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82 NEW OXFORD STREET,
LONDON

NOISE IMPACT ASSESSMENT

Report **11884-NIA-01**

Prepared on 19 December 2016

Issued For:

Ferretti London 1 Ltd

82 New Oxford Street

London

WC1A 1HB

committed to CSCS Platinum award

ISO 17025

ISO 9001

Institute of Acoustics sponsoring organisation

Contents

List of Attachments

1.0 INTRODUCTION

Clement Acoustics has been commissioned by Ferretti London 1 Ltd to measure existing background noise levels at 82 New Oxford Street, London. The measured noise levels have been used to determine noise emission criteria for a proposed plant installation in agreement with the planning requirements of the London Borough of Camden.

This report presents the results of the environmental survey followed by noise impact calculations to set maximum allowable noise emissions from proposed plant installations.

2.0 SITE DESCRIPTION

Current proposals are to upgrade kitchen ventilation systems at 82 New Oxford Street. The design of the system is not yet finalised, although it is understood any system will duct to ventilation louvres on the rear facade at ground floor level.

The closest identified residential windows to the proposed plant location are to residential apartments approximately 25m to the east, and hotel windows approximately 30m to the west.

All locations are shown in attached the site plan 11884-SP1.

3.0 ENVIRONMENTAL NOISE SURVEY

3.1 Procedure

Based on access restrictions and the level of noise on site due to existing plant units at adjacent premises, it was not deemed relevant to carry out an environmental noise survey at the proposed development site.

Attended measurements were therefore undertaken at two positions close to the identified receivers as shown on indicative site drawing 11620-SP1. It was ensured that measurement positions were away from any plant installations and measurements were timed to be outside of typical rush hours.

Monitoring was undertaken between 09:30 and 11:00 on 19 December 2016.

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

Background noise levels at the monitoring positions consisted of road traffic noise from surrounding roads.

The measurement procedure generally complied with BS7445:1991. *Description and measurement of environmental noise, Part 2- Acquisition of data pertinent to land use*.

3.2 Equipment

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

The equipment used was as follows.

- 1 No. Svantek Type 971 Class 1 Sound Level Meter
- Norsonic Type 1251 Class 1 Calibrator

4.0 RESULTS

The $L_{Aeq:\ 5min}$, $L_{Amax:\ 5min}$, $L_{A10:\ 5min}$ and $L_{A90:\ 5min}$ acoustic parameters were measured at the locations shown in site drawing 11884-SP1.

Ambient and background noise levels are summarised in Table 4.1.

	Average ambient noise level $L_{Aeq:\ 5min}$ dB(A)	Minimum background noise level $L_{A90:\ 5min}$ dB(A)
Position 1	64	59
Position 2	66	62

Table 4.1: Minimum background noise levels

5.0 NOISE CRITERIA

The *London Borough of Camden* criteria for noise emissions are as follows:

> *"The 'A' weighted sound pressure level from the plant, when operating at its noisiest, shall not at any time exceed a value of 10dB below the minimum external background noise, at a point 1 metre outside any window of any residential property."*

It is understood that the proposed plant will be in use during daytime hours only. Using the minimum measured background noise levels shown in Table 4.1 is therefore considered suitably robust.

We therefore propose to set the noise criteria at **49 dB(A)**, the value 10dB below the minimum measured background noise level at either receiver location.

This is expected to ensure inaudibility of external plant units at residential windows, including an allowance for tonal penalties.

6.0 DISCUSSION

6.1 Proposed Installation

Although the general layout of the proposed system has been designed, specific fan units have not yet been selected.

Calculations have therefore been undertaken in order to set maximum allowable noise units for proposed external units ducting to the rear facade as currently proposed.

6.2 Maximum Allowable Noise Emissions

Preliminary calculations have taken the following factors into account:

- Noise emissions criterion of 49 dB(A) at residential windows as stated in Section 5.0,
- Distance of 25m between proposed plant location and closest receiver.

Based on the above, the maximum allowable cumulative sound pressure level from all external plant is **77 dB(A) at 1m**. The stated maximum allowable level should take the following into account:

- Manufacturer's maximum stated source noise level,
- Cumulative level due to all units,
- Correction for reflections (typically +3dB when compared to anechoic conditions),
- Any proposed mitigation measures, such as silencers or acoustically treated louvres.

Once external units have been selected, calculations will be undertaken to ensure compliance with the proposed criterion can be achieved, through the use of mitigation measures as necessary.

7.0 CONCLUSION

An environmental noise survey has been undertaken at 82 New Oxford Street, London. The results of the survey have enabled criteria to be set for noise emissions from the proposed plant units in accordance with the requirements of the London Borough of Camden.

Preliminary calculations have been undertaken to provide a maximum allowable noise level from external plant units.

Further calculations will be undertaken once plant units have been selected.

Report by	Checked by
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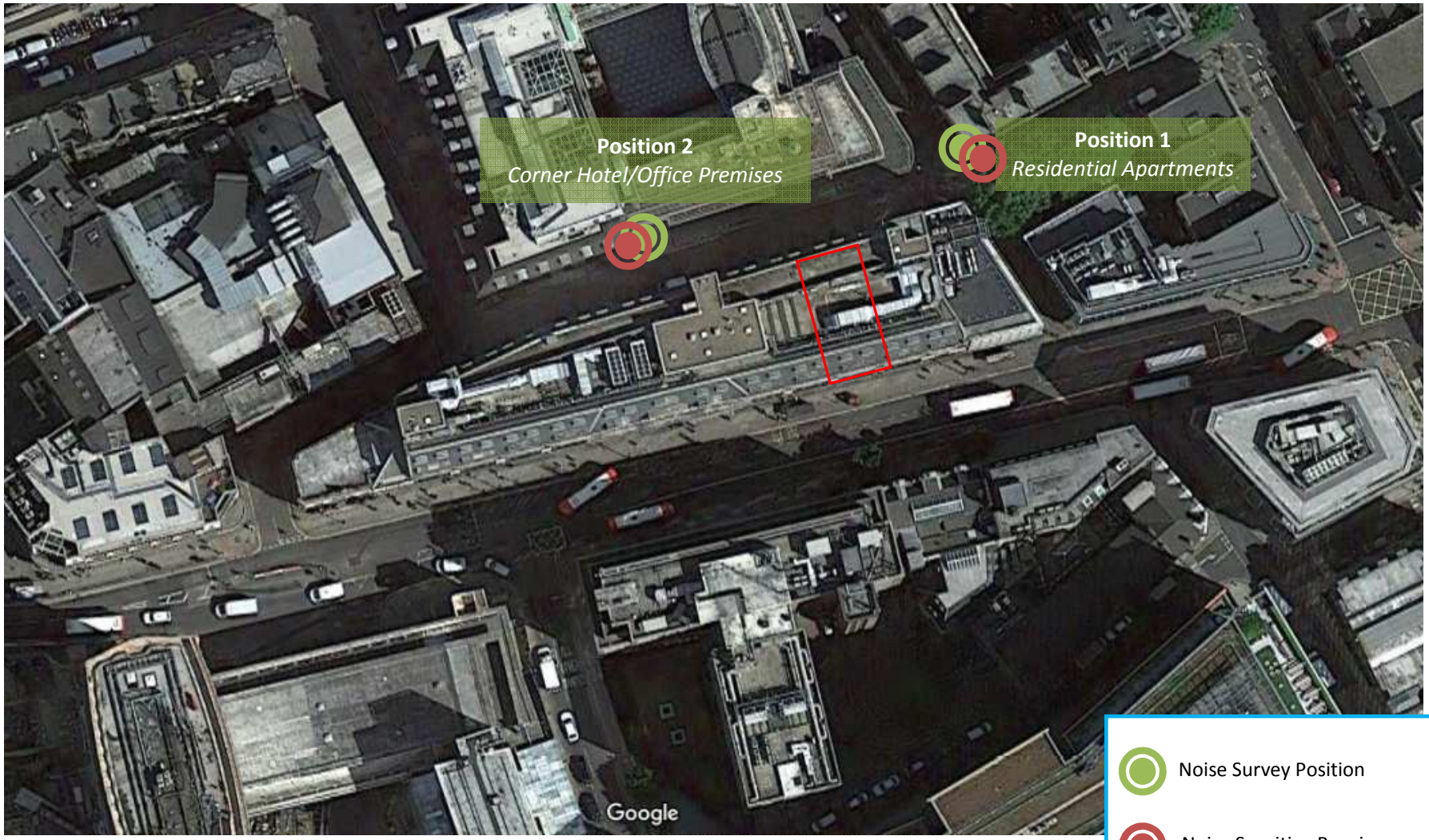

11884-SP1 Indicative site plan indicating noise monitoring position and nearest noise sensitive receiver

Date: 19 December 2016

APPENDIX A

GLOSSARY OF ACOUSTIC TERMINOLOGY

dB(A)

The human ear is less sensitive to low (below 125Hz) and high (above 16kHz) frequency sounds. A sound level meter duplicates the ear's variable sensitivity to sound of different frequencies. This is achieved by building a filter into the instrument with a similar frequency response to that of the ear. This is called an A-weighting filter. Measurements of sound made with this filter are called A-weighted sound level measurements and 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 not 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 not 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 10 such octave bands whose centre frequencies are defined in accordance with international standards.

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 one alone and 10 sources produce a 10dB 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

Sound intensity is not perceived directly at the ear; rather it is transferred by the complex hearing mechanism to the brain where acoustic sensations can be interpreted as loudness. This makes hearing perception 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 reasonable guide to help explain increases or decreases in sound levels for many acoustic scenarios.

Change in sound level (dB)	Change in perceived loudness
1	Imperceptible
3	Just barely perceptible
6	Clearly noticeable
10	About twice as loud
20	About 4 times as loud

Barriers

Outdoor barriers can be used to reduce environmental noises, such as traffic noise. The effectiveness of barriers is dependent on factors such as its distance from the noise source and the receiver, its height and its construction.

Reverberation control

When sound falls on the surfaces of a room, part of its energy is absorbed and part is reflected back into the room. The amount of reflected sound defines the reverberation of a room, a characteristic that is critical for spaces of different uses as it can affect the quality of audio signals such as speech or music. Excess reverberation in a room can be controlled by the effective use of sound-absorbing treatment on the surfaces, such as fibrous ceiling boards, curtains and carpets.