81 Avenue Road
London
NW8 6JD

Environmental Noise Survey and Noise Impact Assessment Report

22491/NIA1

16 August 2016

For:
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Document Control

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0	16/08/2016	-		
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Contents

Attachments

1.0 Introduction

It is proposed to redevelop the existing property at 81 Avenue Road, London.

Hann Tucker Associates have therefore been commissioned to undertake a detailed, fully automated noise survey of the site and to prepare a report to address concerns regarding the impact of noise generated from the surrounding area. This data will also be used to set plant noise emission criteria which the proposed plant should not exceed based on the requirements of the Local Authority.

This report presents the methodology and findings of our noise survey and assessment in the context of the National Planning Policy Framework (NPPF) and the requirements of the Local Authority.

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

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

Based on the results of the noise survey, and with reference to the requirements of the Local Authority, to recommend suitable plant noise emission criteria.

These objectives are as set out in our letter dated 4 July 2016 and written instructions received on 4 August 2016.

3.0 Site Description

3.1 Location

The site is located at 81 Avenue Road in West London and falls within the jurisdiction of Camden Council. See Location Map below.

Location Map

3.2 Description

81 Avenue Road is a detached ground plus 1 storey building. The surrounding buildings are all residential and predominantly of a similar height. 83 Avenue Road to the north is a ground plus 2 storey building.

The main noise source during our survey was road traffic noise on Avenue Road.

See Site Plan below.

Site Plan

4.0 Acoustic Terminology

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

5.0 Methodology

The survey was undertaken by Nick Russell MIOA.

5.1 Unmanned Survey

5.1.1 Procedure

Fully automated environmental noise monitoring was undertaken from approximately 12:00 hours on Wednesday 10 August to 13:00 hours on Thursday 11 August 2016.

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 calm and the sky was predominantly clear. We understand that generally throughout the survey period the weather conditions were very similar to these and they are considered suitable for obtaining representative measurements.

Measurements were taken continuously of the A-weighted (dBA) L_{90}, L_{eq} and L_{max} sound pressure levels over 15 minute periods.

5.1.2 Measurement Position

The noise level measurements were undertaken at one position on site. The microphone was attached to railings on a wall at the front of the building. It was installed approximately 1.8m above the ground and considered to be in free field conditions.

This position was selected to establish typical noise level at the building and is shown on the following plan.

Plan Showing Unmanned Measurement Positions

5.1.3 Instrumentation

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

Description	Manufacturer	Type	Serial Number	Calibration
Type 1 Data Logging Sound Level Meter	Larson Davis	824	3443	LD calibration on 21/01/2016
Type 1 Calibrator	Larson Davis	CAL200	3082	LD calibration on 09/06/2016

The sound level meter, including the extension cable, was calibrated prior to and on completion of the survey**s**. No significant changes were found to have occurred (no more than 0.5dB).

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

6.0 Results

The results have been plotted on Time History Graph 22491/TH1 enclosed presenting the 15 minute A-weighted (dBA) L_{90}, L_{eq} and L_{max} levels at each measurement position throughout the duration of the survey.

A summary of the noise levels measured during the survey is presented in the table below:

Measured Noise Level (dBA re $2x10^{-5}$ Pa)		
Parameter	**Daytime (07:00-23:00 hours)**	**Night time (23:00-07:00 hours)**
$L_{Aeq,T}$	63	58
Typical L_{max}	89	75
Lowest Measured $L_{A90,15min}$	48	37

6.1 L_{eq} Noise Levels

In order to compare the results of our survey with suitable guidelines it is necessary to convert the measured $L_{Aeq(15\ minute)}$ noise levels into single figure daytime $L_{Aeq(16\text{-}hour)}$ (07:00-23:00 hours) and night-time $L_{Aeq(8\text{-}hour)}$ (23:00-07:00 hours) levels.

The daytime $L_{Aeq(16\text{-}hour)}$ and night-time $L_{Aeq(8\text{-}hour)}$ noise levels for each position are presented in the tables below.

Daytime $L_{Aeq(16\text{-}hour)}$	Night-Time $L_{Aeq(8\text{-}hour)}$
63dB	58dB

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 road traffic noise on Avenue Road.

8.0 Plant Noise Emission Criteria

The site lies within the jurisdiction of Camden Council. Camden Council's requirements for new installation of building services plant affecting residential properties are as follows:

"Noise levels at a point 1 metre external to sensitive facades shall be at least 5dBA less than the existing background measurement (L_{A90}), expressed in dBA when all plant/equipment are in operation. Where it is anticipated that any plant/equipment will have a noise that has a distinguishable, discrete continuous note (whine, hiss, screech, hum) and/or if there are distinct impulses (bangs, clicks, clatters, thumps) special attention should be given to reducing the

noise levels from that piece of plant/equipment at any sensitive façade to at least 10dBA below the L_{A90}, expressed in dBA."

We therefore propose the following plant noise emission limits to be achieved at 1m from the façades of the nearest neighbouring buildings:

Plant Noise Emission Criteria (dB re 2x10-5 Pa)	
Daytime (07:00 – 23:00 hours)	**Night-time (23:00 – 07:00 hours)**
43dBA	32dBA

It should be noted that the above plant noise emission limits are subject to approval from Camden Council.

9.0 Planning Policy/Guidance

9.1 National Planning Policy Framework (NPPF)

The following paragraph is from the NPPF:

"123.Planning policies and decisions should aim to:

- *avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development;*
- *mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions;*
- *recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established; and*
- *identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason."*

9.2 Camden Council Development Policy (DP28)

While there are no criteria in current Building Regulations concerning external noise intrusion we understand that Camden Council typically apply the criteria detailed within their Development Policy 28 adopted in 2010. This document states:

"28.3 The Council will only grant planning permission for development sensitive to noise in locations that experience noise pollution, and for development likely to generate noise pollution, if appropriate attenuation measures are taken, such as double-glazing. Planning permission will not be granted for development sensitive to noise in locations that have unacceptable levels of noise. Where uses sensitive to noise are proposed close to an existing source of noise or when development that generates noise is proposed, the Council will require an acoustic report to ensure compliance with PPG24: Planning and noise. A condition will be imposed to require that the plant and equipment which may be a source of noise pollution is kept working efficiently and within the required noise limits and time restrictions. Conditions may also be imposed to ensure that attenuation measures are kept in place and effective throughout the life of the development.

28.4 In assessing applications, we will have regard to the Noise and Vibration Thresholds, set out below. These represent an interpretation of the standards in PPG24 and include an evening period in addition to the day and night standards contained in the PPG, which provide a greater degree of control over noise and vibration during a period when noise is often an issue in the borough."

In addition Camden include the following Table B which indicates noise levels above which attenuation measures are required:

Period	Time	Sites adjoining Railways	Sites adjoining Roads
Day	0700 - 1900	65 dB LAeq,12h	62 dB LAeq,12h
Evening	1900 - 2300	60 dB LAeq,4h	57 dB LAeq,4h
Night	2300 - 0700	55 dB LAeq,1h	52 dB LAeq,1h

9.3 BS8233 and WHO Guidelines

Various reference documents including BS 8233: 2014 edition and WHO Community Noise Guidelines present acoustic criteria for residential premises, as outlined below. These guidelines are entirely discretional.

British Standard 8233: 2014 "Guidance on sound insulation and noise reduction for buildings" provides guidance for the control of noise in and around buildings.

Section 7.7.2 "Internal ambient noise levels for dwellings" states:

In general for steady external noise sources, it is desirable that internal ambient noise levels do not exceed the following guideline values:

Activity	*Location*	*Desirable Internal Ambient Criteria*	
		07:00 – 23:00	*23:00 to 07:00*
Resting	*Living Rooms*	*35 dB $L_{Aeq,16hour}$*	-
Dining	*Dining Room/Area*	*40 dB $L_{Aeq,16hour}$*	-
Sleeping (Daytime Resting)	*Bedroom*	*35 dB $L_{Aeq,16hour}$*	*30 dB $L_{Aeq,8hour}$*

Note 7 states:

"Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved".

Section 7.7.3.2 "Design criteria for external noise" states:

"For traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$[1], with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments. However, it is also recognized that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited".

9.4 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.

Activity	Location	Desirable Internal Ambient Criteria	
		07:00 – 23:00	23:00 to 07:00
Resting	Living Rooms	35 dB $L_{Aeq,16hour}$	-
Dining	Dining Room/Area	40 dB $L_{Aeq,16hour}$	-
Sleeping (Daytime Resting)	Bedroom	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,8hour}$

Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved.

9.5 Discussion

The results of our environmental noise survey indicate that the noise levels detailed in Table B (Section 9.2 above) were marginally exceeded.

10.0 Mitigation Measures

Provision exists to provide additional sound insulation as required. The following noise mitigation measures are proposed:

- The external envelope of the proposed residences will incorporate suitably specified glazing, so as to achieve the proposed criteria summarised above.
- The dwellings will be provided with whole house ventilation systems. Where ventilation would be provided through the façade it would be suitably acoustically attenuated to ensure the achievement of the proposed internal noise criteria would not be compromised.
- The dwellings will be comfort cooled.

At this stage of the design scheme the precise types of window to be used is not known. Nor have selections of acoustic vents been made.

The Local Planning Authority could expect to be provided with details of the sound insulation treatments when available. Therefore in granting consent it could be appropriate for planning condition(s) to be imposed along the following lines:

"Construction work shall not begin until a scheme for protecting the dwellings against noise from road traffic 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.~"

11.0 Achievable Internal Noise Levels

We have predicted the levels that would be achievable in the worst-case habitable rooms.

Annex 6 of PPG24 states the following:

The following table indicates "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

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

Daytime $L_{Aeq(16\text{-}hour)}$	**Night-time $L_{Aeq(8\text{-}hour)}$**	**L_{Amax}**
30dBA	28dBA	42dBA

These predicted worst case internal noise levels meet the proposed criteria. It is thus demonstrated that acceptable internal noise levels are achievable.

12.0 Conclusions

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

Plant noise emission criteria have been proposed in accordance with the Local Authority's requirements.

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

The environmental noise impact upon the proposed dwellings has been assessed in the context of the NPPF and the requirements of the Local Authority. Mitigation advice to reduce to a minimum the adverse impact on health and quality life arising from environmental noise have been recommended.

Based upon the results of our survey and subsequent assessment the proposed development is considered compliant with the local policy of Camden Council.

Appendix A

The acoustic terms used in this report are defined as follows:

dB — Decibel - Used as a measurement of sound level. Decibels are not an absolute unit of measurement but an expression of ratio between two quantities expressed in logarithmic form. The relationships between Decibel levels do not work in the same way that non-logarithmic (linear) numbers work (e.g. 30dB + 30dB = 33dB, not 60dB).

dBA — The human ear is more susceptible to mid-frequency noise than the high and low frequencies. The 'A'-weighting scale approximates this response and allows sound levels to be expressed as an overall single figure value in dBA. The $_A$ subscript is applied to an acoustical parameter to indicate the stated noise level is A-weighted

It should be noted that 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.

$L_{90,T}$ — L_{90} is the noise level exceeded for 90% of the period *T* (i.e. the quietest 10% of the measurement) and is often used to describe the background noise level.

$L_{eq,T}$ — $L_{eq,T}$ is the equivalent continuous sound pressure level. It is an average of the total sound energy measured over a specified time period, *T*.

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.

L_p — Sound Pressure Level (SPL) is the sound pressure relative to a standard reference pressure of 2×10^{-5} Pa. This level varies for a given source according to a number of factors (including but not limited to: distance from the source; positioning; screening and meteorological effects).

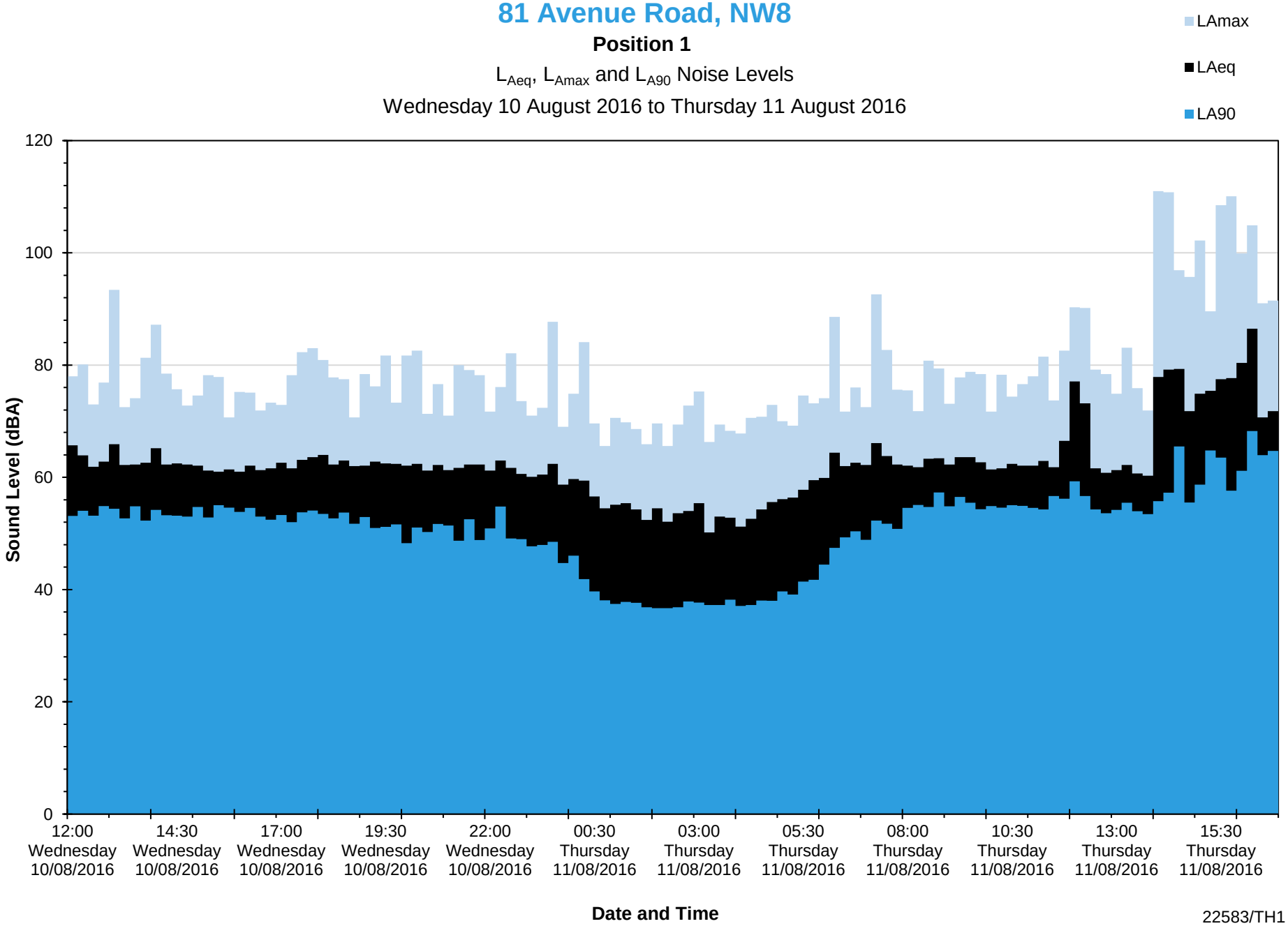
L_w — Sound Power Level (SWL) is the total amount of sound energy inherent in a particular sound source, independent of its environment. It is a logarithmic measure of the sound power in comparison to a specified reference level (usually 10^{-12} W).

81 Avenue Road, NW8

Position 1

L_{Aeq}, L_{Amax} and L_{A90} Noise Levels

Wednesday 10 August 2016 to Thursday 11 August 2016



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