**Report VA5899.250520.NIA1.1**

# 72 Camden Mews, London

Noise Impact Assessment

**03 September 2025**

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## Contents



## Attachments

| Report Version | Author | Approved | Changes | Date |
|---|---|---|---|---|
| NIA | Ollie Brunt | Ben Alexander | - | 21/05/2025 |
| NIA1.1 | Ollie Brunt | Steven Liddell | Updated plant location with new enclosure | 02/09/2025 |

The interpretations and conclusions summarised in this report represent Venta Acoustics' best technical interpretation of the data available to us at the time of assessment. Any information provided by third parties and referred to in this report has not been checked or verified by Venta Acoustics, unless otherwise expressly stated in the document. Venta Acoustics cannot accept any liability for the correctness or validity of the information provided. Due to a degree of uncertainty inherent in the prediction of all parameters, we cannot, and do not guarantee the accuracy or correctness of any interpretation and we shall not, except in the case of gross or wilful negligence on our part, be liable for any loss, cost, damages or expenses incurred or sustained by anyone resulting from any interpretations, predictions of conclusions made by the company or employees. The findings and conclusions are relevant to the period of the site survey works, and should not be relied upon to represent site conditions at later dates. Where additional information becomes available which may affect the findings of our assessment, the author reserves the right to review the information, reassess the findings and modify the conclusions accordingly.

# 1. Introduction

It is proposed to install a new air source heat pump on the rear roof at 72 Camden Mews, London.

Venta Acoustics has been commissioned by Deborah Lincoln to undertake an assessment of the potential noise impact of these proposals in support of an application for planning permission.

An environmental noise survey has been undertaken to determine the background noise levels at the most affected noise sensitive receptors. These levels are used to undertake an assessment of the likely impact with reference to the planning requirements of Camden Council.

# 2. Design Criterion and Assessment Methodology

## 2.1 Camden Council Requirements

Camden Council's Local Plan (adopted June 2017), Appendix 3, provides the following guidance regarding noise from Industrial and Commercial Noise Sources

> *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).*

| Existing Noise sensitive receiver | 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 $L_{eq,5mins}$ 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.*

# 3. Site Description

As illustrated on attached site plan VA5899/SP1, the site building is located on Camden Mews surrounded on three sides by further residential properties - the two neighbouring properties on Camden Mews and the property to the rear on North Villas.

The most affected noise sensitive receivers are expected to be the rear of 70 and 74 Camden Mews as well as the rear of 12 North Villas.

# 4. Environmental Noise Survey

## 4.1 Survey Procedure & Equipment

In order to establish the existing background noise levels at the site, a noise survey was carried out between Wednesday 14th and Monday 19th May 2025 at the external first floor level location shown in site plan VA5899/SP1. This location was chosen to be representative of the background noise level at the most affected noise sensitive receivers.

Continuous 5-minute samples of the $L_{Aeq}$, $L_{Amax}$, $L_{A10}$ and $L_{A90}$ sound pressure levels were undertaken at the measurement location.

The weather during the survey period was generally dry with light winds. The background noise data is not considered to have been compromised by these conditions.

Measurements were made generally in accordance with ISO 1996 2:2017 *Acoustics - Description, measurement and assessment of environmental noise – Part 2: Determination of sound pressure levels*.

The following equipment was used in the course of the survey:

| Manufacturer | Model Type | Serial No | Calibration | |
|---|---|---|---|---|
| | | | Certificate No. | Date |
| Svantek Class 1 SLM | 971A | 143563 | 00002984-1 | 19/9/24 |
| Larson Davis calibrator | CAL200 | 13049 | 1509201-3 | 19/7/24 |

**Table 4.1 – Equipment used for the tests**

The calibration of the sound level meter was verified before and after use with no significant calibration drift observed.

## 4.2 Results

The measured sound levels are shown as time-history plots on the attached charts VA5899/TH1-5.

The background noise level is determined by road traffic noise from Camden Road and Camden Park Road.

The typical background noise levels measured were:

| Monitoring Period | Typical[1] $L_{A90,5min}$ |
|---|---|
| 07:00 – 23:00 hours | 36 dB |
| 23:00 – 07:00 hours | 31 dB |

**Table 4.2 – Minimum background noise levels [dB ref. 20 µPa]**

[1] The typical $L_{A90}$ value is taken as the 10th percentile of all $L_{A90}$ values measured during the relevant period.

## 4.3 Plant Noise Emission Limits

On the basis of the measured noise levels and the planning requirements of the Local Authority, and considering that it is not expected that tonal noise will be generated by the proposed plant units, the following plant specific sound levels should not be exceeded at the most affected noise sensitive receivers:

| Monitoring Period | Design Criterion ($L_{Aeq}$) |
|---|---|
| 07:00 – 23:00 hours | 26 dB |
| 23:00 – 07:00 hours | 21 dB |

**Table 4.3 – Specific sound pressure levels not to be exceeded at most affected noise sensitive receivers**

# 5. Predicted Noise Impact

## 5.1 Proposed plant

The following plant is proposed for installation at roof level at the location indicated on site plan VA5899/SP1.

| Plant Item | Quantity | Proposed Model | Notes |
|---|---|---|---|
| Air source heat pump | 1 | aroTHERM plus heat pump 5kW | Heating Mode |

**Table 5.1 – Indicative plant selections assumed for this assessment.**

The manufacturer has only published an overall dB(A) sound power level for the noted unit. Spectral noise data for an air source heat pump unit of similar form factor and source level has been assumed and shifted to meet the required overall level - as follows.

| Plant Item | Octave Band Centre Frequency (Hz) Sound Power Level, $L_w$ (dB) | | | | | | | | dB(A) |
|---|---|---|---|---|---|---|---|---|---|
| | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k | |
| aroTHERM plus heat pump 5kW | 55 | 62 | 59 | 52 | 43 | 38 | 31 | 29 | **54** |

**Table 5.2 – Advised plant noise data used for the assessment.**

## 5.2 Recommended Mitigation Measures

The client has provided Venta Acoustics with the specifications of the following enclosure to house the ASHP in Table 5.3.

| Attenuation Component | Octave Band Centre Frequency (Hz) Minimum Insertion Loss (dB) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k |
| Enclosure | 10 | 12 | 18 | 27 | 34 | 36 | 36 | 37 |

**Table 5.3 – Enclosure insertion loss**

All plant should be fitted with anti-vibration mounts in accordance with the manufacturer guidelines. This is expected to control structureborne noise to the building to acceptable levels.

Please note that the above recommendations relate to acoustic issues only. It is recommended that professional advice confirming the suitability of these measures be sought from others with regards to issues such as airflow, structural stability and visual impact.

## 5.3 Predicted noise levels

The plant noise level at the most affected noise sensitive receivers has been calculated on the basis of the above information and assuming the recommended mitigation measures, with reference to the guidelines set out in ISO 9613-2:2024 *Attenuation of sound during propagation outdoors - Part 2: Engineering method for the prediction of sound pressure levels outdoors.*

A summary of the calculations is shown in Appendix B.

| Receiver | Predicted Plant Noise Level | Limiting Design Criterion |
|---|---|---|
| 70 Camden Mews | $L_{Aeq}$ 6 dB | $L_{Aeq}$ 21 dB |
| 74 Camden Mews | $L_{Aeq}$ 17 dB | |
| 12 North Villas | $L_{Aeq}$ 14 dB | |

**Table 5.4 – Predicted plant noise level at most affected noise sensitive receiver**

## 5.4 Comparison to NR35 Curve

As can been seen from the following comparison in Table 5.5, the predicted noise levels at 1m from the most affected receivers are comfortably below the NR35 curve.

| Frequency (Hz) | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k |
|---|---|---|---|---|---|---|---|---|
| NR35 | 63 | 52 | 45 | 39 | 35 | 35 | 30 | 28 |
| Predicted Level @1m from 70 Camden Mews | 17 | 20 | 9 | -2 | -28 | -35 | -42 | -45 |
| Predicted Level @1m from 74 Camden Mews | 24 | 29 | 20 | 14 | -12 | -19 | -26 | -29 |
| Predicted Level @1m from 12 North Villas | 21 | 26 | 17 | 11 | -15 | -22 | -29 | -32 |

**Table 5.5 – Comparison of predicted noise levels against the NR35 criterion**

# 6. Conclusion

A baseline noise survey has been undertaken by Venta Acoustics to establish the background noise climate in the locality of 72 Camden Mews, London in support of a planning application for the proposed introduction of a new Air Source Heat Pump.

This has enabled noise emission limits to be set at the most affected noise sensitive receiver such that the proposed installation meets the requirements of Camden Council.

The cumulative noise emission levels from the proposed plant have been assessed to be compliant with the plant noise emission limits, with necessary mitigation measures specified.

The proposed scheme is not expected to have a significant adverse noise impact and the relevant planning requirements have been shown to be met.

**Ollie Brunt**


Camden Road
Camden Park Rd
Noise monitoring location
Proposed New Plant Location
Camden Mews
North Villas
Most Affected Receivers

72 Camden Mews, London

Environmental Noise Time History: 1

Rear

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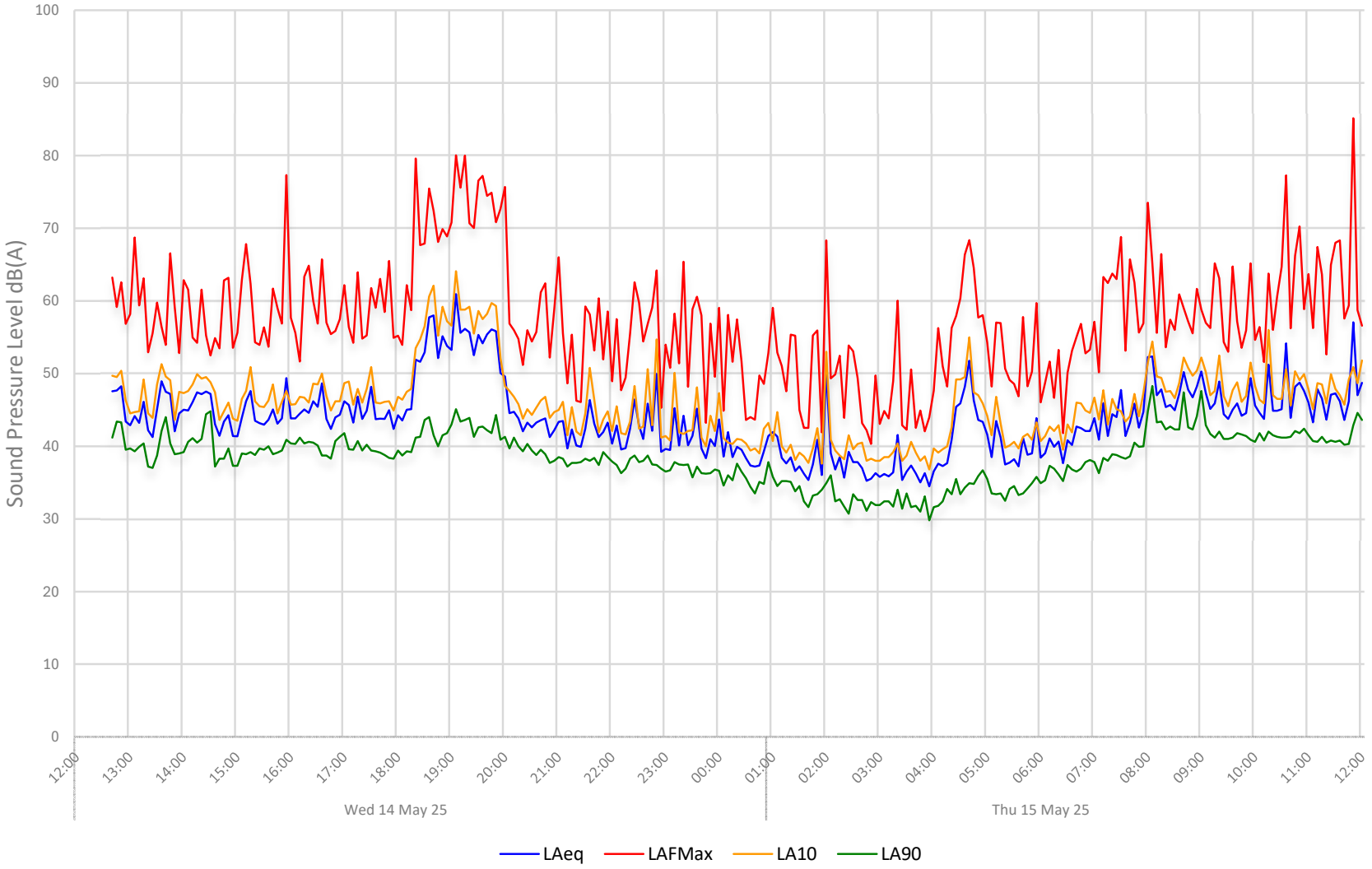
Figure VA5899/TH1



72 Camden Mews, London

Environmental Noise Time History: 2

Rear

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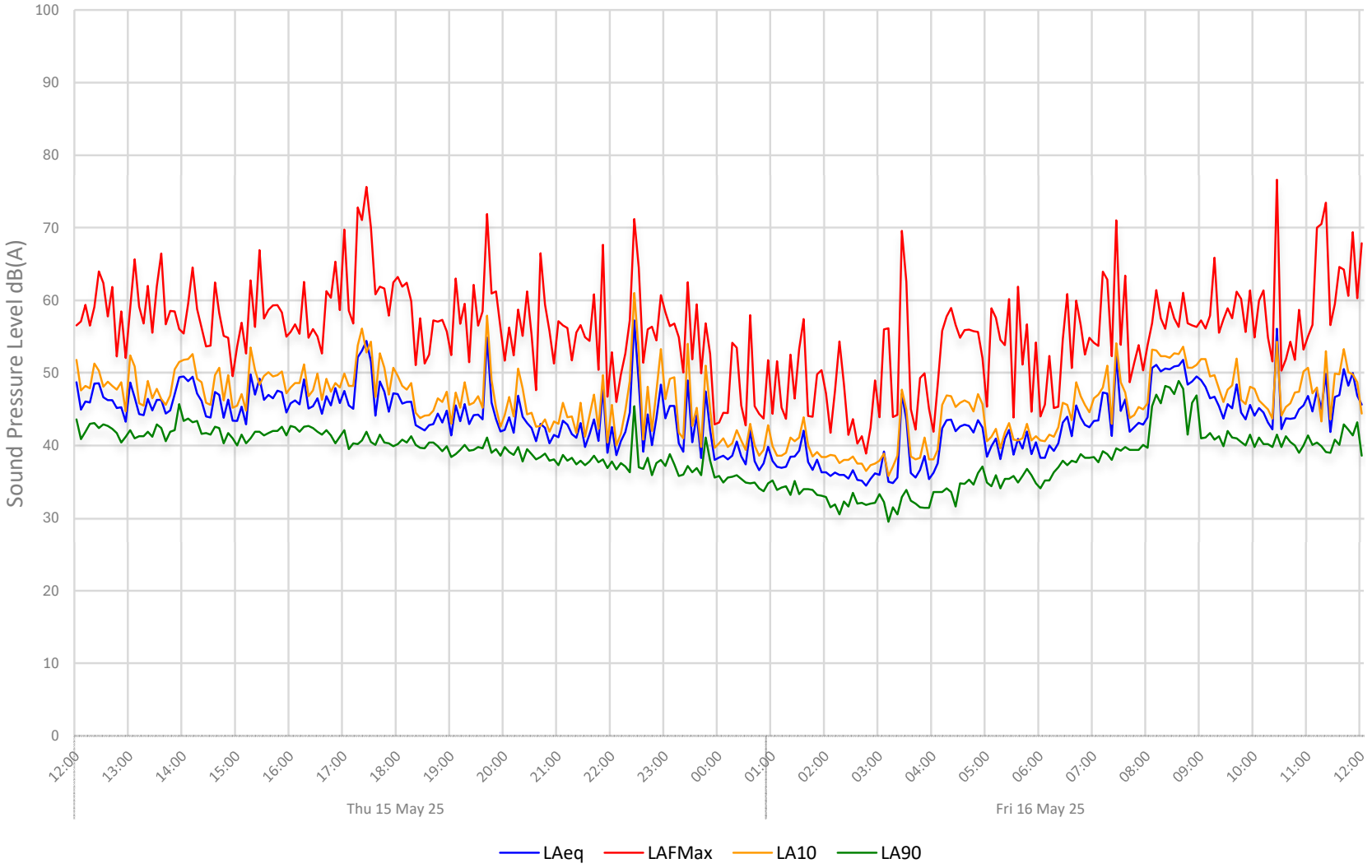
Figure VA5899/TH2



72 Camden Mews, London

Environmental Noise Time History: 3

Rear

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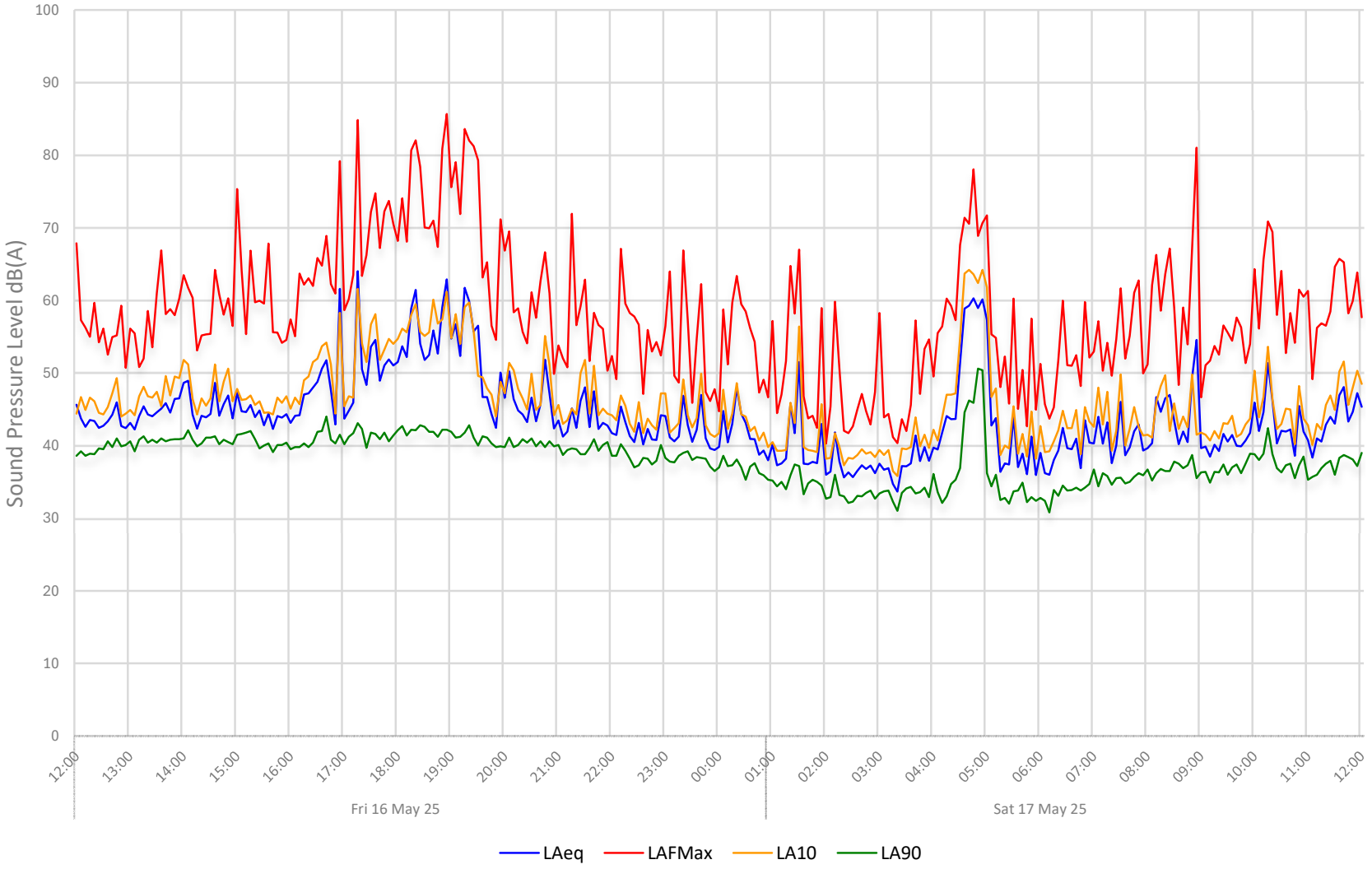
Figure VA5899/TH3



72 Camden Mews, London

Environmental Noise Time History: 4

Rear

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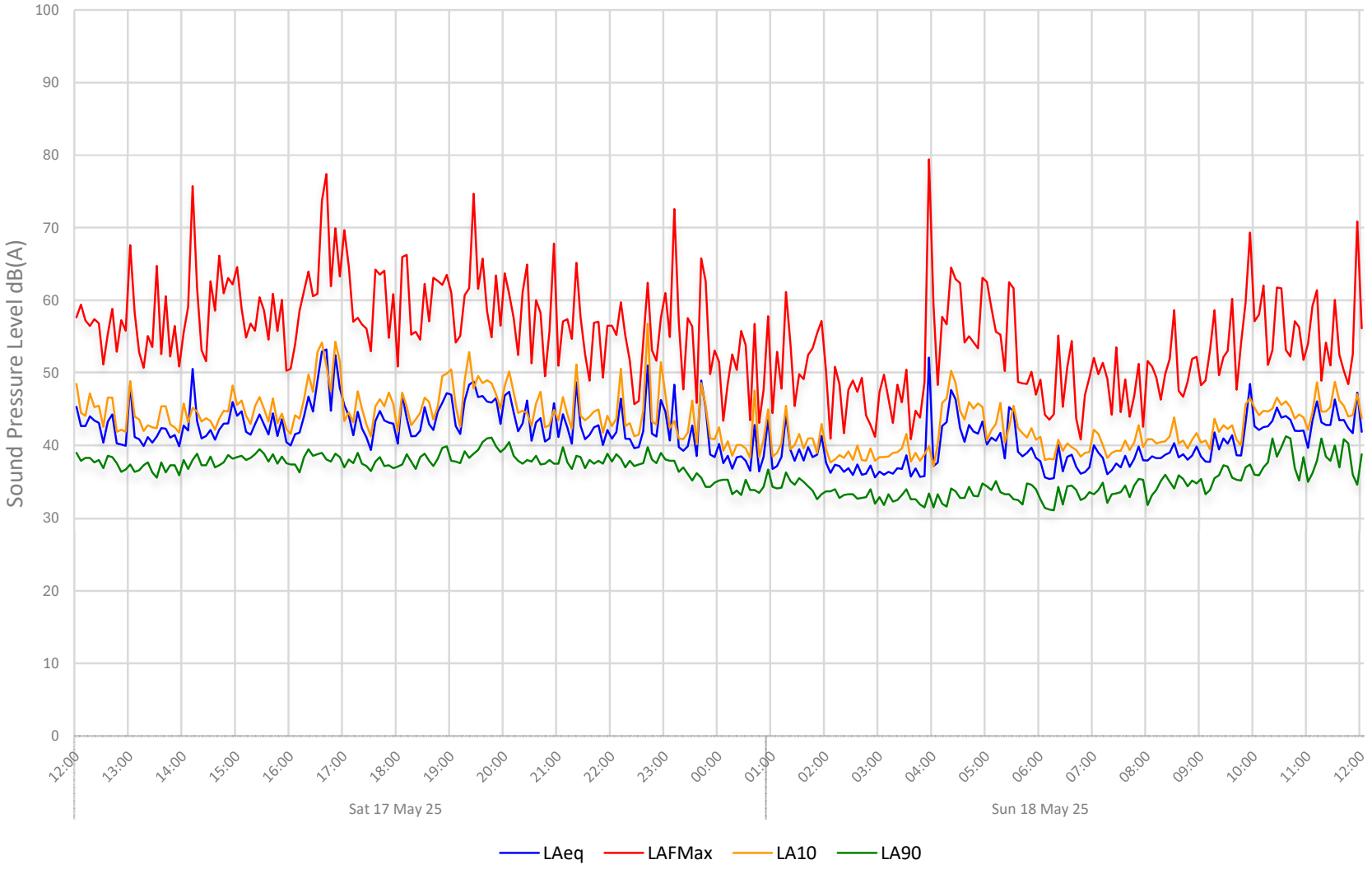
Figure VA5899/TH4



72 Camden Mews, London

Environmental Noise Time History: 5

Rear

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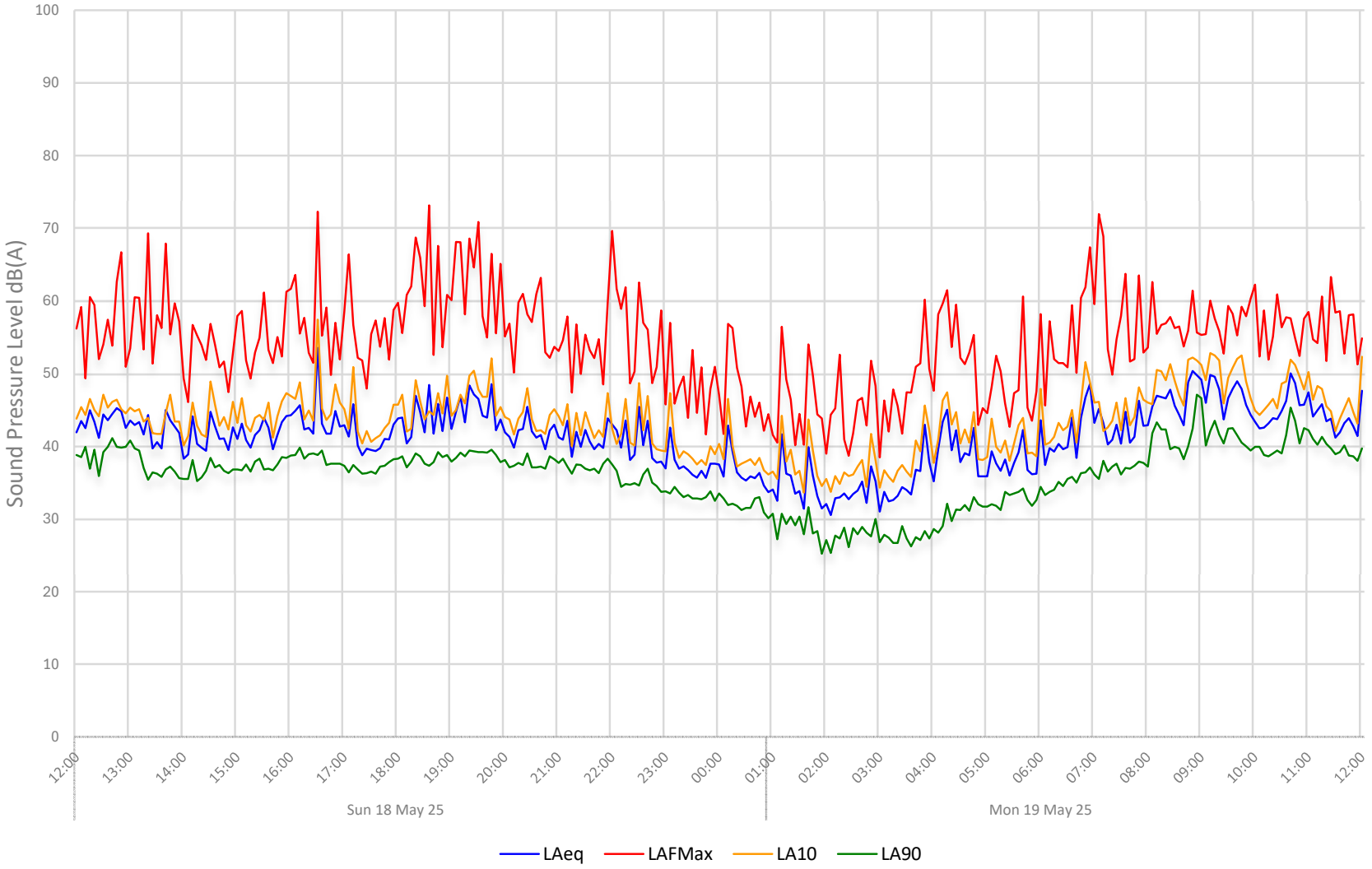
Figure VA5899/TH5



# APPENDIX A

Acoustic Terminology & Human Response to Broadband Sound

## 1.1 Acoustic Terminology

The human impact of sounds is dependent upon many complex interrelated factors such as 'loudness', its frequency (or pitch) and variation in level. In order to have some objective measure of the annoyance, scales have been derived to allow for these subjective factors.

| | |
|---|---|
| **Sound** | Vibrations propagating through a medium (air, water, etc.) that are detectable by the auditory system. |
| **Noise** | Sound that is unwanted by or disturbing to the perceiver. |
| **Frequency** | The rate per second of vibration constituting a wave, measured in Hertz (Hz), where 1Hz = 1 vibration cycle per second. The human hearing can generally detect sound having frequencies in the range 20Hz to 20kHz. Frequency corresponds to the perception of 'pitch', with low frequencies producing low 'notes' and higher frequencies producing high 'notes'. |
| **dB(A):** | Human hearing is more susceptible to mid-frequency sounds than those at high and low frequencies. To take account of this in measurements and predictions, the 'A' weighting scale is used so that the level of sound corresponds roughly to the level as it is typically discerned by humans. The measured or calculated 'A' weighted sound level is designated as dB(A) or $L_A$. |
| **$L_{eq}$ :** | A notional steady sound level which, over a stated period of time, would contain the same amount of acoustical energy as the actual, fluctuating sound measured over that period (e.g. 8 hour, 1 hour, etc).<br>The concept of $L_{eq}$ (equivalent continuous sound level) has primarily been used in assessing noise from industry, although its use is becoming more widespread in defining many other types of sounds, such as from amplified music and environmental sources such as aircraft and construction.<br>Because $L_{eq}$ is effectively a summation of a number of events, it does not in itself limit the magnitude of any individual event, and this is frequently used in conjunction with an absolute sound limit. |
| **$L_{10}$ & $L_{90}$ :** | Statistical $L_n$ indices are used to describe the level and the degree of fluctuation of non-steady sound. The term refers to the level exceeded for n% of the time. Hence, $L_{10}$ is the level exceeded for 10% of the time and as such can be regarded as a typical maximum level. Similarly, $L_{90}$ is the typical minimum level and is often used to describe background noise.<br>It is common practice to use the $L_{10}$ index to describe noise from traffic as, being a high average, it takes into account the increased annoyance that results from the non-steady nature of traffic flow. |
| **$L_{max}$ :** | The maximum sound pressure level recorded over a given period. $L_{max}$ is sometimes used in assessing environmental noise, where occasional loud events occur which might not be adequately represented by a time-averaged $L_{eq}$ value. |
| **R** | *Sound Reduction Index.* Effectively the *Level Difference* of a building element when measured in an accredited laboratory test suite in accordance with the procedures laid down in BS EN ISO 10140-2:2010 and corrected for its size and the reverberant characteristics of the receive room. |
| **D** | The sound insulation performance of a construction is described in terms of the difference in sound level on either side of the construction in the presence of a sound source on one side and the reverberant characteristics of the adjoining 'receive' space. *D* is the arithmetic *Level Difference* in decibels between the source and receive sound levels when filtered into frequency bands. |
| **$D_{nT}$** | *Weighted Standardised Level Difference.* As defined in BS EN ISO 717-1, representing the *Weighted Level Difference*, when standardised for reference receiving room reverberant characteristics. |
| **$D_{n,e}$** | Normalised sound insulation of small building elements of fixed dimensions, such as vents, measured in an accredited laboratory test suite in accordance with the procedures laid down in BS EN ISO 10140-2:2010. |
| **$D_{n,f}$** | Flanking sound insulation of lightweight elements, such as curtain wall mullions, measured in an accredited laboratory test suite in accordance with the procedures laid down in ISO 10848-2:2006 |

| | |
|---|---|
| **$R_w$ $D_w$ $D_{nT,w}$ $D_{n,e,w}$ $D_{n,f,w}$** | Value of parameter, determined as above, but weighted in accordance with the procedures laid down in BS EN ISO 717-1 to provide a single-figure value. |
| **C, $C_{tr}$** | Spectral adaptation terms to be added to a single number quantity such as $D_{nT,w}$, to take account of the sound insulation within frequency ranges of particular interest. |
| **$L'_{nT,w}$** | *Weighted Standardised Impact Sound Pressure Level* as defined in BS EN ISO 717-2, representing the level of sound pressure when measured within a space where the floor above is under excitation from a calibrated tapping machine, standardised for the receiving room reverberant characteristics. |
| **$\Delta L_w$** | Change in impact sound pressure level when a floor is fitted with a 'soft' or resilient covering, as measured in an accredited laboratory test suite in accordance with the procedures laid down in BS EN ISO 10140-3:2010. |

## 1.2 Octave Band Frequencies

In order to determine the way in which the energy of sound is distributed across the frequency range, the International Standards Organisation has agreed on "preferred" bands of frequency for sound measurement and analysis. The widest and most commonly used band for frequency measurement and analysis is the Octave Band. In these bands, the upper frequency limit is twice the lower frequency limit, with the band being described by its "centre frequency" which is the average (geometric mean) of the upper and lower limits, e.g. 250 Hz octave band extends from 176 Hz to 353 Hz. The most commonly used octave bands are:

| Octave Band Centre Frequency Hz | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 |
|---|---|---|---|---|---|---|---|---|

## 1.3 Human Perception of Broadband Noise

Because of the logarithmic nature of the decibel scale, it should be borne in mind that sound levels in dB(A) do not have a simple linear relationship. For example, 100dB(A) sound level is not twice as loud as 50dB(A). It has been found experimentally that changes in the average level of fluctuating sound, such as from traffic, need to be of the order of 3dB before becoming definitely perceptible to the human ear. Data from other experiments have indicated that a change in sound level of 10dB is perceived by the average listener as a doubling or halving of loudness. Using this information, a guide to the subjective interpretation of changes in environmental sound level can be given.

| Change in Sound Level dB | Subjective Impression | Human Response |
|---|---|---|
| 0 to 2 | Imperceptible change in loudness | Marginal |
| 3 to 5 | Perceptible change in loudness | Noticeable |
| 6 to 10 | Up to a doubling or halving of loudness | Significant |
| 11 to 15 | More than a doubling or halving of loudness | Substantial |
| 16 to 20 | Up to a quadrupling or quartering of loudness | Substantial |
| 21 or more | More than a quadrupling or quartering of loudness | Very Substantial |

## 1.4 Earth Bunds and Barriers - Effective Screen Height

When considering the reduction in sound level of a source provided by a barrier, it is necessary to establish the "effective screen height". For example if a tall barrier exists between a sound source and a listener, with the barrier close to the listener, the listener will perceive the sound as being

louder if he climbs up a ladder (and is closer to the top of the barrier) than if he were standing at ground level. Equally if he sat on the ground the sound would seem quieter than if he were standing. This is explained by the fact that the "effective screen height" is changing with the three cases above. In general, the greater the effective screen height, the greater the perceived reduction in sound level.

Similarly, the attenuation provided by a barrier will be greater where it is aligned close to either the source or the listener than where the barrier is midway between the two.

# APPENDIX B

## VA5899 - 72 Camden Mews, London

## Noise Impact Assessment

### Assessment - to rear of 70 Camden Mews

| | | 63 Hz | 125 Hz | 250 Hz | 500 Hz | 1 kHz | 2 kHz | 4 kHz | 8 kHz | dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|
| Source Noise Level | Lw | 55 | 62 | 59 | 52 | 43 | 38 | 31 | 29 | **54** |
| Radiation geometry | | -5 | -5 | -5 | 5 | -5 | -5 | -5 | -5 | |
| Enclosure insertion loss | | -10 | -12 | -18 | -27 | -34 | -36 | -36 | -37 | |
| Distance Loss | To 5m | -14 | -14 | -14 | -14 | -14 | -14 | -14 | -14 | |
| Building edge screening | | -9 | -11 | -13 | -18 | -18 | -18 | -18 | -18 | |
| **Level at receiver** | | **17** | **20** | **9** | **-2** | **-28** | **-35** | **-42** | **-45** | **6** |

### Assessment - to rear of 12 North Villas

| | | 63 Hz | 125 Hz | 250 Hz | 500 Hz | 1 kHz | 2 kHz | 4 kHz | 8 kHz | dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|
| Source Noise Level | Lw | 55 | 62 | 59 | 52 | 43 | 38 | 31 | 29 | **54** |
| Radiation geometry | | -5 | -5 | -5 | 5 | -5 | -5 | -5 | -5 | |
| Enclosure insertion loss | | -10 | -12 | -18 | -27 | -34 | -36 | -36 | -37 | |
| Distance Loss | To 9m | -19 | -19 | -19 | -19 | -19 | -19 | -19 | -19 | |
| **Level at receiver** | | **21** | **26** | **17** | **11** | **-15** | **-22** | **-29** | **-32** | **14** |

### Assessment - to rear of 74 Camden Mews

| | | 63 Hz | 125 Hz | 250 Hz | 500 Hz | 1 kHz | 2 kHz | 4 kHz | 8 kHz | dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|
| Source Noise Level | Lw | 55 | 62 | 59 | 52 | 43 | 38 | 31 | 29 | **54** |
| Radiation geometry | | -5 | -5 | -5 | 5 | -5 | -5 | -5 | -5 | |
| Enclosure insertion loss | | -10 | -12 | -18 | -27 | -34 | -36 | -36 | -37 | |
| Distance Loss | To 6m | -16 | -16 | -16 | -16 | -16 | -16 | -16 | -16 | |
| **Level at receiver** | | **24** | **29** | **20** | **14** | **-12** | **-19** | **-26** | **-29** | **17** |