
PLANT NOISE ASSESSMENT



4 HIGHFIELDS GROVE

YEATES DESIGN LLP

OCTOBER 2016

PLANT NOISE ASSESSMENT HIGHFIELD'S GROVE PLANT ASSESSEMENT

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CONTENTS

1	INTRODUCTION	6
2	NOISE UNITS, POLICY AND CRITERIA	7
3	SITE DESCRIPTION	9
4	NOISE MEASUREMENTS	10
5	PLANT NOISE ASSESSMENT	12
6	CONCLUSIONS	13
7	REFERENCES	14

1 INTRODUCTION

In order to complete a planning application for the installation five new condenser units at 4 Highfields Grove, London, N6 6HN, Camden City Council requires consideration be given to atmospheric noise emissions from the proposed plant at the nearest neighbouring noise sensitive property.

Anderson Acoustics Ltd has been commissioned by Yeates design LLP to assess the current prevailing noise conditions at the site and ensure that noise from the installation is controlled in accordance with the local authority's noise policy.

Noise units, acoustic terminology and environmental noise criteria relevant to the assessment have been presented and briefly discussed in Section 2 of this report.

A brief description of the site and proposed plant installation is given in Section 3.

The methodology and results of an environmental noise survey undertaken at the site are given in Section 4.

Section 5 provides an assessment of the proposed plant noise levels against the environmental noise survey results.

The report is summarised in Section 6.

2 NOISE UNITS, POLICY AND CRITERIA

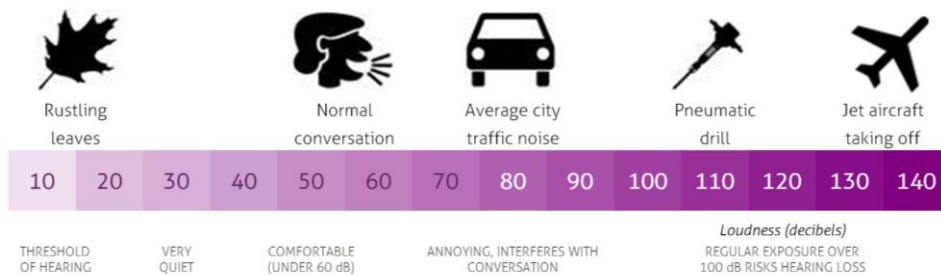
2.1 Noise Units

There is a million to one ratio between the threshold of hearing and the highest tolerable sound pressure. Noise is therefore measured using a logarithmic scale, to account for this wide range, called the decibel (dB). Noise is defined as unwanted sound and the range of audible sound varies from around 0 dB to 140 dB.

The human ear is capable of detecting sound over a range of frequencies from around 20 Hz to 20 kHz, however its response varies depending on the frequency and is most sensitive to sounds in the mid frequency range of 1 kHz to 5 kHz. Instrumentation used to measure noise is therefore weighted across the frequency bands to represent the sensitivity of the ear. This is called 'A weighting' and is represented as dB(A).

It is generally accepted that under normal conditions humans are capable of detecting changes in steady noise levels of 3 dB, whilst a change of 10 dB is perceived as a doubling or halving of the noise level. An indication of the range of noise levels commonly found in the environment is given below.

Figure 2.1: Typical noise levels



A number of different indices are used to describe the fluctuations in noise level over certain time periods. The main indices include:

- L_{A90,T}** This is the noise level exceeded for 90% of the measurement period and provides a measurement of the quieter 'lull' periods in between noise events. It is often referred to as the background noise level.
- L_{Aeq,T}** This is the "equivalent continuous A weighted sound pressure level" and is the level of a notional steady sound which has the same acoustic energy as the fluctuating sound over a specified time period. It is often used for measuring all sources of noise in the environment, which can be referred to as the ambient noise.
- L_{Amax,F}** This is the maximum sound pressure level measured in a given time period with the sound level meter set to 'fast' response.

Reference is often made to acoustic measurements being undertaken in 'free-field' or 'façade' locations. Free-field measurements represent a location away from vertical reflecting surfaces, normally by at least 3.5 metres.

A façade measurement is undertaken, or calculated to a position 1 metre from an external façade and a correction of up to 3 dB can be applied to account for the sound reflected from the façade. This latter position is often used when assessing the impact of external noise affecting residents inside properties.

2.2 Noise Policy

2.2.1 Noise Policy Statement for England

The Noise Policy Statement for England (NPSE) [1] was published on 15 March 2010. It sets out the long term vision of the Government's noise policy, which is to promote good health and a good quality of life through the management of noise within the context of sustainable development.

The NPSE sets out the following aims:

"Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- *avoid significant adverse impacts on health and quality of life;*
- *mitigate and minimise adverse impacts on health and quality of life; and*
- *where possible, contribute to the improvement of health and quality of life."*

2.2.2 National Planning Policy Framework

The National Planning Policy Framework (NPPF) [2] was published on 27 March 2012. Along with the introduction of this document, a number of detailed planning policy guidance notes were withdrawn, including PPG24, on planning and noise.

The NPPF sets out how the Government's planning policies should be applied. In terms of the detail of policies on environmental issues such as noise, the intention is for Local Planning Authorities to set their own guidance. This will form part of or be referred to in the relevant local plan.

2.3 Local Authority Requirements

2.3.1 Camden Council Policy

Noise emissions from plant installations are subject to Camden Council's local development framework. Table E in The Camden Development Policies document of 2010 specifies "Noise levels from plant and machinery at which planning permission will not be granted":

Noise description and location of measurement	Period	Time	Noise level
Noise at 1 metre external to a sensitive façade	Day, evening and night	0000-2400	5dB(A) <LA90
Noise that has a distinguishable discrete continuous note (whine, hiss, screech, hum) at 1 metre external to a sensitive façade.	Day, evening and night	0000-2400	10dB(A) <LA90
Noise that has distinct impulses (bangs, clicks, clatters, thumps) at 1 metre external to a sensitive façade.	Day, evening and night	0000-2400	10dB(A) <LA90
Noise at 1 metre external to sensitive façade where LA90>60dB	Day, evening and night	0000-2400	55dB _{LAeq}

3 SITE DESCRIPTION

It is understood that five new condenser units are to be installed on the roof at 4 Highfield's Grove, London.

The units to be installed are five Mitsubishi MXZ-4D72VA. Spectral data for the unit is not available, and are therefore assumed to be non-tonal in character.

The plant has the potential to operate during 24 hours 7 days a week.

During the site visit background noise was noted by nearby construction sites. These sites are understood to work only during daytime hours.

The nearest noise sensitive windows belong to a neighbouring residential property.

Figure 4.2: Plant location and nearest noise sensitive window



4 NOISE MEASUREMENTS

4.1 Continuous Noise Monitoring

Continuous unattended noise measurements were obtained over a 24 hour period to obtain background noise levels at the site.

The continuous monitoring of background noise levels was undertaken under facade conditions as shown in figure 4.1. This location is considered representative of the nearest noise sensitive property.

Figure 4.1: Noise monitoring location



Noise levels were measured using a Rion NL-52 precision integrating sound level meter. The microphone was fitted with a weatherproof windshield. The sound level meter was powered by dry cell batteries and stored inside a weatherproof security box.

Measurements were obtained using the 'F' time weighting and A-weighting frequency network. Fifteen-minute consecutive measurements of $L_{Aeq,T}$, $L_{Amax,T}$ and $L_{A90,T}$ noise levels were obtained between approximately 10:45 hrs Thursday 4th and 10:45 hrs on Friday 5th August 2016.

The equipment was calibrated before and after the survey using a Rion NC-74 sound calibrator to generate a calibration level of 94.0 dB at 1 kHz. No significant calibration drifts were observed.

4.2 Weather Conditions

Weather conditions during the survey period have been obtained from internet sources www.wunderground.com (Weather station at Hampstead which indicates dry periods of light to moderate winds during the survey period). At the time of setting up and collecting the noise monitor, weather conditions were noted to be dry with clear skies.

It is considered that the weather conditions did not significantly adversely affect the noise measurements.

4.3 Noise Survey Results

The results of the continuous noise monitoring survey are presented in graphical form in Appendix A.

Table 4.1 summarises the relevant average L_{Aeq} and L_{A90} noise levels measured during the proposed hours of plant operation 00:00 to 24:00 Monday to Sunday.

Table 4.1: Noise survey results

Monitoring Period	Time period	$L_{Aeq,T}$	L_{A90}
Thursday 4 th of August / Friday 5 th of August	10:55 to 19:00	54	48
	19:00 to 23:00	49	41
	23:00 – 7:00	49	39
	7:00 – 10:55	52	44

The unattended noise survey results indicate ambient noise levels between 49 to 54 dB(A) $L_{Aeq,T}$ and a minimum average background noise level of 39 dB(A) L_{A90} during the proposed hours of plant operation.

5 PLANT NOISE ASSESSMENT

5.1 Noise Limit

In line with Camden Councils requirements, combined noise emissions from the two condenser units will need to be controlled to 5 dB below the measured background level during proposed hours of operation.

The target noise limit is therefore 34 dB(A) at the nearest noise sensitive property.

5.2 Assessment

Calculations have been carried out based on manufacturer's noise data for the proposed Mitsubishi PUMY-P200YKM condenser units.

The calculations presented below show the combined noise levels incident at the nearest noise sensitive window.

Table 5.1: Predicted noise level at the nearest noise sensitive window

Description	Noise levels dB(A)
Mitsubishi MXZ-4D72VA – Sound Pressure Level at 1m	53
Correction for 5 units - 10LOG(5)	7
Reflections	6
Screening (Roof)	-10
Distance Correction – 21 m- 20LOG(1/21)	-26
Total noise level at 1m from window	30
Target Level	34
Difference	-4

~~Our assessment has found that noise emissions from the proposed condenser units will meet Camden Councils noise policy requirements.~~

Our assessment has found that noise levels from the five condenser units at the nearest noise sensitive window will be 9 dB below the background noise level and 4 dB below the Camden Council criteria.

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6 CONCLUSIONS

Anderson Acoustics Ltd has undertaken an environmental noise assessment to assist in the planning application for the installation of five new condenser units at 4 Highfields Grove, London, N6 6HN.

A background noise survey has been undertaken and an assessment of plant noise emissions carried out to establish the likely noise level at the nearest noise sensitive windows.

As proposed, noise levels will meet the Camden Council requirement.

7 REFERENCES

- 1 Noise Policy Statement for England (NPSE). 15 March 2010
- 2 National Planning Policy Framework (NPPF). 27 March 2012
- 3 British Standard BS 4142:2014. Methods for rating and assessing industrial and commercial sound

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APPENDIX A

NOISE SURVEY RESULTS AND CALCULATIONS

Figure A1: Unattended Survey Results

