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29 TO 33 CHALK FARM ROAD, LONDON

PLANT NOISE ASSESSMENT

Technical Report: R8990-1 Rev 1

Date: 12th April 2021

For: Hallmark Property Group
46 Great Marlborough Street
London
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24 Acoustics Document Control Sheet

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CONTENTS **Page**

1.0 INTRODUCTION

1.1 24 Acoustics Ltd has been instructed by Hallmark Property Group to undertake an assessment of the potential impact of noise from a new kitchen extract fan and flue serving a commercial unit on the ground floor of 29 to 33 Chalk Farm Road, London.

1.2 This report presents the results of the assessment following background noise measurements undertaken between 16th and 23rd March 2021.

1.3 All sound pressure levels quoted in this report are in dB relative to 20 µPa. A glossary of the acoustic terminology used in this report is provided in Appendix A.

2.0 SITE DESCRIPTION

2.1 The property at 29 to 33 Chalk Farm Road comprises commercial units on the ground floor and student accommodation (The Stay Club) on upper floors. The proposed plant comprises a kitchen extract fan that will be located within the ground floor commercial unit and an external flue that terminates at roof level.

2.2 The fan will operate between 10:00 hours and midnight and in accordance with the permitted operational hours that have been previously agreed with Camden Council.

2.3 The nearest residential properties to the proposed plant are houses to the east on Hartland Road (numbers 1 to 7), approximately 20 metres from the proposed grille at roof level.

2.4 The noise measurements were undertaken during the national lockdown to control Covid-19 and considered worst-case with regard to the background noise levels. Local road traffic was the dominant sources of noise at the measurement location.

2.5 Figure 1 describes the site layout, measurement location and proposed plant location.

3.0 CRITERIA

NPPF and NPSE

3.1 The National Planning Policy Framework (NPPF) [Reference 1], revised in February 2019, states (paragraph 180) in relation to noise that planning policies and decisions should aim to:

- Mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;
- Identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.

3.2 The NPPF refers to the Noise Policy Statement for England (NPSE) [Reference 2] which is intended to apply to all forms of noise, including environmental noise, neighbour noise and neighbourhood noise. The NPSE sets out the Government's long-term vision to 'promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development' which is supported by the following aims.

- Avoid significant adverse impacts on health and quality of life;
- Mitigate and minimise adverse impacts on health and quality of life.

3.3 The NPSE defines the concept of a 'significant observed adverse effect level' (SOAEL) as 'the level above which significant adverse effects on health and quality of life occur'. The following guidance is provided within the NPSE:

> *"It is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times. It is acknowledged that further research is required to increase our understanding of what may constitute a significant adverse impact on health and quality of life from noise. However, not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available."*

3.4 The Planning Practice Guidance (PPG) [Reference 3] supports the NPPF with more specific planning guidance. The PPG reflects the NPSE and states that noise needs to be considered when new developments may create additional noise and when new developments would be sensitive to the prevailing acoustic environment. It also states that opportunities should be taken, where practicable, to achieve improvements to the acoustic environment. The PPG states that noise can over-ride other planning concerns but should not be considered in isolation from the other economic, social and environmental dimensions of the proposed development.

3.5 The PPG expands upon the concept of SOAEL (together with Lowest Observable Adverse Effect Level, LOAEL and No Observed Effect Level, NOEL) as introduced in the NPSE and provides a table of noise exposure hierarchy for use in noise impact assessments in the planning system.

3.6 None of the documents referred to above provide specific noise criteria. The following guidance document is considered appropriate (technically and objectively) to assess noise impact of the proposed services plant.

British Standard 4142:2014

3.7 BS 4142:2014 [Reference 4] provides a method for rating the effects of industrial and commercial sound on residential areas. The standard advocates a comparison between the typical measured L_{A90} background noise level and L_{Aeq} noise level from the source being considered. For rating purposes if the noise source is tonal, intermittent or otherwise distinctive in character, a rating correction should be applied.

3.8 The standard states that a difference between the rating level and the background level of around +10 dBA is an indication of a significant adverse impact, depending on the context and a difference of around +5 dBA is likely to be an indication of an adverse impact again depending on the context. Where the rating level does not exceed the background noise level, this is an indication of the specific sound source having a low impact (depending upon the context).

3.9 BS 4142 states that certain acoustic features can increase the significance of impact of that expected from a basic comparison between the specific sound level and the background sound level. Where such features are present at the assessment location a character correction should be applied to the specific sound level to determine the rating level. The rating correction is determined based upon the impulsivity and tonality of the sound noise level.

Planning History

3.10 The development was granted planning approval in 2014 (application reference 2012/0974/P). During the planning process, 24 Acoustics measured the background noise levels at the undeveloped site and recommended suitable plant noise criteria (report reference R4038-2 Rev 1), as follows:

> 4.5 The results of the environmental survey showing the equivalent (dB $L_{Aeq,\ 15\ min}$) and background (dB $L_{A90,\ 15\ min}$) values are shown in graphical format in Figure B1 and summarised below.
>
> | Plant operation time | Lowest Level |
> |---|---|
> | 07:00 – 19:00 hours | 47 dB $L_{A90,\ 15\ min}$ |
> | 19:00 – 23:00 hours | 54 dB $L_{A90,\ 15\ min}$ |
> | 23:00 – 07:00 hours | 42 dB $L_{A90,\ 15\ min}$ |
>
> Assessment
>
> 4.6 Based upon the requirements of the Local Planning Authority, noise from the plant should not exceed the following levels as measured at 1m from the window of the nearest habitable residential room:
>
> | Plant operation time | Noise Limit |
> |---|---|
> | 07:00 – 19:00 hours | 42 dB $L_{A90,\ 15\ min}$ |
> | 19:00 – 23:00 hours | 49 dB $L_{A90,\ 15\ min}$ |
> | 23:00 – 07:00 hours | 37 dB $L_{A90,\ 15\ min}$ |
>
> * Nb, if noise from the plant is tonal in nature, the above values would reduce by 5 dB

3.11 Planning approval was granted subject to conditions. Planning condition 5 advises on the permitted operating hours for the ground floor commercial units:

- Monday to Thursday 10:00 to 23:30 hours
- Fridays and Saturdays 10:00 to 00:00 hours
- Sundays 11:00 to 22:30 hours

3.12 Condition 8 requires that full details of a scheme for ventilation, including manufacturers' specification, noise levels and attenuation be submitted to and approved by the Local Planning Authority.

3.13 Planning condition 10 confirms that plant noise levels at one metre from the sensitive façade shall be at least 5 dBA below the existing background level (L_{A90}). A 5 dB correction is applicable if the plant produces tonal or temporal characteristics.

3.14 It is proposed, therefore, that the new plant be designed and installed such that the noise rating level from the new plant does not exceed 5 dB below the typical background noise levels at the most affected private property.

3.15 24 Acoustics has undertaken new background noise measurements since it has been nine years since the original survey and the local noise conditions may have changed.

3.16 This approach is considered in line with the above planning history and Camden Council's requirements for new building services plant.

4.0 ENVIRONMENTAL NOISE SURVEY

Methodology

4.1 Background noise measurements were undertaken at the premises between 16th and 23rd March 2021. The equipment was sited on a terrace roof to the rear of the building. The measurement location is described in Figure 1 and noise conditions at this location are considered representative of those to the rear of the nearest properties on Hartland road.

4.2 The following equipment was used:

- Rion precision sound level meter Type NL-31
- B&K acoustic calibrator Type 4231

4.3 Noise measurements were undertaken in samples of 5 minutes in terms of the overall free-field A-weighted and octave-band L_{eq}, L_{90} and $L_{max,f}$ noise levels. Measurements were made in accordance with BS 7445:1991 "Description and measurement of environmental noise Part 2 - Acquisition of data pertinent to land use" [Reference 5].

4.4 The instrumentation's calibration was checked before and after the surveys in accordance with the manufacturer's instructions. No significant drift in calibration was recorded. Calibration of 24 Acoustics' equipment is traceable to National Standards. The instrumentation was fitted with an environmental weather shield during the surveys.

4.5 Weather conditions during the survey were variable with generally low wind speeds and are not considered to have significantly affected the typical background noise levels. The results of the background noise measurements are shown graphically in Appendix B.

Results and Maximum Plant Noise Levels

4.6 The typical measured background noise level was 40 dB $L_{A90,\ 15min}$ during the latest operating period (10:00 to midnight). 24 Acoustics determines the typical background level to be the average measurement for the period minus one standard deviation.

4.7 Noise from the proposed plant shall not exceed 35 dB L_{Aeq} outside the most affected residential property. If noise from the plant contains tones or temporal characteristics that are sufficiently perceptible at the receive location, a correction shall be applied in accordance with BS 4142.

5.0 PLANT NOISE ASSESSMENT

5.1 Manufacturer's octave band noise data has been provided for the following extract fan:

- AR 500E4 Sileo Axial Fan (1 no.) 64 dBA L_w

5.2 The atmospheric side of the extract fan shall be fitted with an inline attenuator placed directly after the fan (inside the building) and specified to provide the minimum insertion losses described in Table 1.

Insertion Loss (dB) per Octave Band Centre Frequency (Hz)							
63	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**
2	4	7	7	9	7	6	7

Table 1 - Minimum Atmospheric Silencer Insertion Loss (dB)

5.3 The most affected windows, which are closest to the grille, are to the rear of properties on Hartland Road at a distance of approximately 20 metres.

5.4 The external ductwork will be circular and downstream from the proposed attenuator and the contribution from duct break-out noise is considered negligible.

5.5 With corrections for distance and reflections, calculations have been undertaken to confirm the following maximum plant noise level outside properties on Hartland road:

- 20 dB $L_{Aeq,\ 1hour}$ during the operating periods (between 10:00 and midnight)

5.6 The new plant is not expected to produce any tones or temporal characteristics that would be perceptible at the nearest residential property.

5.7 The calculations demonstrate that noise levels from the proposed plant would achieve the established maximum noise levels and hence comply with Camden Council's requirements for new services plant.

6.0 CONCLUSIONS

6.1 24 Acoustics Ltd has been appointed by Hallmark Property Group to undertake a noise assessment for the proposed extract fan at 29 to 33 Chalk Farm Road, Camden.

6.2 Background noise measurements have been undertaken at the site to determine the prevailing background noise levels. A suitable noise criterion has been established with reference to the measured background noise levels and planning history for the development.

6.3 Calculations have been undertaken, based on the manufacturer's noise data and recommended mitigation measures (inline attenuation). The results demonstrate that noise from the proposed plant would achieve the established maximum noise levels.

REFERENCES

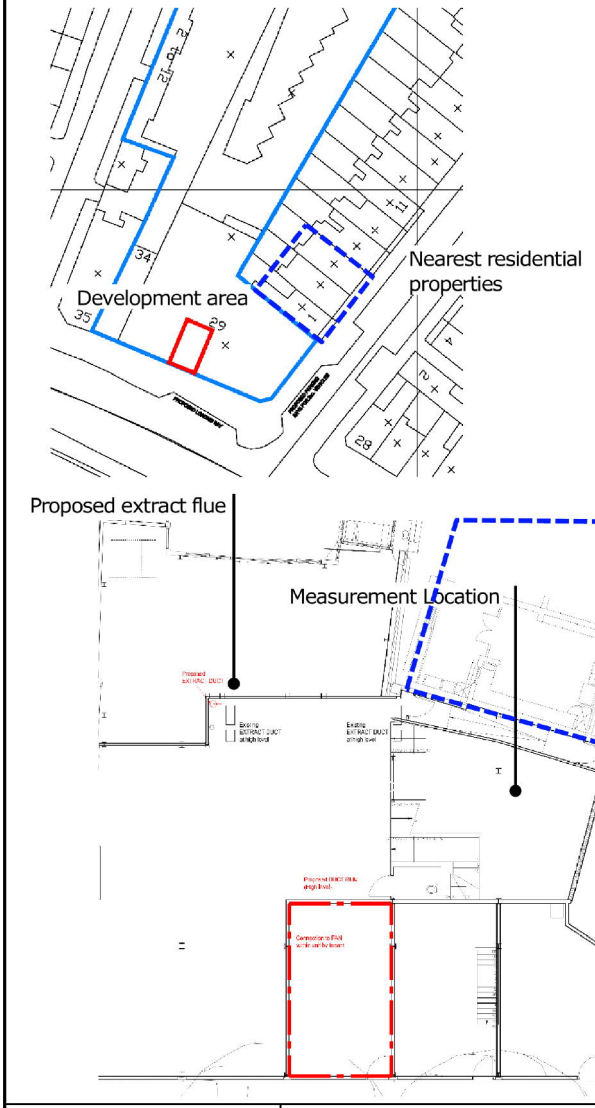
1. Department for Communities and Local Government. The National Planning Policy Framework (NPPF), 2019.

2. Noise Policy Statement for England, Defra, 2010.

3. Planning Practice Guidance, Department of Communities and Local Government, Revised July 2019.

4. British Standards Institution. British Standard 4142: 'Method for Rating and Assessing Industrial and Commercial Sound', 2014.

5. British Standards Institution. BS 7445: 'Acquisition of Data Pertinent to Land Use', 1991.



Project: 29 to 33 Chalk Farm Road	**Title:** Site plan showing measurement location, plant location and nearest residential properties	
DWG No: Figure 1	**Scale:** N.T.S.	**Rev**: -
Date: April 2021	**Drawn By:** NM	**Job No**: 8990

APPENDIX A – ACOUSTIC TERMINOLOGY

Noise is defined as unwanted sound. The range of audible sound is from 0 to 140 dB. The frequency response of the ear is usually taken to be around 18 Hz (number of oscillations per second) to 18000 Hz. The ear does not respond equally to different frequencies at the same level. It is more sensitive in the mid-frequency range than the lower and higher frequencies and because of this, the low and high frequency components of a sound are reduced in importance by applying a weighting (filtering) circuit to the noise measuring instrument. The weighting which is most widely used and which correlates best with subjective response to noise is the dBA weighting. This is an internationally accepted standard for noise measurements.

For variable sources, such as traffic, a difference of 3 dB is just distinguishable. In addition, a doubling of traffic flow will increase the overall noise by 3 dB. The 'loudness' of a noise is a purely subjective parameter, but it is generally accepted that an increase/ decrease of 10 dB corresponds to a doubling/ halving in perceived loudness.

External noise levels are rarely steady, but rise and fall according to activities within an area. In attempt to produce a figure that relates this variable noise level to subjective response, a number of noise indices have been developed. These include:

i) The L_{Amax} noise level

This is the maximum noise level recorded over the measurement period.

ii) The L_{Aeq} noise level

This is "equivalent continuous A-weighted sound pressure level, in decibels" and is defined in British Standard BS 7445 as the "value of the A-weighted sound pressure level of a continuous, steady sound that, within a specified time internal, T, has the same mean square sound pressure as a sound under consideration whose level varies with time".

It is a unit commonly used to describe construction noise and noise from industrial premises and is the most suitable unit for the description of other forms of environmental noise. In more straightforward terms, it is a measure of energy within the varying noise.

iii) The L_{A10} noise level

This is the noise level that is exceeded for 10% of the measurement period and gives an indication of the noisier levels. It is a unit that has been used over many years for the measurement and assessment of road traffic noise.

iv) The L_{A90} noise level

This is the noise level that is exceeded for 90% of the measurement period and gives an indication of the noise level during the quieter periods. It is often referred to as the background noise level and is used in the assessment of disturbance from industrial noise.

APPENDIX B – ENVIRONMENTAL NOISE MEASUREMENTS