Facebook
42 Earlham Street
London

ENVIRONMENTAL NOISE SURVEY
& PLANT NOISE ASSESSMENT
REPORT 18191/PNA1

For:

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1.0 INTRODUCTION

A new kitchen extract fan has been proposed at Facebook, 42 Earlham Street, London. Hann Tucker Associates have therefore been commissioned to undertake an environmental noise survey and plant noise assessment.

This report presents the survey methodology and findings. The survey data has been used as the basis for various acoustic assessment purposes.

2.0 OBJECTIVES

To establish, by means of detailed 24 hour daytime and night-time fully automated environmental noise monitoring, the existing A-weighted (dBA) L_{10}, L_{90}, L_{eq} and L_{max} environmental noise levels at a selected accessible first floor level position on site, thought to be representative of the nearest affected property.

To measure L_{eq}, L_{90} and L_{max} octave band spectra noise levels for typical daytime and night-time periods at the measurement position in order to obtain a more detailed description of the noise climate.

Based on the results of the noise survey, and in conjunction with the Local Authority, to recommend suitable plant noise emission criteria.

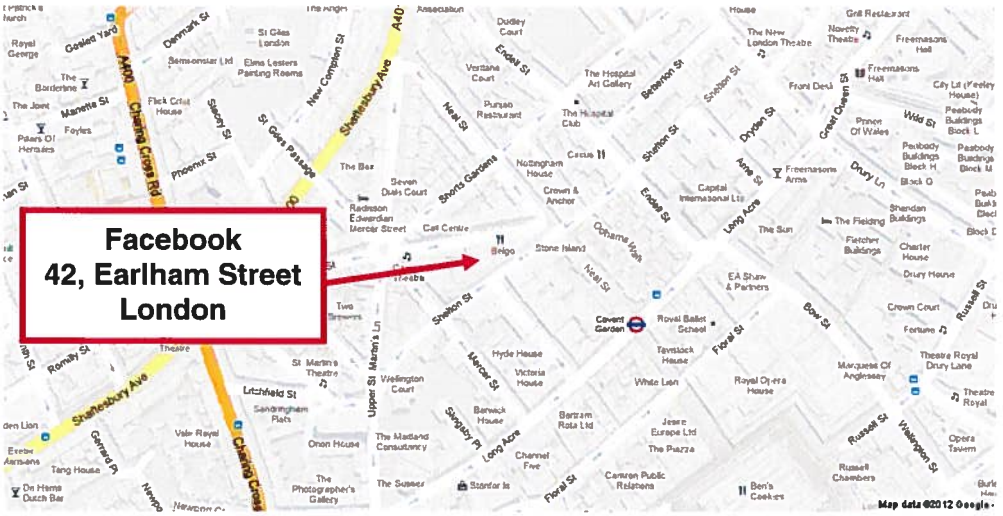
To assess the proposed plant and comment on its acceptability.

These objectives are as set out in our letter dated 30 March 2012 and written instructions received on 10 April 2012.

3.0 SITE DESCRIPTION

3.1 Location

The site is located at 42 Earlham Street, London and falls within London Borough of Camden's jurisdiction. See Location Map below.



Location Map (maps.google.co.uk)

3.2 Description

The site is located on the south side of Earlham Street and is bounded by Shelton Street to the south east. See Site Plan below.

Site Plan (maps.google.co.uk)

4.0 ACOUSTIC TERMINOLOGY

For an explanation of the acoustic terminology used in this report please refer to Appendix A enclosed.

5.0 METHODOLOGY

5.1 Procedure

Fully automated environmental noise monitoring was undertaken from approximately 11:15 hours on Tuesday 10 April 2012 to 11:15 hours on Wednesday 11 April 2012.

Due to the nature of the survey, i.e. unmanned, it is not possible to accurately comment on the weather conditions throughout the entire survey period. However at the beginning and end of the survey period the wind conditions were calm and the sky was generally clear. We understand that generally throughout the survey period the weather conditions were similar to these and are considered suitable for obtaining representative measurement results.

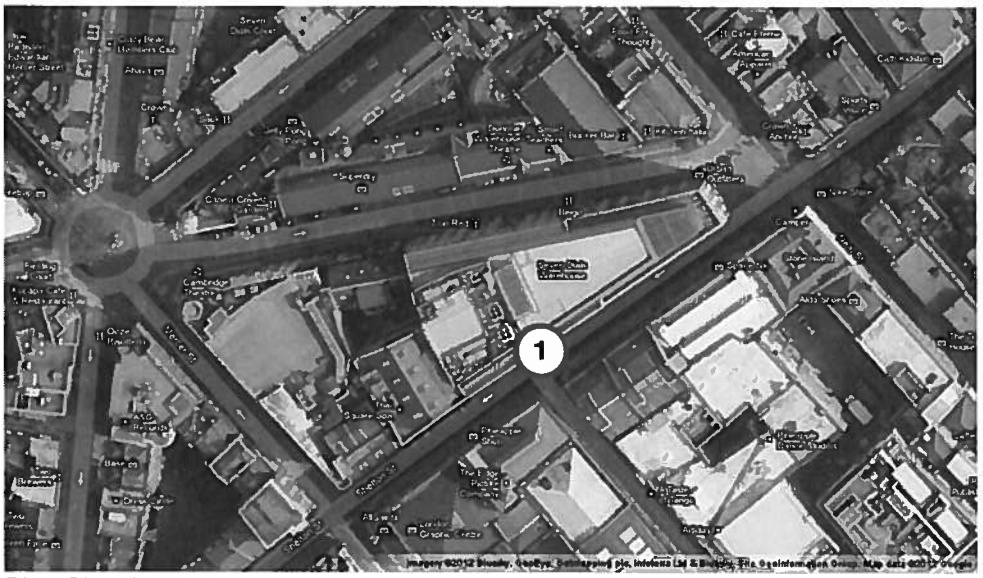
Measurements were taken continuously of the A-weighted (dBA) L_{10}, L_{90}, L_{eq} and L_{max} sound pressure levels over 15 minute periods.

5.2 Measurement Position

The noise level measurements were undertaken at 1No. position at the site.

The microphone was attached to a pole and positioned at first floor level overlooking Shelton Street. The microphone was approximately 5m above ground level and away from all reflecting surfaces.

The position was selected in order to assess the lowest noise levels at the development site for subsequent use in setting plant noise emission criteria and is shown on the plan below.



Plan Showing Unmanned Measurement Positions (maps.google.co.uk)

5.3 Instrumentation

The instrumentation used during the survey is presented in the Table below:

Description	Manufacturer	Type	Serial Number	Latest Verification
Type 1 Data Logging Sound Level Meter	Larson Davis	824	3841	LD calibration on 27/09/2010
Type 1 ½" Condenser Microphone	Larson Davis	377B02	108290	LD calibration on 27/09/2010
Type 1 Calibrator	Larson Davis	CAL200	3082	LD calibration on 02/03/2012

The sound level meter, including the extension cable, was calibrated prior to and on completion of the survey. No significant change was found to have occurred (no more than 0.1dB).

The sound level meter was located in an environmental case with the microphone connected to the sound level meter via an extension cable. The microphone was fitted with a Larson Davis windshield.

6.0 RESULTS

The results have been plotted on Time History Graphs 18191/TH1 to 18191/TH2 enclosed, presenting the 15 minute A-weighted (dBA) L_{10}, L_{90}, L_{eq} and L_{max} levels at the measurement position throughout the duration of the survey.

The lowest $L_{A90\ (15min)}$ measurements are detailed in the table below.

Position	Lowest Measured $L_{A90(15min)}$ dB	
	Daytime (07:00 – 23:00 hours)	Night-Time (23:00 – 07:00 hours)
1	55	51

7.0 DISCUSSION OF NOISE CLIMATE

Due to the nature of the survey, i.e. unmanned, it is not possible to accurately describe the dominant noise sources, or specific noise events throughout the entire survey period. However at the beginning and end of the survey period the dominant noise source was noted to be road traffic noise from the surrounding roads.

8.0 PLANT NOISE EMISSION CRITERIA

We understand that the London Borough of Camden requires the following:

> *"Noise levels at a point 1 metre external to sensitive facades shall be at least 5dB(A) less than the existing background measurement (LA90), expressed in dB(A) when all plant/equipment are in operation. Where it is anticipated that any plant/equipment will have a noise that has a distinguishable, discrete continuous note (whine, hiss, screech, hum) and/or if there are distinct impulses (bangs, clicks, clatters, thumps) special attention should be given to reducing the noise levels from that piece of plant/equipment at any sensitive façade to at least 10dB(A) below the LA90, expressed in dB(A)."*

Based on the above criteria, and the results of the environmental noise survey we therefore propose the following future plant noise emission criteria should be achieved (with all relevant plant operating simultaneously) at 1m from the nearest noise sensitive facades based on the minimum measured L_{90} noise level.

Position	Noise Emission Limit (dBA)			
	Daytime (07:00 – 23:00 hours)		Night-Time (23:00 – 07:00 hours)	
	Non-tonal and non-impulsive	Tonal and/or impulsive	Non-tonal and non-impulsive	Tonal and/or impulsive
1	50	45	46	41

9.0 PLANT NOISE ASSESSMENT

The following items of plant are proposed for installation at Facebook, 42 Earlham Street, London.

Plant Description	Location	Qty	Plant Make	Model Number
Kitchen Extract Fan	First floor rear overlooking Shelton Street	1	Jetflow	SF315B

9.1 Plant Noise Emissions

We understand the manufacturer's noise data for the equipment to be as follows:

Plant Description	Sound Pressure Level (dB re $2x10^{-5}$ Pa) at 3 metre at Octave Band Centre Frequency (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
Jetflow SF315B	56	59	56	53	52	46	39	26	56

* Manufacturers noise level fitted to typical spectrum

For our calculations we have assumed the manufacturer's data has been measured at 3m from the grille.

9.2 Location of Plant

The kitchen extract fan is proposed to be ducted out the rear of the property overlooking Shelton Street at first floor level. We believe the nearest noise sensitive windows to be in the commercial property across Shelton Street approximately 11m away.

9.3 Plant Noise Impact Assessment

The following table presents our calculations relating to the proposed plant installation.

	Sound Pressure Level (dB re $2x10^{-5}$ Pa) at Octave Band Centre Frequency (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
Jetflow SF315B at 3m*	56	59	56	53	52	46	39	26	56
Distance Loss (8m)	-11	-11	-11	-11	-11	-11	-11	-11	-11
Calculated Noise Level at Window	45	48	45	42	41	35	28	15	45

* Manufacturers noise level fitted to typical spectrum

We understand that the proposed unit could be operational during daytime and night-time hours. Our calculations indicate that the proposed plant should be capable of achieving the requirements of the Local Authority outlined in Section 8.0 provided it is considered non-tonal. We cannot make an assessment of the tonality of the fan based on the single figure manufacturers data provided.

10.0 CONCLUSIONS

A detailed 24 hour daytime and night-time fully automated environmental noise survey has been undertaken in order to establish the currently prevailing first floor level environmental noise climate around the site.

Plant noise emission criteria have been recommended based on the results of the noise survey and in conjunction with the Local Authority.

An assessment has been carried out to determine the plant noise emissions at the nearest noise sensitive window.

The assessment indicates that the proposed plant should be capable of achieving the requirements of the Local Authority at the nearest noise sensitive window providing it is considered non-tonal.

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Appendix A

The acoustic terms used in this report are as follows:

dB : Decibel - Used as a measurement of sound pressure level. It is the logarithmic ratio of the noise being assessed to a standard reference level.

dBA : The human ear is more susceptible to mid-frequency noise than the high and low frequencies. To take account of this when measuring noise, the 'A' weighting scale is used so that the measured noise corresponds roughly to the overall level of noise that is discerned by the average human. It is also possible to calculate the 'A' weighted noise level by applying certain corrections to an un-weighted spectrum. The measured or calculated 'A' weighted noise level is known as the dBA level.

Because of being a logarithmic scale noise levels in dBA do not have a linear relationship to each other. For similar noises, a change in noise level of 10dBA represents a doubling or halving of subjective loudness. A change of 3dBA is just perceptible.

L_{10} & L_{90}: If a non-steady noise is to be described it is necessary to know both its level and the degree of fluctuation. The Ln indices are used for this purpose, and 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 the 'average maximum level'. Similarly, L_{90} is the average minimum level and is often used to describe the background noise.

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

L_{eq} : The concept of L_{eq} (equivalent continuous sound level) has up to recently been primarily used in assessing noise in industry but seems now to be finding use in defining many other types of noise, such as aircraft noise, environmental noise and construction noise.

L_{eq} is defined as 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. 1 hour).

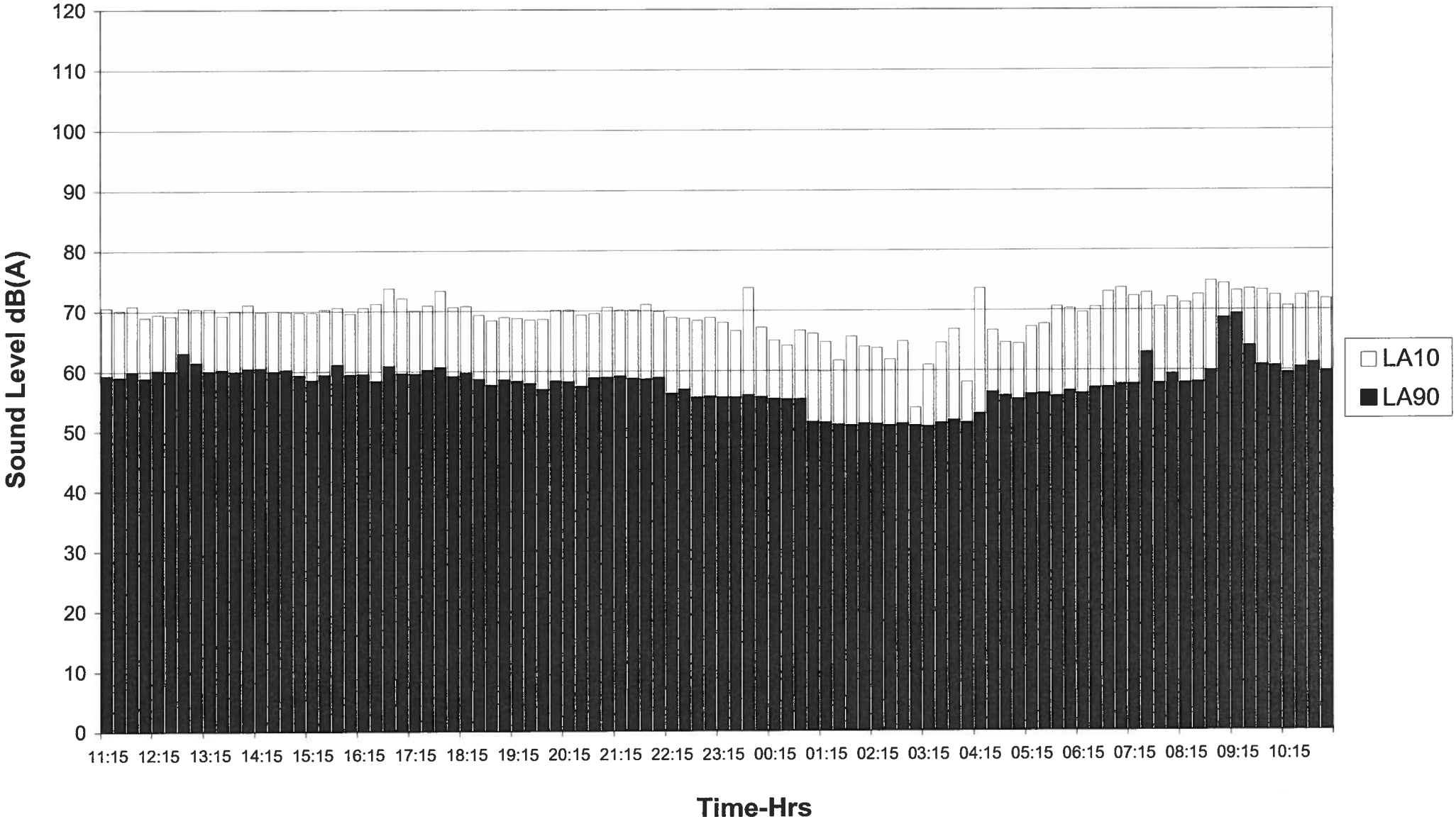
The use of digital technology in sound level meters now makes the measurement of L_{eq} very straightforward.

L_{max} : L_{max} is the maximum sound pressure level recorded over the period stated. L_{max} is sometimes used in assessing environmental noise where occasional loud noises occur, which may have little effect on the L_{eq} noise level.

Facebook, 42 Earlham Street, London

L_{A10} and L_{A90} Noise Levels

Tuesday 10/04/2012 - Wednesday 11/04/2012

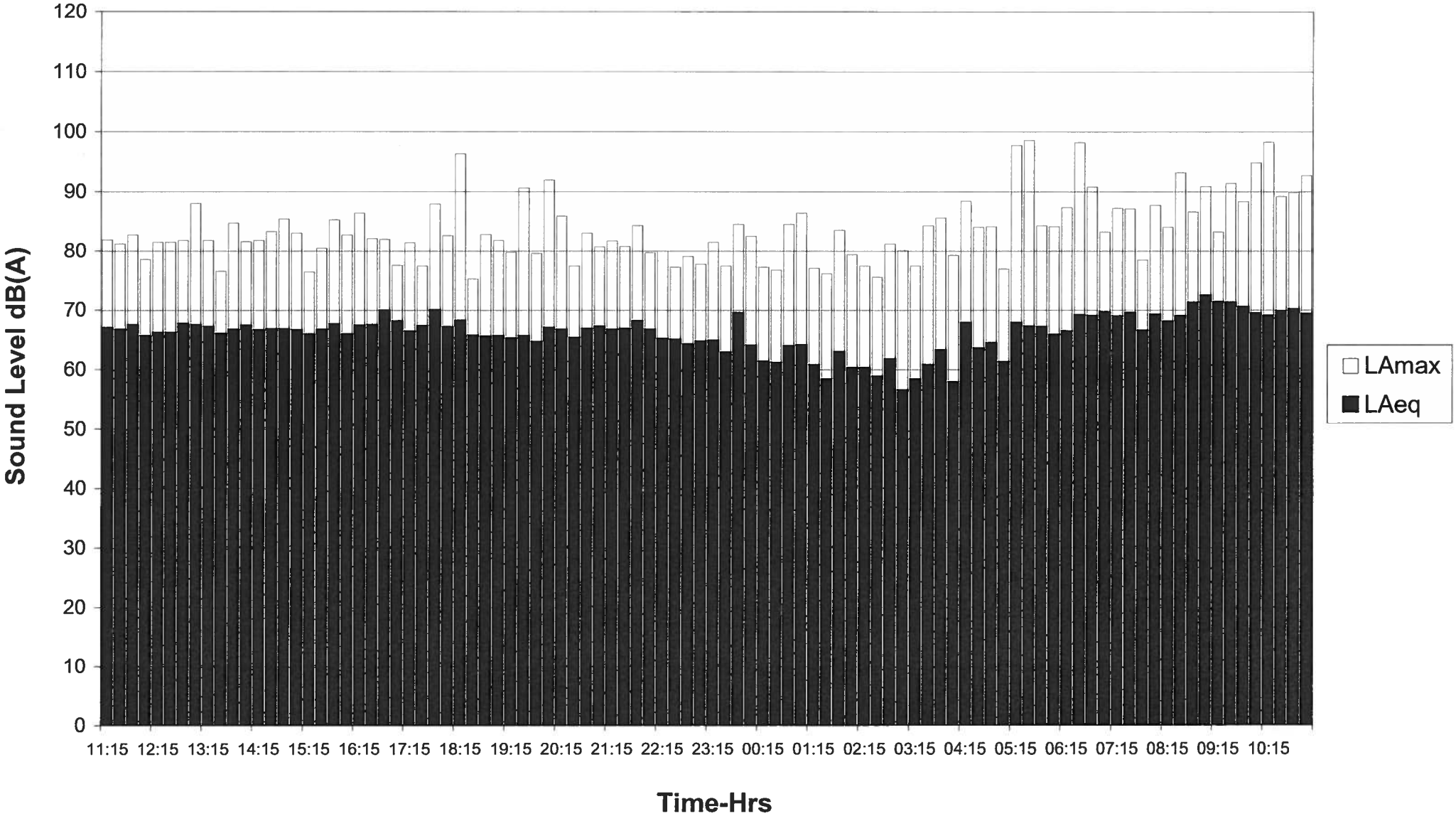


Time History Graph 18191/TH1

Facebook, 42 Earlham Street, London

L_{Aeq} and L_{Amax} Noise Levels

Tuesday 10/04/2012 - Wednesday 11/04/2012



Time History Graph 18191/TH2