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100 HAMPSTEAD ROAD, LONDON

NOISE IMPACT ASSESSMENT

Report 13915.NIA.01

Prepared on 3rd March 2016

For:

Cachamay Limited

103 Hampstead Road

London

NW1 3EL

Registered in England Company No. 7947892
KP Acoustics is the Trading Name of KP Acoustics Limited

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List of Attachments

1.0 INTRODUCTION

KP Acoustics Ltd, Britannia House, 11 Glenthorne Road, London, W6 0LH, has been commissioned by Cachamay Limited, 103 Hampstead Road, London, NW1 3EL, to undertake a noise breakout assessment between the Ground Floor proposed restaurant extension at 100 Hampstead Road, London and the external environment as well as the nearby residential apartments. The measured noise levels will be used to investigate and assess the noise impact from the Ground Floor facility to the nearby residential spaces.

This report presents the results of the environmental survey followed by calculations and propositions of the performance of the building's external fabric, for the predicted breakout noise at the closest residential window.

2.0 PROCEDURE AND EQUIPMENT

2.1 Environmental Noise Survey

Measurements of existing environmental noise were undertaken at the position shown on the site plans 13915.SP1-SP2. The choice of this position was based both on accessibility and on collecting representative noise data in relation to the nearest noise sensitive receiver.

Continuous automated monitoring was undertaken for the duration of the survey between 1st March 2016 and 2nd March 2016.

Weather conditions were generally dry with light winds, therefore deemed suitable for the measurement of environmental noise.

The measurement procedure complied with ISO 1996-2:2007 Acoustics "*Description, measurement and assessment of environmental noise - Part 2: Determination of environmental noise levels*".

The equipment calibration was verified before and after use and no abnormalities were observed.

The equipment used was as follows.

- 1 No. Svantek Type 957 Class 1 Sound Level Meter
- B&K Type 4231 Class 1 Calibrator

3.0 RESULTS

3.1 Environmental Noise Survey

The $L_{Aeq: 5min}$, $L_{Amax: 5min}$, $L_{A10: 5min}$ and $L_{A90: 5min}$ acoustic parameters were measured and are shown as a time history in Figure 13915.TH1.

Minimum background (L_{A90}) levels monitored for the duration of the survey are shown in Table 3.1.

	Daytime 07:00 to 23:00	**Night Time 23:00 to 07:00**
Minimum background noise level ($L_{A90,\ 5min}$)	58dB(A)	56dB(A)

Table 3.1: Minimum background noise levels measured during the environmental noise survey

3.2 Direct Noise Transfer

The closest noise-sensitive receiver to the current premises would be the residential window as shown in 13915.SP1-SP2. Please note that the party element between the proposed Ground Floor restaurant's extension and the First Floor Flat would comprise an area of approx. 5m^2. Any noise transfer from the proposed restaurant's extension to the First Floor Flat would be anticipated not to generate any intrusive levels as the separating floor comprises a concrete slab (200mm min.) which would be expected to provide a minimum of 60dB, D_w. This would be sufficient to control any direct noise transfer due to the fact that noise generated in a typical restaurant space is not high (max. 80-85dB(A)) and mainly entails mid-high frequency components (above 250Hz) which are easily attenuated by the existing party floor.

3.3 Noise Breakout Measurements

The main parameter used throughout this document to express airborne sound insulation of separating constructions is D_w. All specifications in this report will therefore be given with respect to this descriptor. It should be noted that there is a difference of about 5-8 dB between the laboratory sound insulation R_w value and the D_w measured on site, with the latter being lower as it is dependent on various parameters such as junction detailing, workmanship, penetrations and flanking.

Summarised results of the airborne tests are shown in Table 3.2. Source noise levels were in the region of approximately 100dB(A) within the main proposed restaurant's extension space.

Test Element	Source	Receiver	D_w Performance
External Façade	Restaurant	Location 1 (Exterior) – Front Ground Floor façade	29 dB

Table 3.2: Breakout test results

4.0 DISCUSSION

In order to ensure that the amenity of the closest residential receivers is protected, we would suggest a noise emissions criterion of 10dB below the minimum night-time background noise profile of the area (L_{A90}). This would ensure that any break-out noise is fully comparable to the ambient noise footprint of the area, and therefore non-significant with regards to its contribution.

It is currently assumed that internal noise levels within the Ground Floor Restaurant would be in the region of 80-85dB(A), representing a typical restaurant soundscape.

4.1 Prediction for Noise Breakout

It is currently assumed that internal noise levels within the Ground Floor Restaurant would be in the region of 80-85dB(A), representing a typical restaurant soundscape, and the measured D_w of the external building façade, Table 4.1 shows the predicted sound pressure level at the nearest noise sensitive receiver due to occasional activity within the Ground Floor space, compared with the measured ambient background noise. Detailed calculations are shown in Appendix B.

Receiver	External Noise Criterion 10dB below minimum background night-time level (L_{A90})	Noise Level at Receiver (1m from window)
Nearest Noise Sensitive Window	46dB(A)	29dB(A)

Table 4.1: Predicted noise level at closest noise sensitive receiver

As can be seen from Table 4.1, the noise break-out element through the external façade would result in a general level which would fully satisfy the night-time criterion.

5.0 CONCLUSION

An environmental noise survey has been undertaken at proposed restaurant extension at 100 Hampstead Road, London. The results of the survey have enabled the assessment of noise propagation of typical activity to the nearest noise sensitive receiver.

Noise break-out measurements have also been undertaken in order to assess predicted noise levels at the closest residential window. Noise levels have been predicted at the nearest noise sensitive receiver in comparison to measured minimum ambient night time noise levels, and would be expected to have no negative impact on the amenity of neighbouring residents.

No specific upgrade measures would therefore be deemed necessary in order to protect the amenity of the nearest noise sensitive receivers.

Report by	Checked by
Spyros Polycronopolus MIOA	**Kyriakos Papanagiotou MIOA**
KP Acoustics Ltd	**KP Acoustics Ltd**

Title:

Indicative site plan showing noise monitoring position and closest noise sensitive receiver

Date: 3 March 2016

FIGURE 13915.SP1

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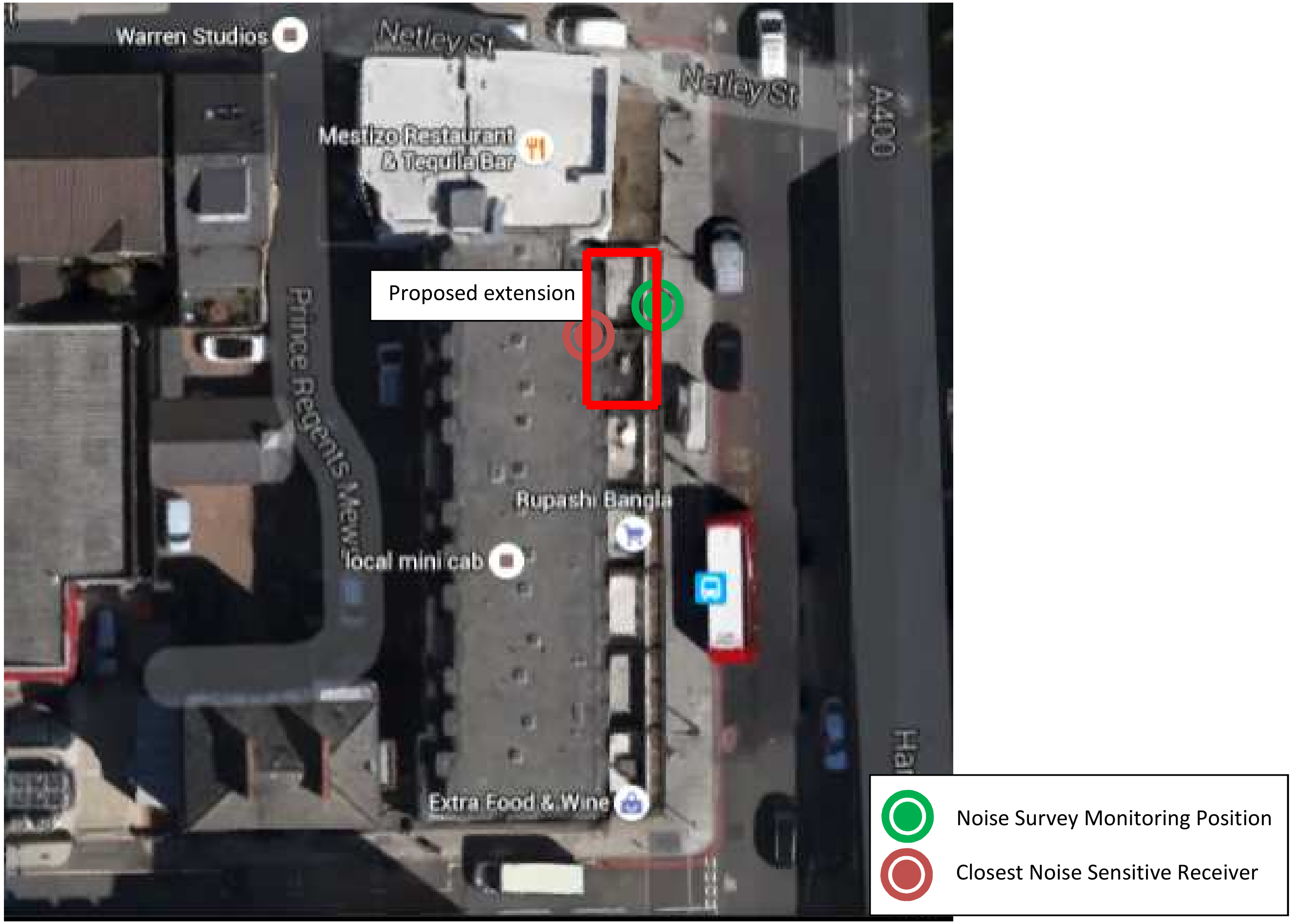

Title:

Indicative site plan showing noise monitoring position and closest noise sensitive receiver

(Ref Google Maps)

Date: 3 March 2016

FIGURE 13915.SP2

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100 Hampstead Road, London
Environmental Noise Time History
1st February to 2nd February 2016

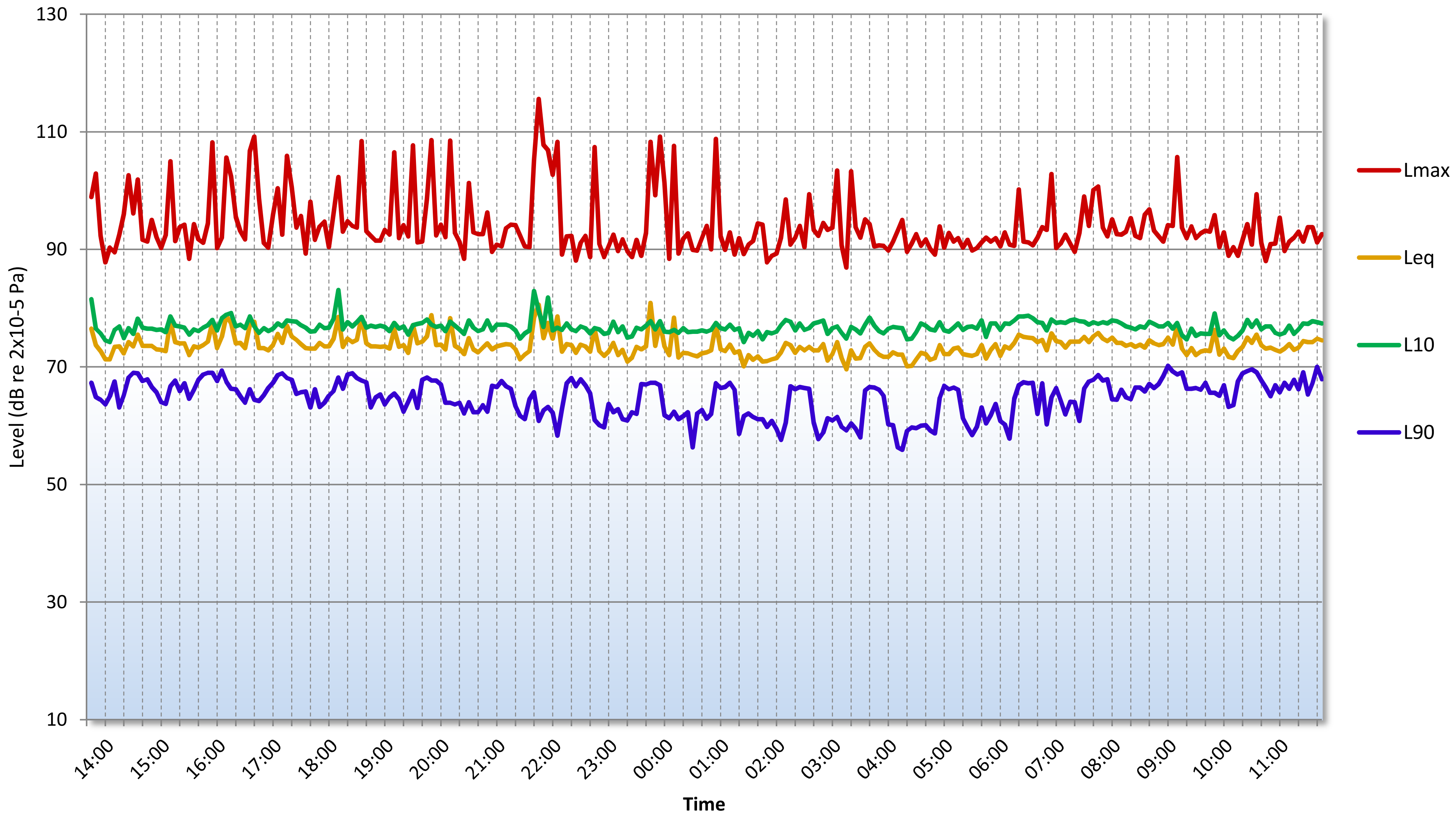

Figure 13915.TH1

APPENDIX A

GENERAL ACOUSTIC TERMINOLOGY

Decibel scale - dB

In practice, when sound intensity or sound pressure is measured, a logarithmic scale is used in which the unit is the 'decibel', dB. This is derived from the human auditory system, where the dynamic range of human hearing is so large, in the order of 10^{13} units, that only a logarithmic scale is the sensible solution for displaying such a range.

Decibel scale, 'A' weighted - dB(A)

The human ear is less sensitive at frequency extremes, below 125Hz and above 16Khz. A sound level meter models the ears variable sensitivity to sound at different frequencies. This is achieved by building a filter into the Sound Level Meter with a similar frequency response to that of the ear, an A-weighted filter where the unit is dB(A).

L_{eq}

The sound from noise sources often fluctuates widely during a given period of time. An average value can be measured, the equivalent sound pressure level L_{eq}. The L_{eq} is the equivalent sound level which would deliver the same sound energy as the actual fluctuating sound measured in the same time period.

L_{10}

This is the level exceeded for no more than 10% of the time. This parameter is often used as a "not to exceed" criterion for noise.

L_{90}

This is the level exceeded for no more than 90% of the time. This parameter is often used as a descriptor of "background noise" for environmental impact studies.

L_{max}

This is the maximum sound pressure level that has been measured over a period.

Octave Bands

In order to completely determine the composition of a sound it is necessary to determine the sound level at each frequency individually. Usually, values are stated in octave bands. The audible frequency region is divided into 11 such octave bands whose centre frequencies are defined in accordance with international standards. These centre frequencies are: 16, 31.5, 63, 125, 250, 500, 1000, 2000, 4000, 8000 and 16000 Hertz.

Environmental noise terms are defined in BS7445, *Description and Measurement of Environmental Noise*.

APPENDIX A

APPLIED ACOUSTIC TERMINOLOGY

Addition of noise from several sources

Noise from different sound sources combines to produce a sound level higher than that from any individual source. Two equally intense sound sources operating together produce a sound level which is 3dB higher than a single source and 4 sources produce a 6dB higher sound level.

Attenuation by distance

Sound which propagates from a point source in free air attenuates by 6dB for each doubling of distance from the noise source. Sound energy from line sources (e.g. stream of cars) drops off by 3dB for each doubling of distance.

Subjective impression of noise

Hearing perception is highly individualised. Sensitivity to noise also depends on frequency content, time of occurrence, duration of sound and psychological factors such as emotion and expectations. The following table is a guide to explain increases or decreases in sound levels for many scenarios.

Change in sound level (dB)	Change in perceived loudness
1	Imperceptible
3	Just barely perceptible
6	Clearly noticeable
10	About twice as loud

Transmission path(s)

The transmission path is the path the sound takes from the source to the receiver. Where multiple paths exist in parallel, the reduction in each path should be calculated and summed at the receiving point. Outdoor barriers can block transmission paths, for example traffic noise. The effectiveness of barriers is dependent on factors such as its distance from the noise source and the receiver, its height and construction.

Ground-borne vibration

In addition to airborne noise levels caused by transportation, construction, and industrial sources there is also the generation of ground-borne vibration to consider. This can lead to structure-borne noise, perceptible vibration, or in rare cases, building damage.

Sound insulation - Absorption within porous materials

Upon encountering a porous material, sound energy is absorbed. Porous materials which are intended to absorb sound are known as absorbents, and usually absorb 50 to 90% of the energy and are frequency dependent. Some are designed to absorb low frequencies, some for high frequencies and more exotic designs being able to absorb very wide ranges of frequencies. The energy is converted into both mechanical movement and heat within the material; both the stiffness and mass of panels affect the sound insulation performance.

APPENDIX B

100 Hampstead Road, London

NOISE EMISSIONS CALCULATIONS

$$SPL_{receiver} = SPL_{indoor} - 6 - SRI_{composite} + 10\log_{10} S + 10\log Q - 20\log r - 11dB$$

Source: Restaurant's Operations

Receiver: Nearest Residential Window

	dB(A)
Sound Pressure Level	
Anticipated Internal Levels / extention of the Restaurant	85
Correction	-6
Attenuation Provided by Glazed façade (Dw)	-29
Correction for directivity (Q=2)	3
Correction for the façade's area (56 sqm)	17
Attenuation Provided by screening	-10
Attenuation Provided by Distance (minimum 10m)	-20
Correction	-11
Sound Pressure Level 1m from Closest Noise Sensitive Receiver	**29**

Design Criterion	**46**