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51 FAIRFAX ROAD, LONDON

ACOUSTIC COMMISSIONING REPORT

Report **12150-AC-01 RevA**

Prepared on 09 August 2017

Issued For:

Delicatessen

51 Fairfax Road

London

NW6 4EL

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 Delicatessen, to undertake an assessment of an installed extract fan at 51 Fairfax Road, London. A previously undertaken background noise survey will be used to compare measured noise emissions with criteria set in agreement with the planning requirements of the London Borough of Camden.

This report presents the measurements taken at the installed plant and propagation calculations. The report also presents the measurements taken at the nearest noise sensitive receptor.

2.0 SITE DESCRIPTION

As part of recent development works, an extractor fan has been installed with the fan itself located inside. The proposed use is commercial to service the kitchen. The duct run is installed on the 1st floor flat roof and the duct run will run up the building and will terminate at roof level.

The nearest noise sensitive receivers have identified as the 2nd floor residential flat closest to the point at which the ducting is external.

3.0 INITIAL ENVIRONMENTAL NOISE SURVEY

3.1 Procedure

Measurements were undertaken at one position as shown on indicative site drawing 12150-SP1. The choice of this position was based both on accessibility and on collecting representative noise data in relation to the site.

Continuous automated monitoring was undertaken for the duration of the survey between 16:00 on 27 February and 10:30 on 1 March 2017.

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 traffic noise from surrounding roads and train movements on the line directly above the restaurant, during both daytime and night time hours.

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 957 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 location shown in site drawing 12150-SP1.

The measured noise levels are shown as a time history in Figure 12150-TH1, with ambient and background noise levels summarised in Table 4.1.

	Average ambient noise level $L_{Aeq:\ 5min}$ dB(A)	Minimum background noise level $L_{A90:\ 5min}$ dB(A)
Daytime (07:00 - 23:00)	63 dB(A)	48 dB(A)
Night-time (23:00 - 07:00)	49 dB(A)	43 dB(A)
Operating Hours (08:00 – 21:00)	64 dB(A)	48 dB(A)

Table 4.1: Minimum background noise levels

5.0 NOISE CRITERIA

Condition 11 of the Decision Notice states the following with regards to plant noise emissions:

> *"Prior to commencement of the development, details shall be submitted to and approved in writing by the Council, of the external noise level emitted from plant/machinery/equipment and mitigation measures as appropriate. The measures shall ensure that the external noise level emitted from plant, machinery/equipment will be lower than the lowest existing background noise level by at least 10dBA, by 15dBA where the source is tonal, as assessed according to BS4142:2014 at the Page 4 of 5 2015/3916/nearest and/or most affected noise sensitive premises, with all machinery operating together at maximum capacity."*

It is understood that the plant unit will be operational between the hours of 08:00 and 21:00.

In order to present as robust an assessment as possible, we therefore propose to set the noise criteria at 33 dB(A), the value 15 dB below the minimum measured background noise level during the day time hours. It should be noted that the proposed plant installation is not considered tonal.It should be noted the criterion is based on achieving a level 15dB below the minimum background noise level, as required for compliance with the London Borough of Camden.

6.0 DISCUSSION

6.1 Installation

The plant installation comprises the following condenser unit:

- 1 No. Helios Gigabox 500/4 extract fan

The above unit has been installed within the building and the silencer has been fitted externally to reduce noise emissions at the flue. In addition to this cladding has been installed around the ducting before the silencer to reduce noise levels. A site visit was undertaken in order to take manual measurements of the installed unit, such that noise emissions could be measured and assessed. The measurements were carried out by Andrew Thomas AMIOA.

Measurements were taken in single octave bands between 63Hz and 8kHz and each measurement lasted a minimum of 30 seconds. Short durations were taken in order to exclude background noises as far as reasonably possible.

Measurements were undertaken on 30 June 2017 at approximately 11:00.

The unit was set to operating duty whilst measurements of the plant were obtained.

In order to assess the duct work breakout, measurements were undertaken at 1m from the duct work, approximately 1.5m above the 1st floor flat roof. Measurements were also undertaken at 1m from the nearest residential window which is located a floor above on the 2nd floor.

	Sound Pressure Level (dB) in each Frequency Band								
	63Hz	**125Hz**	**250Hz**	**500Hz**	**1kHz**	**2kHz**	**4kHz**	**8kHz**	**dB(A)**
Background (with plant switched off)	55.7	51.2	44.9	39.7	36.7	32.9	25.3	18	43.2
Measured at 1m from Louvre of Enclosure	57.6	58.3	44.9	40	37.3	31.8	24.4	16.1	45.4
Measured at 1m from Louvre of Enclosure *With Background Subtracted*	53.1	57.4	44.9	28.2	28.4	26.4	18	13.5	43
Calculated to the nearest residential receiver 4m away *[2nd Floor]*	41.1	45.4	32.9	16.2	16.4	14.4	6.0	1.5	31

Table 4.1: Measured ambient and specific noise levels

Measurements were also taken with the plant on and off at the closest receiving position on the 3rd floor, at a distance of approximately 4m from the unit, with the plant off and in operation. Measurements are shown below in Table 4.2.

	Sound Pressure Level (dB) in each Frequency Band								
	63Hz	**125Hz**	**250Hz**	**500Hz**	**1kHz**	**2kHz**	**4kHz**	**8kHz**	**dB(A)**
Background (with plant switched off) at 5th floor receiver	55.7	51.2	44.9	39.7	36.7	32.9	25.3	18	43.2
Plant in operation at 5th floor receiver	59.9	53.8	42.6	40.4	36.5	31	25.2	20.4	43.5

Table 4.2: Plant measured on and off at closest receiver

6.2 Noise Impact Assessment for Receiver

With reference to the criteria stated in Section 3.0 and Table 4.1, measurements indicate that the requirements of the Local Authority should be met.

Measurements were also taken with the plant on and off at the closest receiving position on the 2nd floor, 4m away. As shown in Table 4.2, the overall noise level at the receiver was not increased which indicates that the noise levels of the plant was a minimum of 10dB below the background noise level.

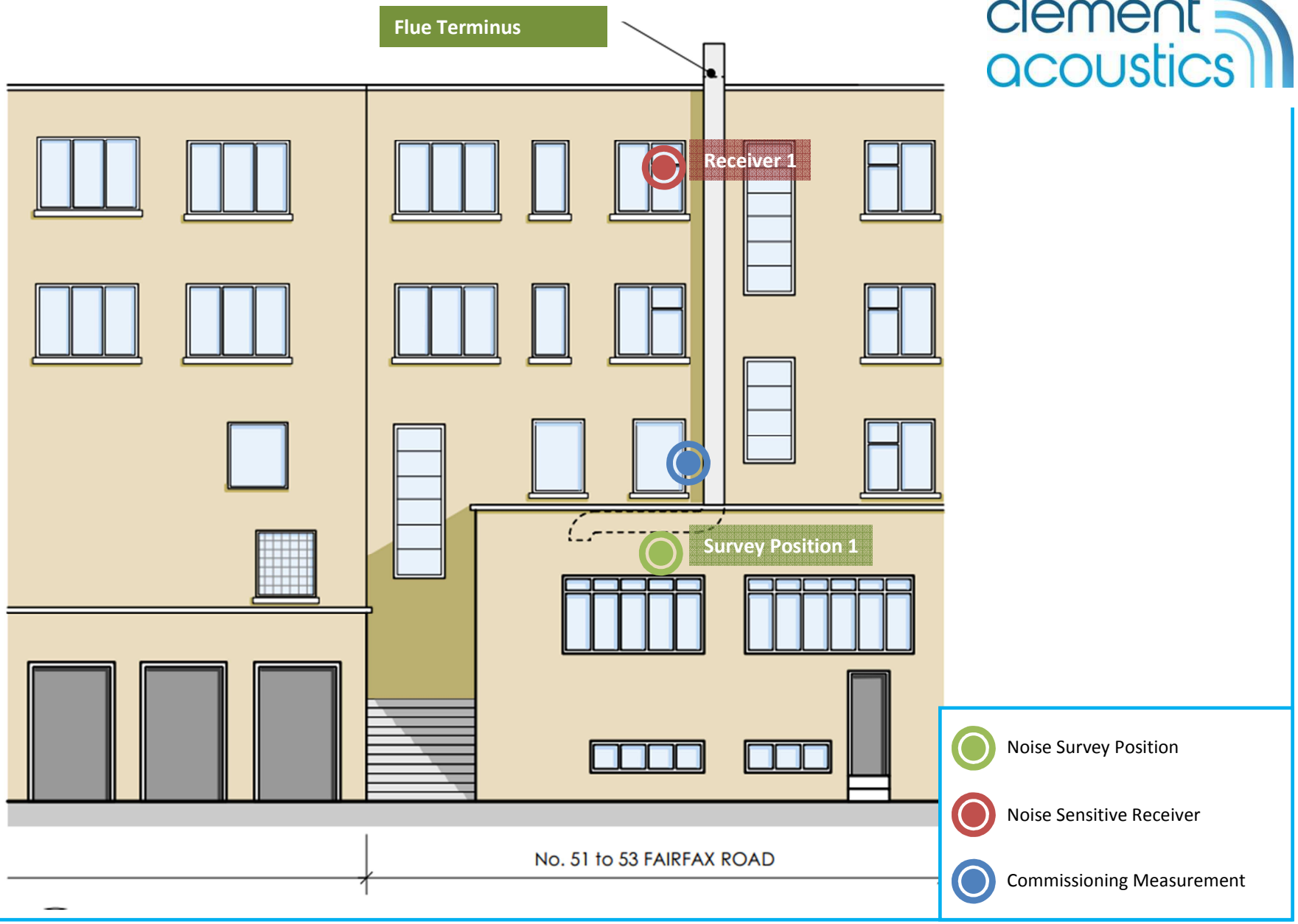
7.0 CONCLUSION

A noise impact assessment has been undertaken for an installed extractor fan at 51 Fairfax Road, London. A previously undertaken noise survey was used to set criteria for noise emissions in accordance with the requirements of the London Borough of Camden.

Manual measurements were then undertaken of the installed plant unit in order to calculate noise levels at residential windows due to the plant installation.

Measurements and calculations show that noise emissions from the condenser meet the requirements of the Local Authority provided the operation duty is not exceeded.

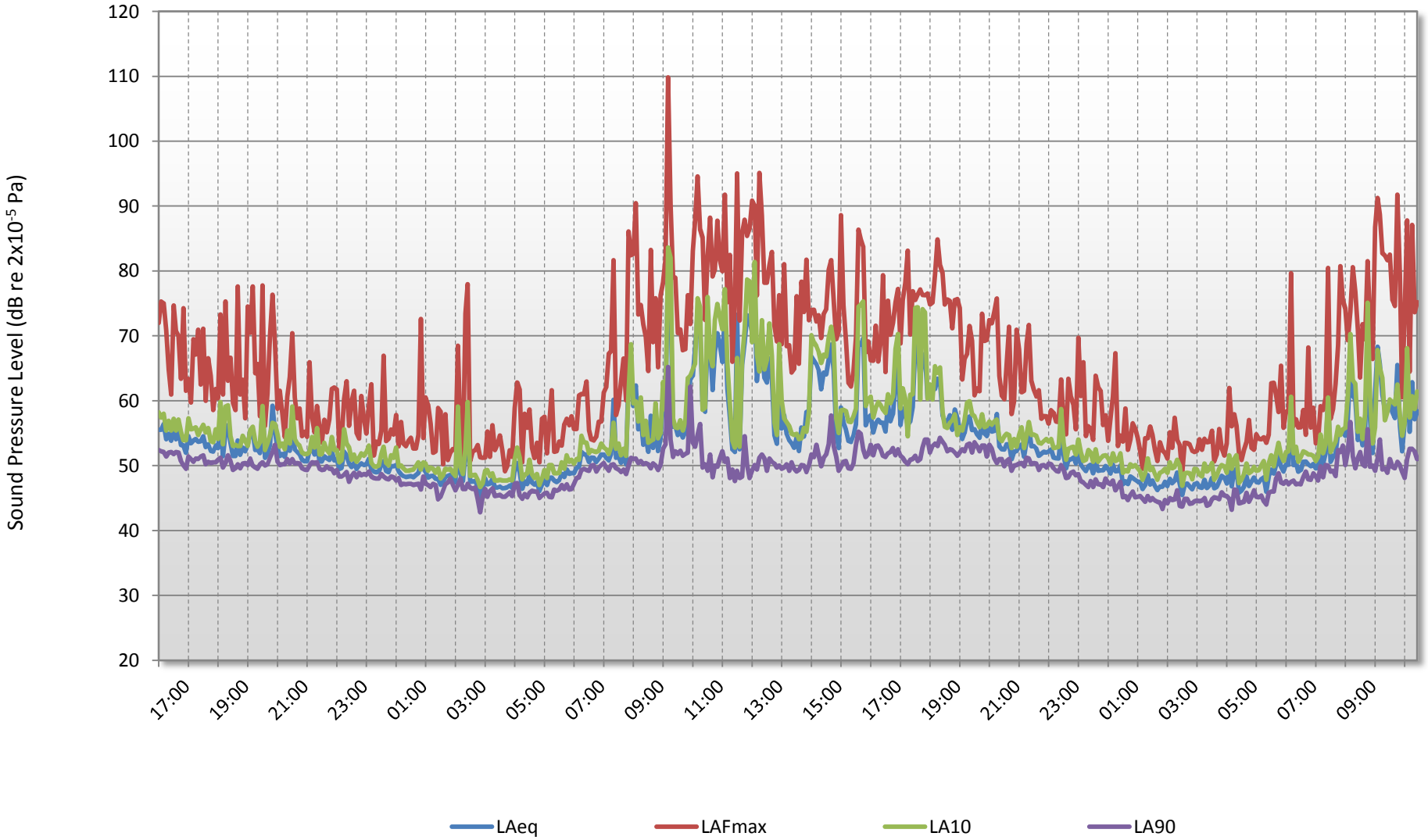
Report by	Checked by
Andrew Thomas AMIOA	**Duncan Martin MIOA**



12150-SP1 Indicative site plan indicating noise monitoring position and nearest noise sensitive receivers **Date:** 09 August 2017

51 Fairfax Road, London

Environmental Noise Time History
27 February to 1 March 2017



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.