# REPORT

## 34 Glenhurst Avenue, NW5 1PS

## Noise Impact Assessment

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# 1.0 Introduction

Clear Acoustic Design has been appointed to carry out a noise impact assessment in relation to the proposed mechanical plant installation at 34 Glenhurst Avenue, London, NW5 1PS. Proposals are for the installation of 1 external air source heat pump (ASHP). The unit is to be located at the rear of the existing premises.

The local planning authority has requested a noise impact assessment in order to safeguard the amenity of the surrounding receptors. The noise impact assessment is in line with BS 4142: 2014 + A1: 2019 *Methods for Rating and Assessing Industrial and Commercial Sound*. These criteria are seen to be appropriate in assessing and mitigating noise impact from this source.

## 1.1 Local Authority Requirements

A review of local planning policy has been undertaken. London Borough of Camden Council do not provide a specific limit for plant noise in relation to the existing background noise level. It is however stated that the noise impact assessment should include the following information;

> *The existing background noise levels measured over a 24 hour period,*
> *Any proposed measures to reduce noise,*
> *The system manufacturers specification of the proposed equipment to be installed,*
> *Details of the method used to compile the report and examples of the calculation.*

Background noise levels are seen to be moderate during the day, and low during the night. BS 4142 states that in some cases, the absolute level of noise is seen to be more relevant than a comparison to background noise levels.

It is proposed to limit the rating level of the proposed ASHP to 26 dB $L_{A,r,T}$. Rating levels of **≤** 30 dB are widely accepted to negate the risk of adverse noise impact. For this site, this will be 11 dB below the day time background noise level, and equal to the night time background noise level at the worst affected receptor (NSR2).

This is seen to be acceptable, as at 11 dB below the background noise level during the day, this broadband noise source will not be audible at the receptor locations. The proposed façade rating level of 26 dB $L_{A,r,T}$ is also seen to be totally acceptable in terms of noise ingress through an open window. Taking a standard 15 dB attenuation for a partially open window, this would equate to below NR10 within the affected dwellings. NR10 is widely accepted to relate to inaudibility and as such this is seen to be the most robust outcome for bedrooms at night.

Given that the outcome is seen to relate to inaudibility at the receptor locations, this is seen to equate to the No Observed Effect Level (NOEL) under national planning policy.

# 2.0 Environmental Noise Survey

In order to assess the noise impact of the proposed mechanical plant installation, an environmental noise survey has been undertaken by Clear Acoustic Design at a location representative of the nearest noise sensitive receptors (NSR1 and NSR2). Photographs of the noise survey location are provided in Appendix B, Figure B.1.

The receptor locations are taken to be the residential facades associated with the adjacent residential dwellings on Glenhurst Avenue. NSR1 is taken to be 36 Glenhurst Avenue. The ASHP is to be placed at the boundary to this receptor, and is screened from all windows. NSR2 is taken to be 32 Glenhurst Avenue. The ASHP is located at a larger distance to this façade, but is not screened.

The environmental noise survey has provided background noise levels, which will form the basis of the assessment in line with BS 4142. Ambient and background noise levels were measured between 24/01/23 and 25/01/23 using a single fixed noise monitor (referred to as F1).

## 2.1 Measurement Equipment and Environmental Conditions

The weather was witnessed to be overcast and dry for the duration of the survey with light wind speeds. The following measurement equipment was used for the survey.

| Equipment | Serial Number | Calibration Date |
|---|---|---|
| Casella CEL-633C Type 1 Sound Level Meter | 2145374 | 18/02/22 |
| Casella CEL-495 Preamplifier | 002436 | 18/02/22 |
| B&K 4189 Microphone | 2529821 | 18/02/22 |
| Casella CEL-120-1 Calibrator | 113251 | 18/02/22 |

**Table 2.1 Measuring Equipment used for Survey**

## 2.2 Fixed Noise Monitoring Graph – F1

Figure 2.1 below provides a graph of the measured noise levels at Location F1. The ambient ($L_{Aeq}$) and background ($L_{A90}$) noise levels are shown.

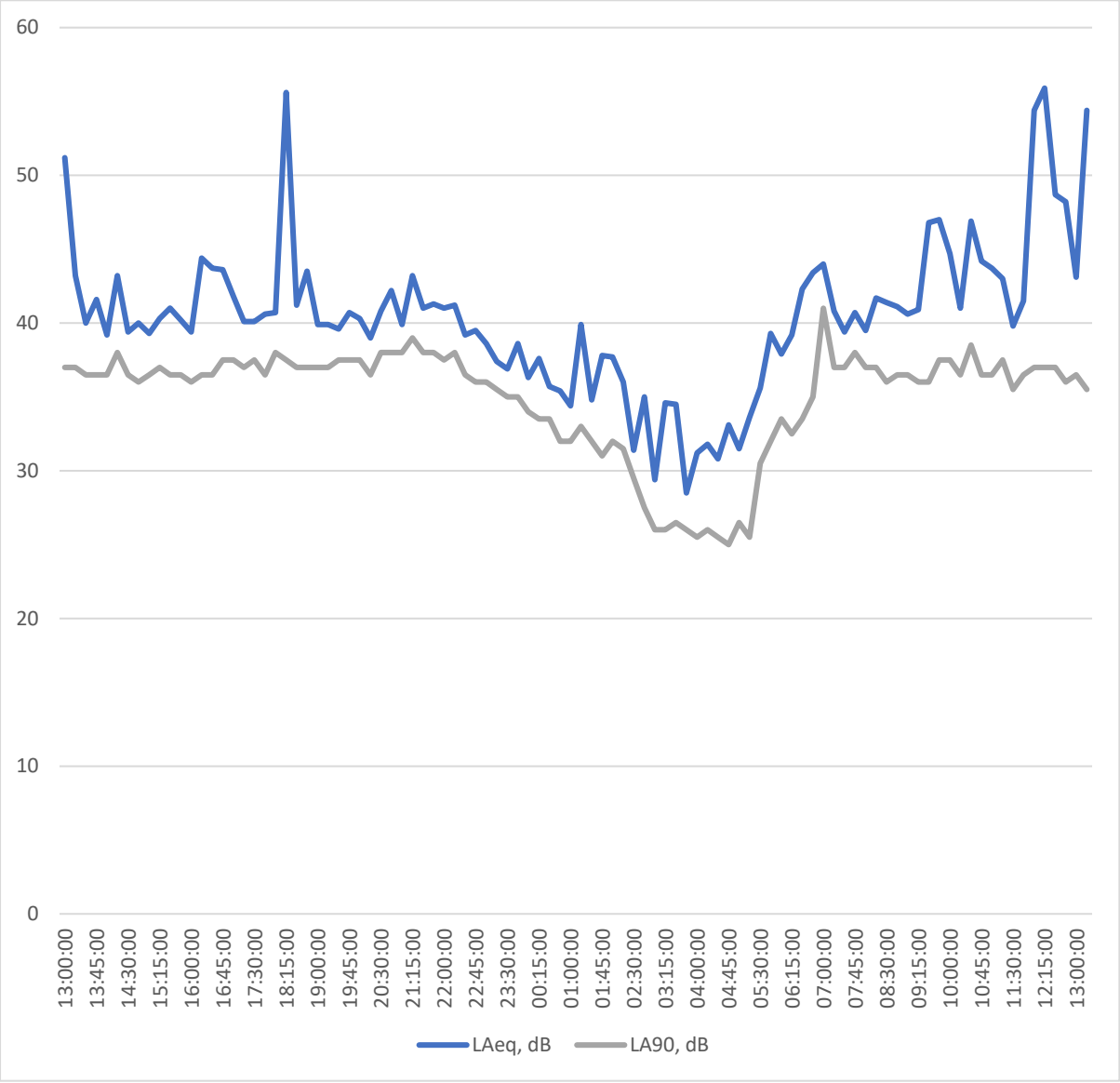


**Figure 2.1 Long Term Measurement Graph – F1**

### 2.2.1 Assessment Background Noise Level

In order to conduct an assessment in line with BS 4142: 2014, it is necessary to extrapolate representative background noise levels from the long term survey data. The proposed mechanical plant will operate during both day and night. The background noise levels which will form the basis of the assessment is presented in Table 2.2 below.

| Assessment Background Noise Level, $L_{A90}$ dB, DAY | Assessment Background Noise Level, $L_{A90}$ dB, NIGHT |
|---|---|
| 37 | 26 |

**Table 2.2: Assessment Background Noise Level**

# 3.0 Noise Impact Assessment

## 3.1 Noise Sources

The proposed external installation will be comprised of 1 external ASHP. The proposed unit is from *Samsung.* The unit has a sound power level of 60 dBA.

The sound power levels which have formed the basis of the assessment are presented in Table 3.1 below and are based on the manufacturer datasheet (typical spectrum assumed). The proposed unit is not seen to be tonal nor impulsive in nature.

| Type | 125 Hz | 250 Hz | 500 Hz | 1 KHz | 2 KHz | 4 KHz | dBA |
|---|---|---|---|---|---|---|---|
| EHS Mono HT Quiet, R32 14.0 Kw | 66 | 61 | 58 | 53 | 47 | 50 | 60 |

**Table 3.1: Noise Source, Sound Power Levels, dB**

## 3.2 Noise Mitigation and Assessment Outcome

In order to reduce noise levels to the proposed limit, it will be necessary to provide an acoustically rated enclosure to house the ASHP. Table 3.2 below provides the minimum insertion loss values which will be applicable to the louvres of the enclosure. These values must therefore be met when selecting an appropriate system. The enclosure is to be supplied and installed by others, based on this specification.

| Type | 125 Hz | 250 Hz | 500 Hz | 1 KHz | 2 KHz | 4 KHz |
|---|---|---|---|---|---|---|
| Enclosure | 6 | 8 | 15 | 14 | 11 | 11 |

**Table 3.2: Enclosure, Minimum Insertion Loss, dB**

In order to demonstrate compliance with the aforementioned rating level, Table 3.3 below provides an assessment in line with BS 4142: 2014 + A1: 2019, taking the proposed mitigation in to account. Supporting calculations are provided in Appendix A, Figure A.1.

| Receptor | Time Period | Specific Noise Level, $L_{As,T}$ dB | Acoustic Feature Correction | Rating Noise Level, $L_{Ar,T}$ dB | Background Noise Level, $L_{A90}$ dB | Assessment Outcome |
|---|---|---|---|---|---|---|
| NSR 1 | DAY | 23 | - | 23 | 37 | **- 14 dB** |
| | NIGHT | | | | 26 | **- 3 dB** |
| NSR 2 | DAY | 26 | - | 26 | 37 | **- 11 dB** |
| | NIGHT | | | | 26 | **+ 0 dB** |

**Table 3.3: BS 4142 Assessment – Outcome, Mitigated**

# 4.0 Conclusion

Clear Acoustic Design has been appointed to carry out a noise impact assessment in relation to the proposed mechanical plant installation at 34 Glenhurst Avenue, London, NW5 1PS. Proposals are for the installation of 1 external air source heat pump (ASHP). The unit is to be located at the rear of the existing premises.

The noise impact assessment is in line with BS 4142: 2014 + A1: 2019 *Methods for Rating and Assessing Industrial and Commercial Sound*. These criteria are seen to be appropriate in assessing and mitigating noise impact from this source. It is proposed to limit noise emissions from the ASHP to an absolute rating level of 26 dB $L_{A,r,T}$. This is more than 10 dB below the existing background noise level during the day, and equal to the background noise level during the night. Through a partially open window, the calculated rating level will be below NR10. This equates to inaudibility. This is therefore seen to be the No Observed Effect Level (NOEL) under national planning policy.

As can be seen in Table 3.3 above, with the inclusion of the proposed mitigation – Noise emissions from the mechanical plant installation will be in line with the proposed rating level. It will be necessary to provide an acoustically rated enclosure to house the ASHP. The minimum insertion loss values that must be met by the enclosure are provided in Table 3.2. Supporting Calculations are provided in Appendix A.

# Appendix A – Specific Noise Level Calculation

| Noise Emission Calculation | | | 125 | 250 | 500 | 1000 | 2000 | 4000 | dB(A) |
|---|---|---|---|---|---|---|---|---|---|
| SWL Radiating from | ASHP | | 66 | 61 | 58 | 53 | 47 | 50 | 60 |
| Screening | | | 10 | 10 | 10 | 10 | 10 | 10 | |
| Louvre Losses | | | 6 | 8 | 15 | 14 | 11 | 11 | |
| Radiation Directivity | | 4 | *(1 = free space, 2 = hemispherical, 4 = 1/4-sphere, 8= 1/8 sphere)* | | | | | | |
| @ Distance (m) | | 3.8 | | | | | | | |
| SPL @ NSR1 | | | 33 | 26 | 16 | 12 | 9 | 12 | 23 |
| | | | | | | | | | |
| SWL Radiating from | ASHP | | 66 | 61 | 58 | 53 | 47 | 50 | 60 |
| Screening | | | 0 | 0 | 0 | 0 | 0 | 0 | |
| Louvre Losses | | | 6 | 8 | 15 | 14 | 11 | 11 | |
| Radiation Directivity | | 4 | *(1 = free space, 2 = hemispherical, 4 = 1/4-sphere, 8= 1/8 sphere)* | | | | | | |
| @ Distance (m) | | 7.6 | | | | | | | |
| SPL @ NSR2 | | | 37 | 30 | 20 | 16 | 13 | 16 | 26 |

**Figure A.1: Specific Noise Level Calculation**

# Appendix B – Noise Survey / Site Photographs

**Figure B.1: Noise Survey Photographs**