noise level at this window would be 72 dB, therefore a total reduction of 37 dB would be required.

5.3 Noise Mitigation Measures

The required attenuation could be achieved by implementing both of the following:

- High performance acoustic enclosures fitted around the condenser units, providing overall sound reduction of at least 32 dB L_{pA} – see example and specification in Appendix B and
- A 100mm thick solid acoustic screen in place of the existing slatted timber screen that currently surrounds the external plant area – see example and specification in Appendix C

We have also considered the residential windows on higher floor levels, where this is a direct line of sight but extra distance, and the attenuation requirement should be commensurate with the acoustic enclosures described above.

6.0 Manufacturer Details

TO BE COMPLETED

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.
A-weighting (L_A or 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_{Amax}	The A-weighted maximum noise level measured during the measurement period.
$L_{Aeq,T}$	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 – Acoustic Enclosure Details

Acoustic Specification for Acoustic Enclosure

The acoustic enclosures shall be fitted to each replacement condenser unit.

The acoustic enclosure shall provide, in-situ, reduction of sound levels associated with the condenser units of at least 32 dB L_{pA} .

The acoustic performance of the enclosure shall take account of any loss of performance due to doors, windows, joints and ventilation openings etc.

The acoustic enclosure shall be constructed from double skinned acoustic panels suitable for external applications. The outer skin of the panels shall be manufactured from zinc coated mild steel (minimum thickness of 1.25mm). The inner skin of the panels shall be manufactured from galvanised perforated mild steel (minimum thickness of 0.8mm) having a free area of no less than 23%.

The infill material shall consist of inert, rot and vermin proof, non-hydroscopic mineral wool or glass fibre of a density sufficient to obtain the specified acoustic performance. The infill material shall be packed under not less than 5% compression to eliminate voids due to vibration and settling. The infill material shall be faced with a protective membrane to prevent fibre migration.

The enclosure shall be structurally self-supporting, to withstand on-site conditions, without additional stiffening. All steelwork shall be provided by the specialist manufacturer and be galvanised after manufacture.

Details of the proposed enclosures shall be submitted to, and approved by, [auricl](#).

Appendix C – Acoustic Screen Details

Acoustic Specification for Acoustic Screen

The acoustic screen shall extend continuously around the existing plant area on the north-western and south-western sides, in place of the existing slatted timber screen.

The screen shall extend from roof level up to the height of the existing concrete beam and be well-sealed to both.

The acoustic screen shall provide, in-situ, the following minimum sound reduction indices (SRI's) when tested in accordance with British Standard (BS) EN 20140.

Minimum Sound Reduction Index (dB) at Octave Band Centre Frequency (Hz)							
63	125	250	500	1k	2k	4k	8k
18	20	26	31	35	39	40	41

The internal faces of the acoustic screen shall provide the following minimum absorption coefficients when tested in accordance with British Standard (BS) EN 20354.

Minimum Absorption Coefficient at Octave Band Centre Frequency (Hz)					
125	250	500	1k	2k	4k
0.35	0.75	0.90	0.99	0.99	0.95

The sound reduction indices and absorption coefficients shall include any loss of performance due to doors, windows, joints and ventilation openings etc.

The acoustic screen/enclosure shall be constructed from double skinned acoustic panels suitable for external applications. The outer skin of the panels shall be manufactured from zinc coated mild steel (minimum thickness of 1.25mm). The inner skin of the panels shall be manufactured from galvanised perforated mild steel (minimum thickness of 0.8mm) having a free areas of no less than 23%.

The infill material shall consist of inert, rot and vermin proof, non-hydroscopic mineral wool or glass fibre of a density sufficient to obtain the specified acoustic performance. The infill material shall be packed under not less than 5% compression to eliminate voids due to vibration and settling. The infill material shall be faced with a protective membrane to prevent fibre migration.

The panels shall be structurally self-supporting, to withstand onsite conditions, without additional stiffening. All steelwork shall be provided by the specialist manufacturer and be galvanised after manufacture.

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