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acoustics

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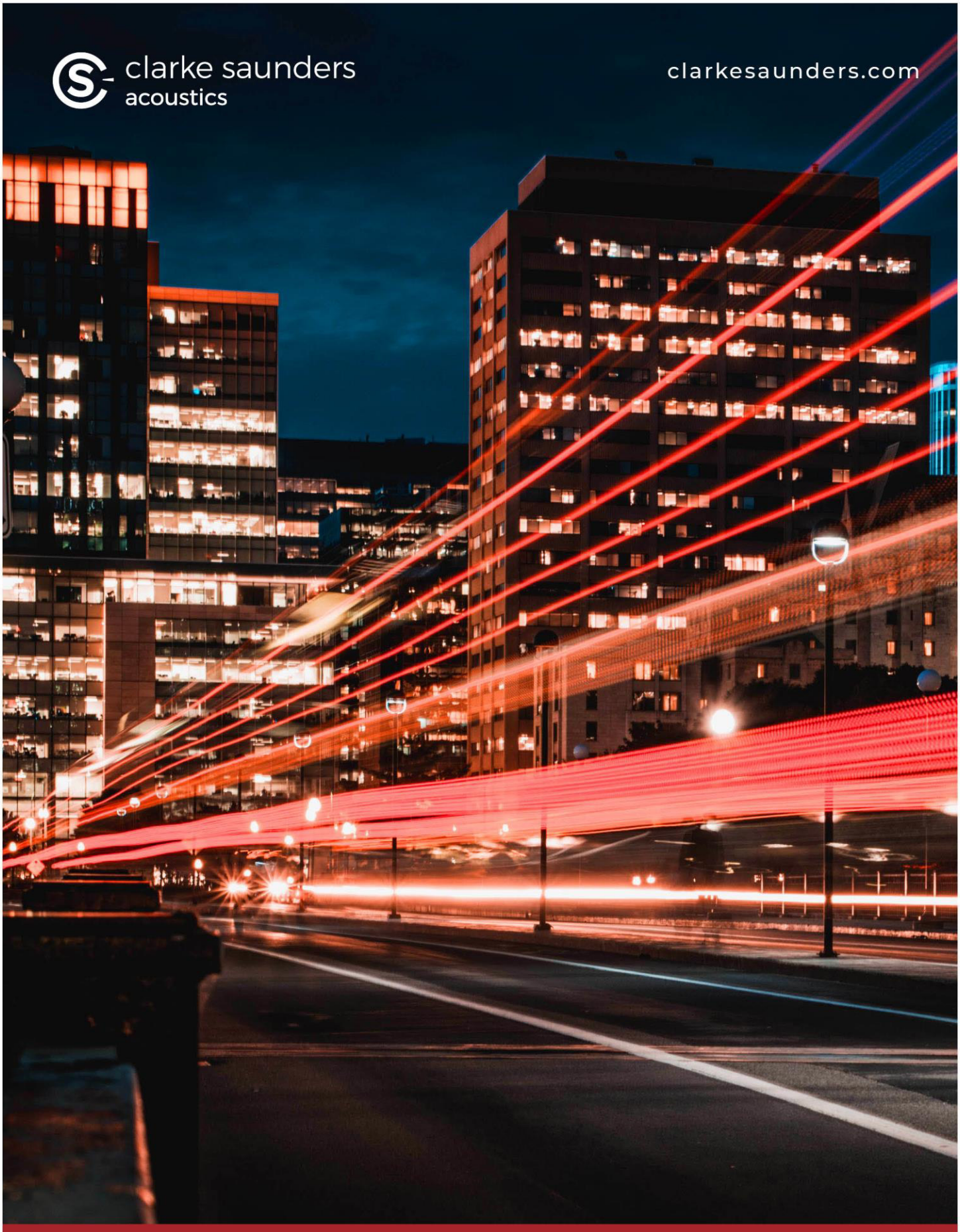


PREPARED: Thursday, 03 September 2020

14 Endsleigh Street;

PLANNING COMPLIANCE REPORT

CONTENTS

LIST OF ATTACHMENTS

Project Ref:	AS11809	**Title:**	14 Endsleigh Street
Report Ref:	AS11809.200819.PCR.R3	**Title:**	Planning Compliance Report
Client Name:	Overbury PLC		
Project Manager:	Alex Brooker		
Report Author:	Alec Korchev		

Clarke Saunders Acoustics
Winchester SO22 5BE

1.0 INTRODUCTION

1.1 Planning approval is being sought for the installation of new plant at ground floor level at 14 Endsleigh Street, London, WC1H 0DH (the Site).

1.2 Clarke Saunders Acoustics (CSA) has been commissioned by Overbury Eos to undertake a mechanical plant noise assessment for planning compliance in accordance with the planning requirements of London Borough of Camden (LBC) for the installation of a new extract fan and associated ductwork to be installed in the rear garden of the Site.

1.3 This report describes the assessment undertaken, including calculations, and its findings.

1.4 A glossary relevant to the terminology used in this report is presented in Appendix A.

2.0 SITE DESCRIPTION

2.1 New building services plant is to be installed in the rear garden of the Site.

2.2 The Site is mostly surrounded by residential developments. Following an inspection of the site, the nearest noise sensitive receptors are found to be at the rear of John Adams Hall, a student accommodation at 15-23 Endsleigh Street. These are indicated on the indicative site plan AS11809/SP1.

3.0 LOCAL AUTHORITY REQUIREMENTS

3.1 Camden Council adopted their Local Plan on 3 July 2017 which describes 'noise thresholds' in Appendix 3 of the document.

3.2 Survey measurement procedures for fixed plant noise assessments and determination of the typical background noise level should follow the methodology set out in BS4142:2014 *Methods for rating and assessing industrial and commercial sound*. The subsequent assessment of fixed plant noise emissions does not need to be in accordance with BS4142:2014 where character penalties could be imposed. Instead the policy requires the plant noise emissions at the nearest residential receptor to be 10 dB below the typical background ($L_{A90,15min}$) during the proposed operational period or 15 dB below the typical background ($L_{A90,15min}$) during the proposed operational period if tonal.

3.3 Due to the exceptional circumstances currently being experienced in London and the UK with regards to the COVID-19 pandemic, the usual approach for environmental noise assessments may not be appropriate on its own. An alternative approach following guidance issued by the Associated of Noise Consultants/Institute of Acoustics and in liaison with LBC has been applied.

3.4 LBC Senior Planning Officer Laura Hazelton, in correspondence dated 10th August 2020, following a discussion with the LBC EHO, confirmed that the use of CSA's 2019 background survey data from the first-floor east window of 36-38 Gordon Place, Bloomsbury, London, WC1H 0PD, would be an acceptable alternative for assessment of this application.

4.0 SURVEY PROCEDURE & EQUIPMENT

4.1 A survey of existing noise levels was undertaken at rear first floor level of 36-38 Gordon Square, WC1H 0PD, at the position shown in the attached site plan AS11809/SP1. Measurements of consecutive 5-minute L_{Aeq}, L_{Amax}, L_{A10} and L_{A90} sound pressure levels were taken between 16:25 hours on Thursday 31st October and 12:20 hours on Monday 4th November 2019.

4.2 The following equipment was used during the course of the survey:

- 1 no. Svantek Sound Level Meter type 958;
- 1 no. Rion sound level calibrator type NC-74.

4.3 The calibration of the sound level meter was verified before and after use. No significant calibration drift was detected.

4.4 The noise climate at the Site has been observed during installation and collection of the unattended noise monitor and is primarily determined by road traffic noise from the surrounding road network, and existing plant.

4.5 The weather during the survey was noted onsite. Conditions were dry with light winds which made the conditions suitable for environmental noise measurements.

4.6 Measurements were made generally in accordance with ISO 1996-2:2007 *Acoustics - Description, measurement and assessment of environmental noise* – Part 2: *Determination of environmental noise levels*.

5.0 RESULTS

5.1 Figures AS11809/TH1-TH4 show the L_{Aeq}, L_{Amax}, L_{A10} and L_{A90} sound pressure levels as time histories at the automated survey position.

5.2 Both the application Site and 36-38 Gordon Square were visited to validate the results of the 2019 survey on 13 August 2020. Notwithstanding the current circumstances outlined above, we are satisfied that this noise data can be considered representative of the noise climate at the application site for the purposes of this assessment.

5.3 Results measured in 2019 are in façade conditions, no free-field correction has been applied.

MONITORING PERIOD	TYPICAL $L_{A90,5MINS}$
07:00-23:00 Hours	50 dB
23:00-07:00 Hours	48 dB

Minimum measured background and average noise levels [dB ref. 20µPa]

5.4 It is not expected that tonal noise will be generated by the proposed plant unit. The plant noise emission limits when measured at 1 metre away from the façade of the nearest noise sensitive receptors are detailed in the table below.

DAYTIME (07:00 - 23:00 HOURS)	NIGHT-TIME (23:00 - 07:00 HOURS)
L_{Aeq} 40 dB	L_{Aeq} 38 dB

Proposed plant noise limits [dB ref. 20µPa]

6.0 PREDICTED NOISE IMPACT

6.1 PROPOSED PLANT

6.2 The selected plant has been confirmed as 1 no. SystemAir Prio 250EC circ Duct Fan, an extract fan to be located outdoors in the lower level rear garden. The approximate location of the plant to be installed is shown in site plan AS11809/SP1.

6.3 Case-radiated sound power levels generated by the building services plant component have been confirmed by the manufacturer as presented below.

TYPE	63	125	250	500	1K	2K	4K	8K	dB(A)
SystemAir Prio 250EC Breakout	<10	24	35	42	44	40	30	14	48

Source noise data (L_w) [dB ref. 20µPa.]

6.4 It is noted that the building services plant includes an atmospheric discharge vent, which will be attenuated at the later acoustic design stage so that the cumulative plant noise criteria outlined above are achieved at the nearest noise sensitive receptor.

6.5 PREDICTED NOISE LEVELS

6.6 The nearest noise sensitive receptor, a residence at the rear of 15-23 Endsleigh Street, is located circa 2.5 metres to the north, approximately 3 metres higher, and partially screened by the roof edge of 15-23 Endsleigh Street, in relation to the proposed plant.

6.7 Analysis of the noise data indicates noise emissions from the plant would be compliant with the 24-hour criteria for the noise-sensitive receptor.

6.8 The overall prediction is given in the table below, with the design criterion.

PERIOD	PREDICTED NOISE LEVELS AT THE REAR OF 15-23 ENDSLEIGH STREET	CRITERIA
07:00-23:00 Hours	23 dB(A)	40 dB(A)
23:00-07:00 Hours	23 dB(A)	38 dB(A)

Predicted noise level at nearest noise sensitive location [dB ref. 20µPa]

6.9 A summary of the calculations is shown in Appendix B.

7.0 CONCLUSION

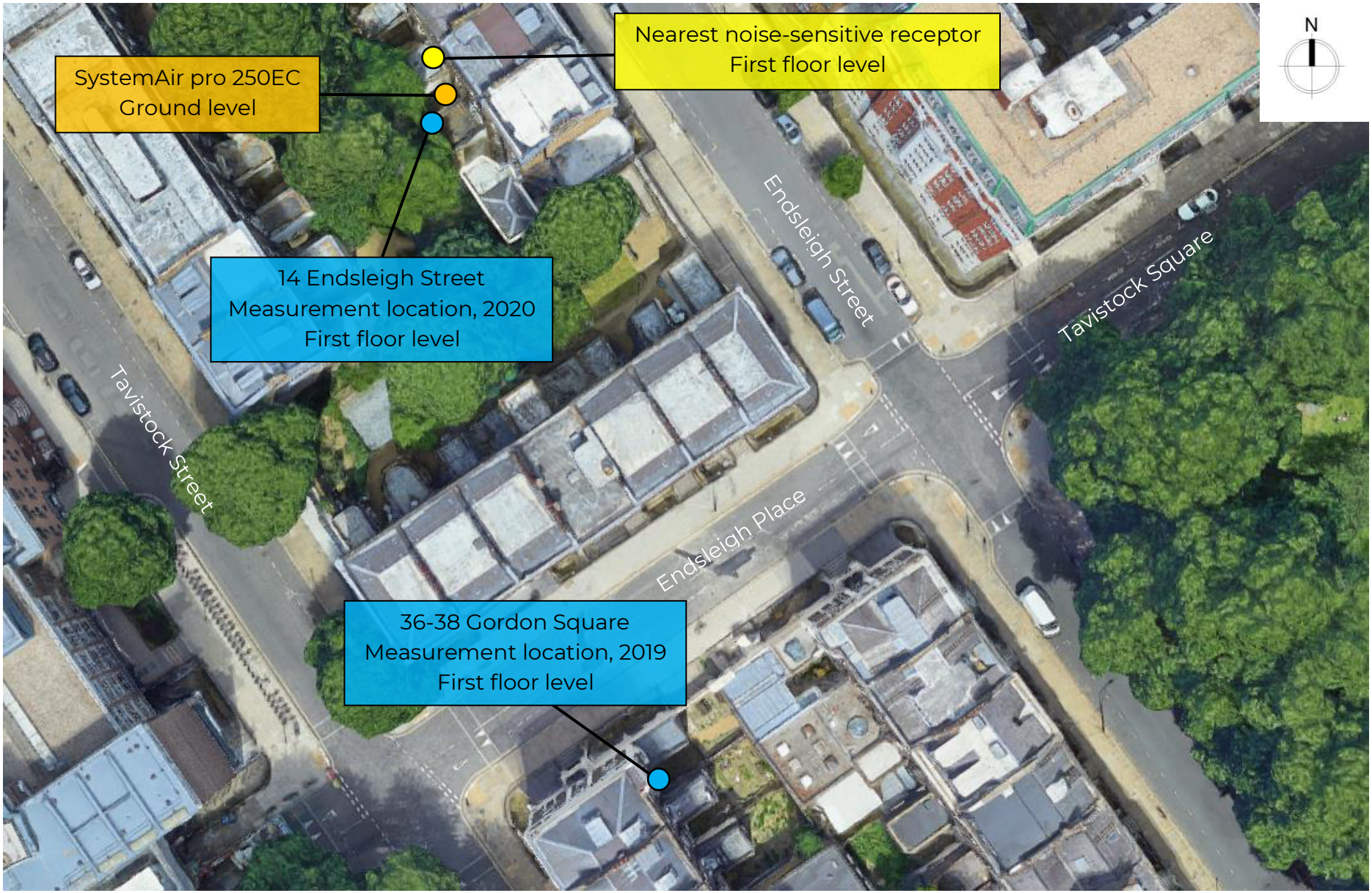
7.1 A noise assessment has been undertaken to demonstrate planning compliance in accordance with the planning requirements of London Borough of Camden for the installation of new building services plant in the rear garden of 14 Endsleigh Street.

7.2 Results from an environmental noise survey, undertaken at 36-38 Gordon Square, London by Clarke Saunders Acoustics, have been utilised to establish the background noise climate. This data was supplemented by manual measurements taken on 13th August 2020 at the application site to establish validity. This has enabled noise limits for the control of plant noise emissions to noise sensitive properties in accordance with London Borough of Camden requirements.

7.3 Case-radiated breakout data for the new SystemAir air extraction fan has been used to predict the noise impact of the new plant on neighbouring residential properties.

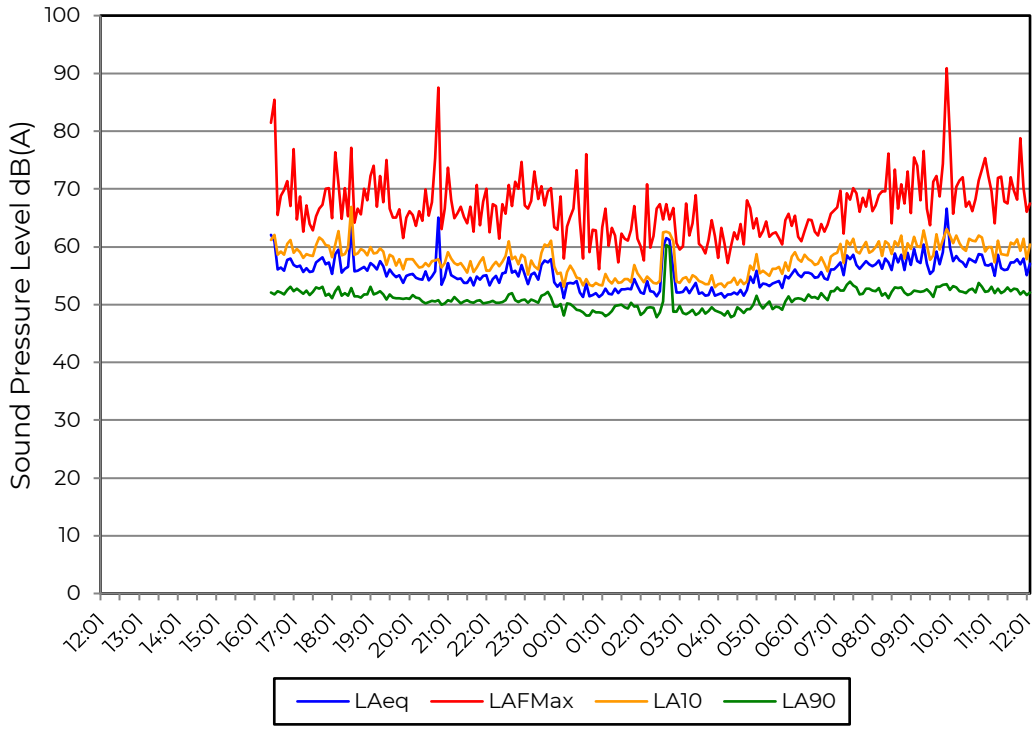
7.4 Accounting for screening effects between the plant location and the receptor provided by the existing building and distance losses, compliance with the noise emission design criterion has been demonstrated.

Alec Korchev AMIOA
CLARKE SAUNDERS ACOUSTICS


Nearest noise-sensitive receptor
First floor level
SystemAir pro 250EC
Ground level
14 Endsleigh Street
Measurement location, 2020
First floor level
36-38 Gordon Square
Measurement location, 2019
First floor level
Endsleigh Street
Tavistock Square
Tavistock Street
Endsleigh Place
N

36-38 Gordon Square, London

Environmental Noise Time History

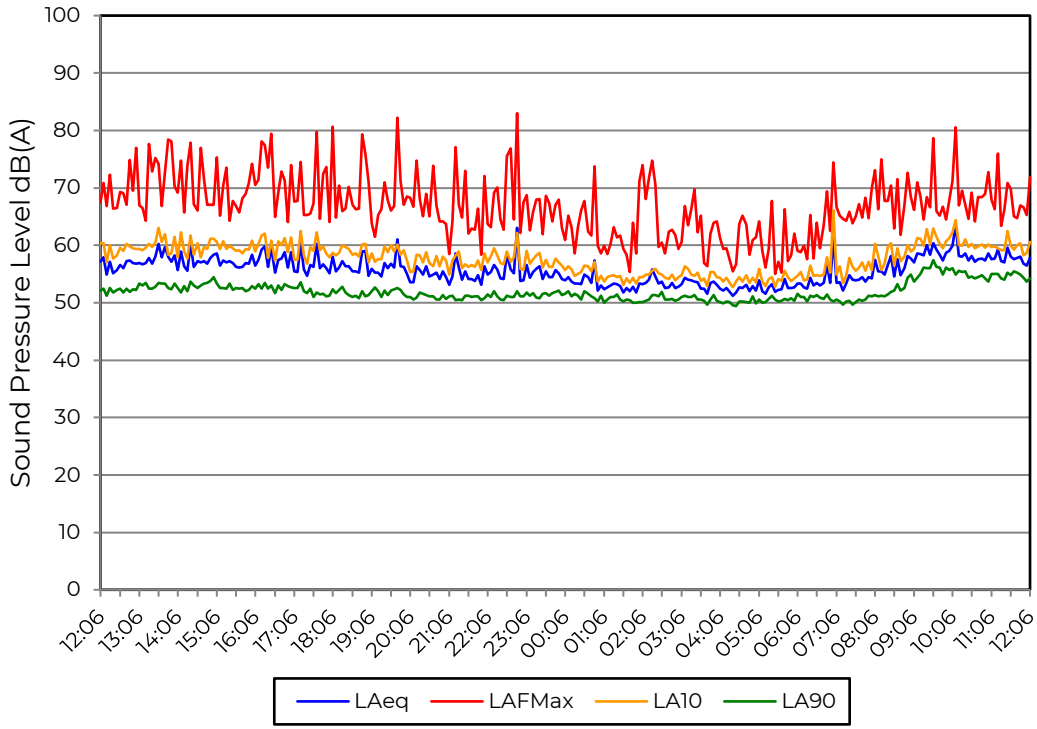


Thursday 31 October to Friday 01 November 2019

Figure AS11809/TH1

36-38 Gordon Square, London

Environmental Noise Time History

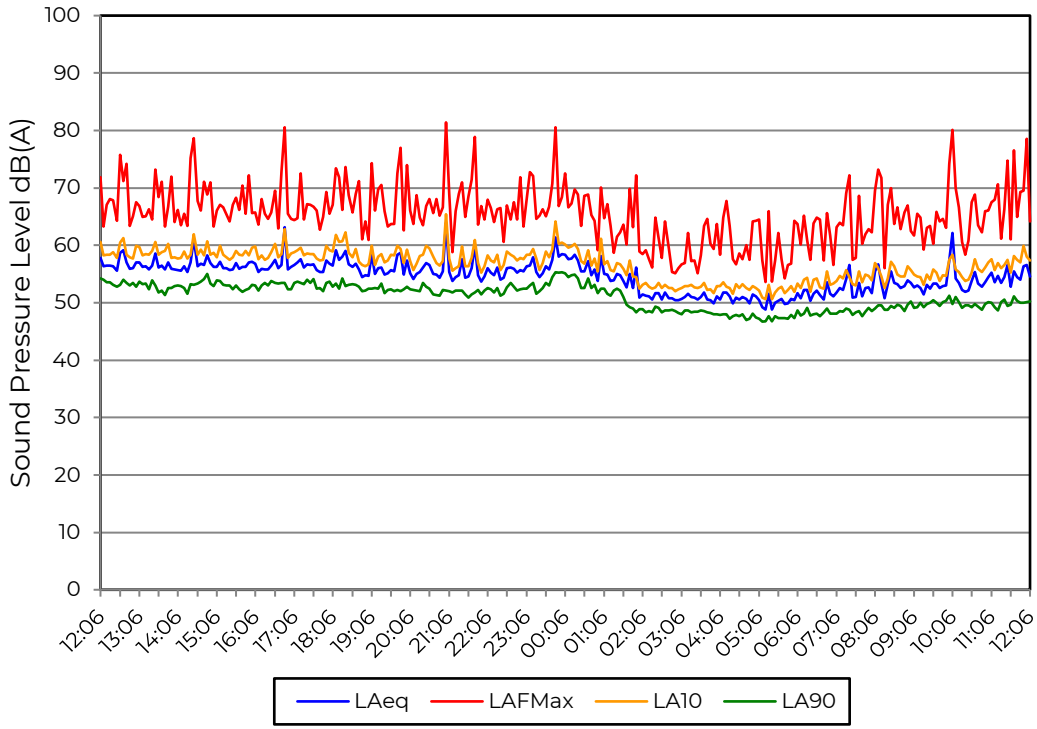


Friday 01 November to Saturday 02 November 2019

Figure AS11809/TH2

36-38 Gordon Square, London

Environmental Noise Time History

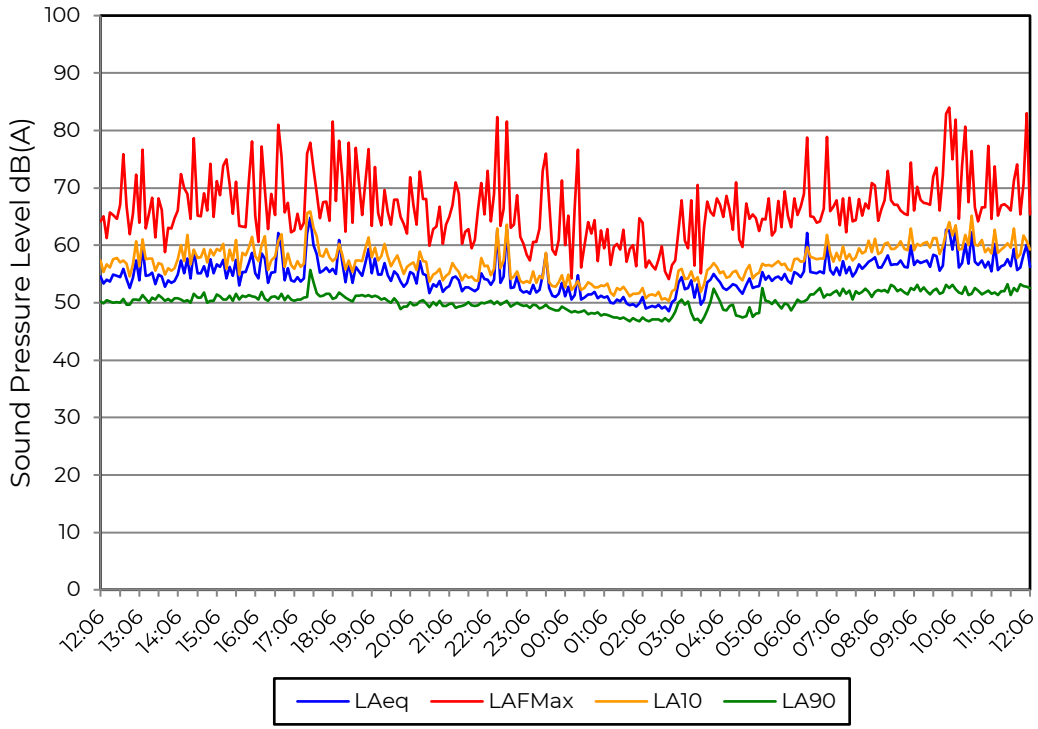


Saturday 02 November to Sunday 03 November 2019

Figure AS11809/TH3

36-38 Gordon Square, London

Environmental Noise Time History



Sunday 03 November to Monday 04 November 2019

Figure AS11809/TH4

APPENDIX A

1.1 Acoustic Terminology

The human impact of sounds is dependent upon many complex interrelated factors such as 'loudness', its frequency (or pitch) and variation in level. In order to have some objective measure of the annoyance, scales have been derived to allow for these subjective factors.

Sound Vibrations propagating through a medium (air, water, etc.) that are detectable by the auditory system.

Noise Sound that is unwanted by or disturbing to the perceiver.

Frequency The rate per second of vibration constituting a wave, measured in Hertz (Hz), where 1Hz = 1 vibration cycle per second. The human hearing can generally detect sound having frequencies in the range 20Hz to 20kHz. Frequency corresponds to the perception of 'pitch', with low frequencies producing low 'notes' and higher frequencies producing high 'notes'.

dB(A): Human hearing is more susceptible to mid-frequency sounds than those at high and low frequencies. To take account of this in measurements and predictions, the 'A' weighting scale is used so that the level of sound corresponds roughly to the level as it is typically discerned by humans. The measured or calculated 'A' weighted sound level is designated as dB(A) or L_A.

L_{eq}: A notional steady sound level which, over a stated period of time, would contain the same amount of acoustical energy as the actual, fluctuating sound measured over that period (e.g. 8 hour, 1 hour, etc).

The concept of L_{eq} (equivalent continuous sound level) has primarily been used in assessing noise from industry, although its use is becoming more widespread in defining many other types of sounds, such as from amplified music and environmental sources such as aircraft and construction.

Because L_{eq} is effectively a summation of a number of events, it does not in itself limit the magnitude of any individual event, and this is frequently used in conjunction with an absolute sound limit.

L_{10} & L_{90}: Statistical L_n indices are used to describe the level and the degree of fluctuation of non-steady sound. The term refers to the level exceeded for n% of the time. Hence, L_{10} is the level exceeded for 10% of the time and as such can be regarded as a typical maximum level. Similarly, L_{90} is the typical minimum level and is often used to describe background noise.

It is common practice to use the L_{10} index to describe noise from traffic as, being a high average, it takes into account the increased annoyance that results from the non-steady nature of traffic flow.

1.2 Octave Band Frequencies

In order to determine the way in which the energy of sound is distributed across the frequency range, the International Standards Organisation has agreed on "preferred" bands of frequency for sound measurement and analysis. The widest and most commonly used band for frequency measurement and analysis is the Octave Band. In these bands, the upper frequency limit is twice the lower frequency limit, with the band being described by its "centre frequency" which is the average (geometric mean) of the upper and lower limits, e.g. 250 Hz octave band extends from 176 Hz to 353 Hz. The most commonly used octave bands are:

Octave Band Centre Frequency Hz	63	125	250	500	1000	2000	4000	8000

1.3 Human Perception of Broadband Noise

Because of the logarithmic nature of the decibel scale, it should be borne in mind that sound levels in dB(A) do not have a simple linear relationship. For example, 100dB(A) sound level is not twice as loud as 50dB(A). It has been found experimentally that changes in the average level of fluctuating sound, such as from traffic, need to be of the order of 3dB before becoming definitely perceptible to the human ear. Data from other experiments have indicated that a change in sound level of 10dB is perceived by the average listener as a doubling or halving of loudness. Using this information, a guide to the subjective interpretation of changes in environmental sound level can be given.

INTERPRETATION

Change in Sound Level dB	Subjective Impression	Human Response
0 to 2	Imperceptible change in loudness	Marginal
3 to 5	Perceptible change in loudness	Noticeable
6 to 10	Up to a doubling or halving of loudness	Significant
11 to 15	More than a doubling or halving of loudness	Substantial
16 to 20	Up to a quadrupling or quartering of loudness	Substantial
21 or more	More than a quadrupling or quartering of loudness	Very Substantial

APPENDIX B

AS11809 14 Endsleigh Street

Plant Noise Assessment

Plant noise emission @ Receptor	Frequency, Hz								dB(A)
	63	125	250	500	1K	2K	4K	8K	
SystemAir 250EC Breakout Lw(A)	10	24	35	42	44	40	30	14	47
- Corrected for A-weighting	36	40	44	45	44	39	29	15	
- Corrected for Lp @ 1m	28	32	36	37	36	31	21	7	39
Distance propagation effect 4m	-12	-12	-12	-12	-12	-12	-12	-12	
Building edge partial screening	-5	-5	-5	-5	-5	-5	-5	-5	
Total Lp, dB	11	15	19	20	19	14	4	-10	23

Total Lp at Receptor	11	15	19	20	19	14	4	-10	23

Daytime criterion at residential receptors **40 dB(A)**

Night-time criterion at residential receptors **38 dB(A)**