29-35 Farringdon Road

ENVIRONMENTAL NOISE SURVEY
AND NOISE IMPACT ASSESSMENT
REPORT 20032/ENIA1

For :

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Revision No.	Date	Description
0	28/02/2014	First Issue

1.0 INTRODUCTION

A new residential development is proposed at the land to the rear of 29-35 Farringdon Road, London. The site is subject to noise from the surrounding roads and from aircraft passing overhead.

Hann Tucker Associates have therefore been commissioned to undertake a detailed environmental noise survey to determine the currently prevailing noise climate at the site. The results of the survey have been used to assess the suitability of the site for residential development.

This report presents the methodology and findings of our noise survey and assessment.

2.0 OBJECTIVES

To establish, by means of fully automated environmental noise monitoring, the existing A-weighted (dBA) L_{90}, L_{eq} and L_{max} environmental noise levels at selected accessible positions at the site.

Based upon the results of the noise survey data, guidance in the NPPF and the requirements of the Local Authority, to undertake a noise assessment to assess the suitability of the proposed development for residential use.

These objectives are as set out our letter dated 7 February 2014 and written instructions received on 18 February 2014.

3.0 SITE DESCRIPTION

3.1 Location

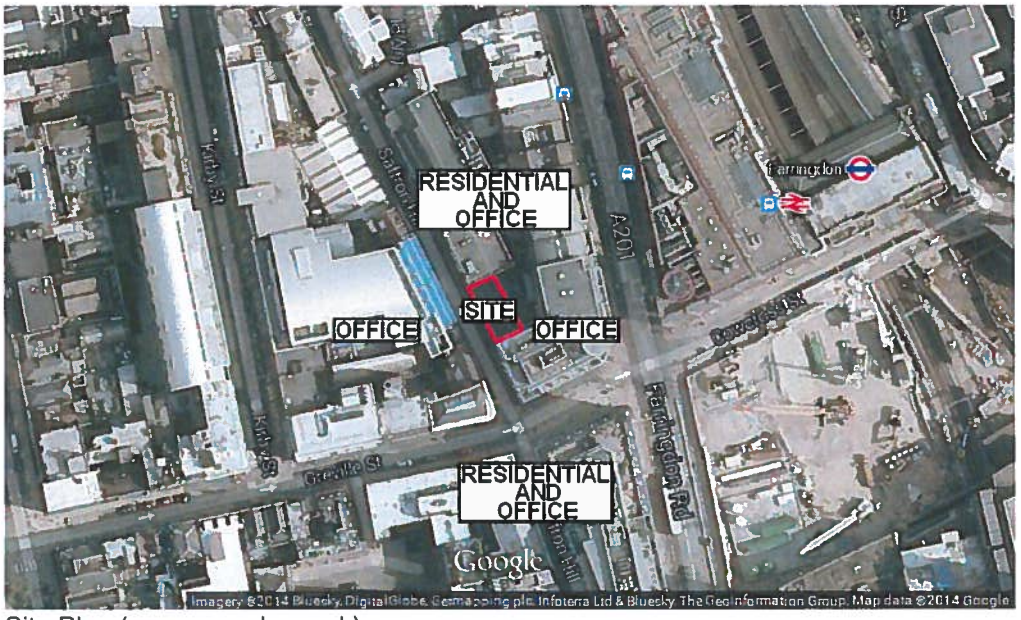
The site is located at the rear of 29-35 Farringdon Road and falls within Camden Council's jurisdiction. See Location Map below.

Location Map (maps.google.co.uk)

3.2 Description

The site is bound by 29-35 Farringdon Road to the east and south, an office building to the north and Saffron Hill to the west. The surrounding buildings are generally office and residential use, between three and seven storeys in height. The site currently consists of part of a car park, a bike storage area, a bin store and a plant area for 29-35 Farringdon Road. The proposed development is to be built over these areas at first floor level and above.

The main sources of noise at the site are considered to traffic on Farringdon Road and aircraft passing overhead. See Site Plan below.



Site Plan (maps.google.co.uk)

4.0 ACOUSTIC TERMINOLOGY

For an explanation of the acoustic terminology used in this report please refer to Appendix A enclosed.

5.0 METHODOLOGY

5.1 Procedure

Fully automated environmental noise monitoring was undertaken from approximately 16:00 hours on Monday 24 February 2014 to 16:00 hours on Tuesday 25 February 2014. Measurements were taken continuously of the A-weighted (dBA) L_{90}, L_{eq} and L_{max} sound pressure levels over 5 minute periods.

Due to the nature of the survey, i.e. unmanned, it is not possible to accurately comment on the weather conditions throughout the entire survey period. However at the beginning and end of the survey period the wind conditions were light and the sky was generally clear. We understand that generally throughout the survey period the weather conditions were breezy and overcast with some rain.

5.2 Measurement Position

The noise level measurements were undertaken at the north east corner of the site, by the boundaries with Saffron Lane to the east and the office to the north. The microphone was attached to a pole protruding up above the boundary wall of the site, at a height of approximately 2.5m above ground level. The microphone was considered to be in free field conditions. The main source of noise was considered to be traffic on the surrounding roads.

The position was selected in order to measure the typical noise levels incident upon the site for use in assessing it's suitability for residential use and is shown on the plan below.

Plan Showing Unmanned Measurement Position (maps.google.co.uk)

5.3 Instrumentation

The instrumentation used during the survey is presented in the Table below:

Description	Manufacturer	Type	Serial Number	Latest Verification
Type 1 Data Logging Sound Level Meter	Larson Davis	824	3533	LD calibration on 14/03/2013
Type 1 Calibrator	CAL200	3082	CAL200	LD calibration on 31/03/2013

The sound level meter, including the extension cable, was calibrated prior to and on completion of the survey. No significant change was found to have occurred (no more than 0.1 dB).

The sound level meter was located in an environmental case with the microphone connected to the sound level meter via an extension cable. The microphone was fitted with a Larson Davis windshield.

6.0 RESULTS

The results have been plotted on Time History Graph 20032/TH1.1 enclosed presenting the 5 minute A-weighted (dBA) L_{90}, L_{eq} and L_{max} levels at the measurement position throughout the duration of the survey.

7.0 DISCUSSION OF NOISE CLIMATE

Due to the nature of the survey, i.e. unmanned, it is not possible to accurately describe the dominant noise sources, or specific noise events throughout the entire survey period. However at the beginning and end of the survey period the dominant noise source was noted to be traffic on the surrounding roads.

$L_{Aeq,\ 5min}$ levels were generally around 60-65dB during daytime hours (07:00 – 23:00) and 55dB during night-time hours (23:00 – 07:00). L_{Amax} levels were generally around 75-80dB during daytime hours and 65-75dB during night time hours.

8.0 ENVIRONMENTAL NOISE IMPACT ASSESMENT

The National Planning Policy Framework states that Local Authorities should ensure that new developments should not be put at unacceptable levels or risk from or be adversely affected by unacceptable levels of noise.

8.1 External Noise

8.1.1 Criteria

"DP28 Noise and Vibration" in Section 3 of the document "Camden Development Policies" contains the following external noise criteria:

Noise Description and Location	Time Period	Noise on Residential Site Adjoining Roads	
		At and above which Planning Permission will not be granted	At and above which attenuation measures will be required
Noise at 1m external to a sensitive facade	Day (07:00-19:00)	$L_{Aeq,\ 12hr}$ 72dB	$L_{Aeq,\ 12hr}$ 62dB
	Eve (19:00-23:00)	$L_{Aeq,\ 4hr}$ 72dB	$L_{Aeq,\ 4hr}$ 57dB
	Night (23:00-07:00)	$L_{Aeq,\ 8hr}$ 66dB	$L_{Aeq,\ 8hr}$ 52dB
Individual Noise Events several times an hour	Night (23:00-07:00)	-	$L_{Amax,s}$ 82dB

8.1.2 Assessment

To compare the results of our survey with the criteria specified above, it is necessary to convert the measured 5 minute interval data into daytime $L_{Aeq,\ 12hr}$, evening $L_{Aeq,\ 4hr}$, and night time $L_{Aeq,\ 8hr}$ values. These values are presented in the ta
ble below.

Time Period	Measured Noise Level
Day (07:00-19:00)	$L_{Aeq,\ 12hr}$ 64dB
Eve (19:00-23:00)	$L_{Aeq,\ 4hr}$ 59dB
Night (23:00-07:00)	$L_{Aeq,\ 8hr}$ 57dB

Additionally, L_{Amax} events above 82dB occurred only three times during night time hours during the survey.

It can be seen from the above that the measured levels are below the criteria at which planning permission will not be granted, but are above the criteria at which mitigation measures will be required.

8.2 Internal Noise

8.2.1 BS8233

Section 7.6.1 of BS8233:1999 states that reasonable resting and sleeping conditions in living rooms and bedrooms can be achieved by the following target $L_{Aeq,T}$ noise levels:

Room Type	$L_{Aeq,T}$	
	Good	Reasonable
Living Room	30dB	40dB
Bedrooms	30dB	35dB

The Standard also states *"For a reasonable standard in bedrooms at night, individual noise events (measure with F time-weighting) should not normally exceed 45dB L_{Amax}."*

8.2.2 World Health Organisation

The World Health Organisation document on "Guidelines for Community Noise" states the following guideline values for community noise in specific environments.

Specific Environment	Critical Health Effect(s)	L_{Aeq}	$L_{Amax,fast}$
Dwelling, indoors	Speech intelligibility and moderate annoyance	35dB	-
Inside Bedrooms	Sleep disturbance, night-time	30dB	45dB

The document also states *"For a good sleep, it is believed that indoor sound pressure levels should not exceed approximately 45dBA L_{Amax} more than 10-15 times per night, (Vallet & Varnet 1991)."*

The above levels are however the subject of much controversy, as indicated by one of the feature articles in the January/February 2003 edition of the Institute of Acoustics' publication.

In our opinion the WHO criteria should thus be regarded as preferred, rather than mandatory maxima to be achieved in all cases.

8.2.3 Proposed Criteria

On the basis of the above we would propose the following internal noise levels be adopted as minimum design targets in the worst affected dwellings.

Room Type	Period	Criterion
Living Areas	Daytime (07:00-23:00 hours)	40dB $L_{Aeq, 16hr}$
Bedrooms	Night-time (23:00-07:00 hours)	35dB $L_{Aeq, 8hr}$

In addition it is proposed that L_{Amax} noise levels in bedrooms should not regularly exceed approximately 45dBA.

8.2.4 Mitigation Measures

Provision exists to provide additional sound insulation as required. The external envelope of the proposed residences will incorporate suitably specified glazing, so as to achieve the criteria summarised above.

At this stage of the design scheme the precise types of window to be used are not known.

The Local Planning Authority would expect to be provided with details of the sound insulation treatments when available. Therefore in granting consent it would be appropriate for planning condition to be imposed along the following lines, based on the following example condition drawn from PPG24:

Construction work shall not begin until a scheme for protecting the dwellings against noise from [ ] has been submitted to and approved by the Local Planning Authority; for each applicable dwelling all works which form part of the scheme for that dwelling shall be completed before the dwelling is occupied.

8.2.5 Achievable Internal Noise Levels

We have predicted the levels that would be achievable in the worst-case habitable rooms closest to the dominant noise source.

Annex 6 of PPG24 states the following:

"Typical noise reduction of a dwelling façade with windows set in brick/block wall."

Difference Between External and Internal Noise Levels			
Noise Source	**Single Glazing**	**Thermal Double Glazing**	**Secondary Glazing**
Road Traffic	28dBA	33dBA	34dBA
Civil Aircraft	27dBA	32dBA	35dBA
Military Aircraft	29dBA	35dBA	39dBA
Diesel Train	28dBA	32dBA	35dBA
Electric Train	30dBA	36dBA	41dBA

Note: The values in the above Table are the difference between dBA levels measured outside and inside typical dwellings, therefore 3dBA should be added to free field noise levels to determine outside levels.

A simple assessment based on the above indicates the following noise levels may be expected within the proposed worst case dwellings with secondary glazing.

Daytime $L_{Aeq(12\text{-hour})}$	**Evening $L_{Aeq(4\text{-hour})}$**	**Night-time $L_{Aeq(8\text{-hour})}$**
35 dBA	30 dBA	28 dBA

In addition, L_{Afmax} noise levels in bedrooms should not regularly exceed 45dB during night time hours. These predicted worst case internal noise levels meet the proposed criteria. It is thus demonstrated that acceptable internal noise levels are achievable.

9.0 CONCLUSIONS

A detailed environmental noise survey has been undertaken in order to establish the currently prevailing environmental noise climate around the site.

From the measured environmental noise levels an assessment has been undertaken to determine the suitability of the site based on the requirements of the Local Authority.

Appropriate internal noise criteria have been proposed. They are achievable using conventional constructions.

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Appendix A

The acoustic terms used in this report are explained below:

dB : Decibel - Used as a measurement of sound pressure level. It is the logarithmic ratio of the noise being assessed to a standard reference level.

dBA : The human ear is more susceptible to mid-frequency noise than the high and low frequencies. To take account of this when measuring noise, the 'A' weighting scale is used so that the measured noise corresponds roughly to the overall level of noise that is discerned by the average human. It is also possible to calculate the 'A' weighted noise level by applying certain corrections to an un-weighted spectrum. The measured or calculated 'A' weighted noise level is known as the dBA level.

Because of being a logarithmic scale noise levels in dBA do not have a linear relationship to each other. For similar noises, a change in noise level of 10dBA represents a doubling or halving of subjective loudness. A change of 3dBA is just perceptible.

L_{10} & L_{90}: If a non-steady noise is to be described it is necessary to know both its level and the degree of fluctuation. The Ln indices are used for this purpose, and 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 the 'average maximum level'. Similarly, L_{90} is the average minimum level and is often used to describe the background noise.

It is common practice to use the L_{10} index to describe traffic noise, as being a high average, it takes into account the increased annoyance that results from the non-steady nature of traffic noise.

L_{eq} : The concept of L_{eq} (equivalent continuous sound level) has up to recently been primarily used in assessing noise in industry but seems now to be finding use in defining many other types of noise, such as aircraft noise, environmental noise and construction noise.

L_{eq} is defined as 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. 1 hour).

The use of digital technology in sound level meters now makes the measurement of L_{eq} very straightforward.

L_{max} : L_{max} is the maximum sound pressure level recorded over the period stated. L_{max} is sometimes used in assessing environmental noise where occasional loud noises occur, which may have little effect on the L_{eq} noise level.

29-35 Farringdon Road

Monday 24/02/2014 - Tuesday 25/02/2014