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HALF CUP, 100-102 JUDD STREET, LONDON

NOISE IMPACT ASSESSMENT

Report **13274-NIA-01**

Prepared on 21 March 2018

Issued For:

Kumari Morar

100-102 Judd Street

London

WC1H 9NT

Company registered in England & Wales no. 07958744 - UKAS accreditation is only applicable to sound insulation testing services

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1.0 INTRODUCTION

Clement Acoustics has been commissioned by Kumari Morar to measure existing background noise levels at 100-102 Judd 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 and outlines any necessary mitigation measures.

2.0 SITE DESCRIPTION

Current proposals are to install a single Helios GBD 450/4/4 T120 kitchen extract fan internally with the duct terminating at the front of the property.

The first floor flat above the café which is approximately 2m above the assumed duct termination has been identified as the nearest affected receiver. This nearest noise sensitive receiver was identified through observations on-site. If there are any receivers closer to that identified within this report then a further assessment may need to be carried out. Therefore, the closest noise sensitive receptor should be confirmed by Kumari Morar before the plant is installed or any noise mitigation measures are implemented.

Locations are shown in attached site plan 13274-SP1.

3.0 ENVIRONMENTAL NOISE SURVEY

3.1 Procedure

Measurements were undertaken at one position as shown on indicative site drawing 13274-SP1. The choice of this position was based both on accessibility and on collecting representative noise data in relation to the site.

The microphone was mounted on a tripod at street level at the front of the building. The position was considered to be free-field according to guidance found in BS4142:2014, and a correction for reflections has therefore not been applied. Noise levels at the monitoring position were dominated by traffic noise during the manned measurements.

Manned measurements were undertaken for the duration of the survey between 1st March 2018 from 11:10 – 12:55. As access to a secure monitoring position was not available a longer, unmanned survey was not possible. A shorter, manned survey over the quietest part of the day was considered to be a suitable method of obtaining representative minimum noise levels representative of the receiver. This methodology was agreed by the local authority.

Weather conditions were cold and snowy but with no strong winds or rain and were therefore considered suitable for the measurement of environmental noise.

The measurement procedure generally complied with BS 7445:1991: '*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 13274-SP1.

The measured noise levels are shown as a time history in Figure 13274-TH1, with ambient and background noise levels summarised in Table 4.1.

	Average ambient noise level $L_{eq:\ T}$ dB(A)	**Minimum background noise level $L_{90:\ 5min}$ dB(A)**
Daytime (07:00 - 23:00)	69 dB(A)	53 dB(A)

Table 4.1: Minimum background noise levels

5.0 NOISE CRITERIA

It is understood that the proposed plant unit will be operational between 08:00 and 19:00. We therefore propose to set the noise criteria at 43 dB(A), the value 10 dB below the minimum measured background noise level during the day time hours.

6.0 NOISE IMPACT ASSESSMENT

6.1 Proposed Installation

The proposed plant installation comprises the following:

- 1 No. Helios GBD 450/4/4 T120

Noise emissions for the proposed plant units, as provided by the manufacturer, are shown in Table 6.1. Loudest modes of operation have been used in order to present a robust worst case assessment.

	A-Weighted Sound Power Levels (dB) in each Frequency Band								
Unit	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dB(A)
Hellios GBD 450/4/4 T120	65*	67	68	70	76	75	72	59	80

Table 6.1: Manufacturer Noise Emissions Levels

**Where data is not provided in certain frequency bands, known data has been extrapolated.*

The proposed plant location is internally within the ground floor kitchen with the duct terminating at the front of the building which is shown on indicative site plan 13274-SP1.

The closest receiver has been identified as the window on the front facade of a residential property opposite which is a minimum of 2m from the proposed plant location as shown on indicative site plan 13274-SP1.

6.2 Proposed Mitigation Measures

In order to meet the proposed criteria stated in Section 5.0, it is recommended that an inline silencer is installed. The silencer should provide sufficient attenuation to achieve a maximum sound pressure level of 40dB(A) when measured at 1 m in all directions.

Based on the information provided, an enclosure meeting the sound reduction indices as stated in Table 6.2 should be suitable to achieve this.

	Required Attenuation (dB) in each Frequency Band							
Mitigation	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
In-line Silencer	-18	-29	-32	-46	-50	-48	-48	-46

Table 6.2: Required Attenuation from Mitigation

6.3 Noise Impact Assessment

Taking into account all necessary acoustic corrections, the resulting noise level at the identified residential windows would be as shown in Table 6.3. Detailed calculations are shown in Appendix B.

Receiver	Day Time Hours Criterion	Noise Level at Receiver (due to proposed plant)
Nearest Residential Property	43 dB(A)	43 dB(A)

Table 6.3: Noise levels and criteria at noise sensitive receivers

As presented in Table 6.3 and Appendix B, the proposed plant installation with acoustic enclosure would be expected to meet the requirements of the proposed criteria.

6.4 British Standard Requirements

Further calculations have been undertaken to assess whether the noise emissions from the proposed plant unit would be expected to meet recognised British Standard recommendations, in order to further ensure the amenity of nearby noise sensitive receivers.

British Standard 8233:2014 '*Guidance on sound insulation and noise reduction for buildings*' gives recommendations for acceptable internal noise levels in residential properties. Assuming worst case conditions, of the closest window being for a bedroom, BS 8233:2014 recommends 30dB(A) as being acceptable internal resting/sleeping conditions during night-time.

With loudest external levels of 43dB(A), the window would need to provide a minimum of 13dB attenuation for recommended internal levels to be met. According to BS 8233:2014, a typical building facade with a partially open window offers 15 dB attenuation.

It can therefore be predicted that, in addition to meeting the requirements of the set criteria, the emissions from the proposed plant would be expected to meet the most stringent recommendations of the relevant British Standard, with neighbouring windows partially open. Predicted levels are shown in Table 6.4.

Receiver	Recomended Target – *For resting/sleeping conditions in a bedroom, in BS8233:2014*	Noise Level at Receiver (due to plant installation)
Inside Residential Window	30 dB(A)	28 dB(A)

Table 6.4: Noise levels and criteria inside nearest residential space

7.0 CONCLUSION

An environmental noise survey has been undertaken at 100-102 Judd 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.

A noise impact assessment has then been undertaken using manufacturer noise data to predict the noise levels, due to the proposed plant, at the nearby noise sensitive receivers.

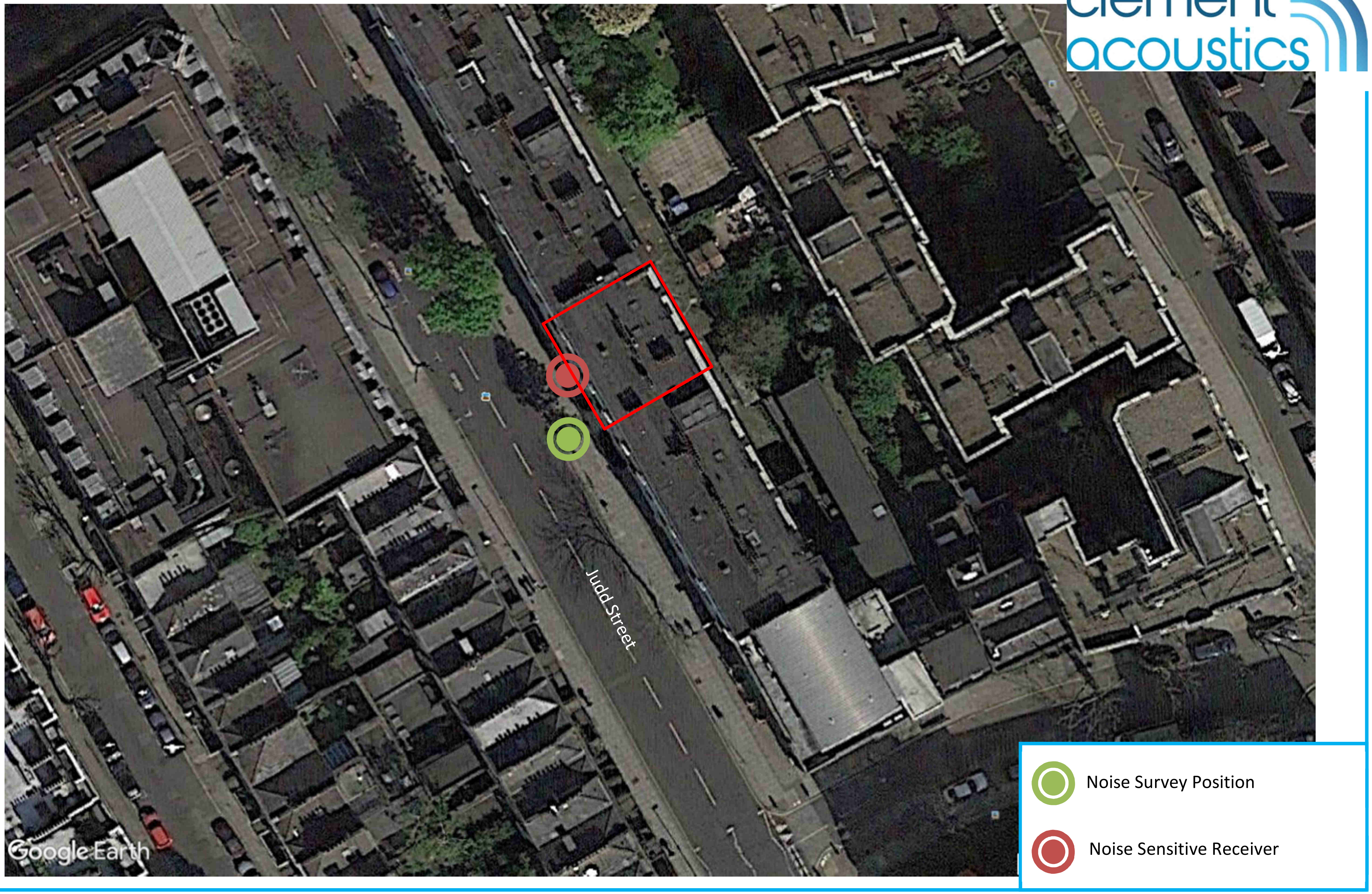
Calculations show that noise emissions from the proposed plant units should meet the requirements of the London Borough of Camden with the recommended mitigation installed as stated herein.

Report by

Lewis Hart AMIOA

Checked by

Matt Markwick AMIOA

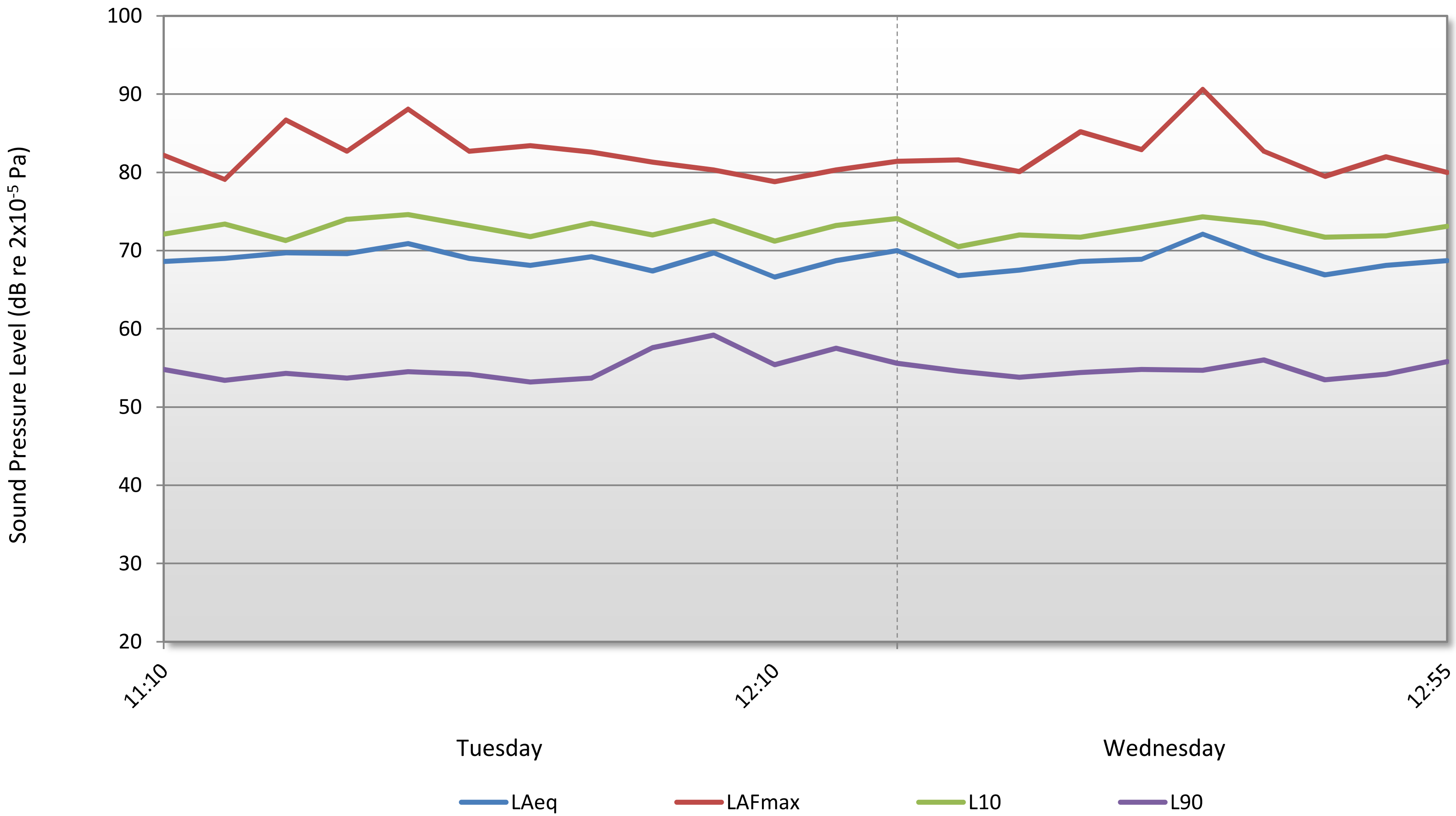


13274-SP1 Indicative site plan indicating noise monitoring position and nearest noise sensitive receiver

Date: 21 March 2018

Half Cup, 100-102 Judd Street, London

Environmental Noise Time History
1 March 2018



13274-TH1

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.

APPENDIX B

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Half Cup, 100-102 Judd Street, London

EXTERNAL PLANT NOISE EMISSIONS CALCULATION

Receiver: Nearest Residential Receiver
Source: Proposed plant installation

	Frequency, Hz								
	63	*125*	*250*	*500*	*1k*	*2k*	*4k*	*8k*	*dB(A)*
Manufacturer provided sound pressure level at 1 metre Hellios GBD 450/4/4 T120 (Extract) *A-Weighting removed*	91	83	77	73	76	74	71	60	81
Correction for duct fitting (assuming a straight duct), dB	-2	-2	-7	-8	-10	-12	-15	-19	
Correction for reflections, dB	-8	-8	-8	-8	-8	-8	-8	-8	
Distance correction to receiver, dB (2m)	6	6	6	6	6	6	6	6	
Inline Silencer, dB	-18	-29	-32	-46	-50	-49	-48	-46	
Sound pressure level at receiver	**69**	**50**	**36**	**17**	**14**	**11**	**6**	**0**	**43**

Design Criterion	**43**

BS 8233 ASSESSMENT CALCULATION

Receiver: Inside Nearest Residential Window
Source: Proposed plant installation

	Frequency, Hz								
	63	*125*	*250*	*500*	*1k*	*2k*	*4k*	*8k*	*dB(A)*
Sound pressure level outside window	69	50	36	17	14	11	6	0	43
Minimum attenuation from partially open window, dB	-15	-15	-15	-15	-15	-15	-15	-15	
Sound pressure level inside nearest noise sensitive premises	**54**	**35**	**21**	**2**	**-1**	**-4**	**-9**	**-15**	**28**

Design Criterion	**30**