Sainsbury's
19-21 Great Queen Street
London WC2B

ENVIRONMENTAL NOISE SURVEY
REPORT 18218/ENS(RevC)

For :

Riley Consulting Project Management Ltd
The Lansdowne Building
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1.0 INTRODUCTION

Ground floor space at 18-21 Great Queen Street, London is proposed to be occupied by Sainsbury's Local.

New items of building services will need to be installed. Hann Tucker Associates have therefore been commissioned to undertake an environmental noise survey at the site and specify the plant noise emission criteria.

This report presents the survey methodology and findings. The survey data may be 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 position at the site.

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.

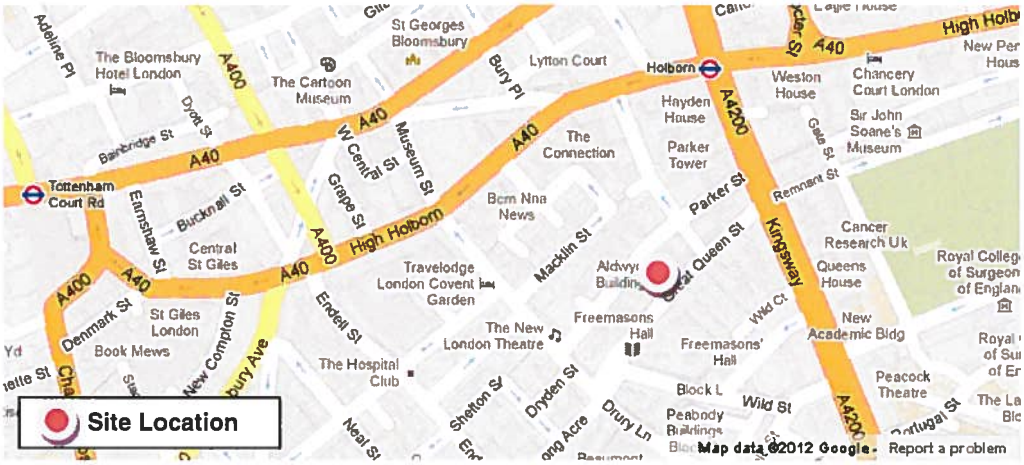
To assess the proposed plant and comment on its acceptability.

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

3.0 SITE DESCRIPTION

3.1 Location

The site is located at 19-21 Great Queen Street, London and falls within Camden's jurisdiction. See Location Map below.



Location Map (maps.google.co.uk)

3.2 Description

19-21 Great Queen Street comprises a 5No. storey commercial building. The site is bound by Great Queen Street to the South with residential and commercial properties adjoining in all other directions. 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 13:15 hours on Tuesday 24 April 2012 to 13:15 hours on Wednesday 25 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. The sky was generally patchy with cloud. We understand that generally throughout the survey period the weather conditions were mixed with some rainfall during the morning of 24 April 2012. These conditions 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 development site.

The microphone was positioned on the flat roof area in the light-well to the rear of the site.

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 Position (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	3542	LD calibration on 24/02/2012
Type 1 ½" Condenser Microphone	PCB	377B02	104675	LD calibration on 24/02/2012
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 18218/TH1 to 18218/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 $L_{Aeq\ (16hrs)}$ and $L_{Aeq\ (8hrs)}$ measurements are recorded in the table below:

Measured L_{AeqT} (dB re $2x10^{-5}$ Pa)	
Daytime (07:00 – 23:00 hours)	**Night-Time (23:00 – 07:00 hours)**
54	51

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

Lowest Measured $L_{A90\ (15min)}$ (dB re $2x10^{-5}$ Pa)	
Store Opening Hours (06:00 – 00:00 hours)	**24 hours**
50	50

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 sources were noted to be local road traffic and existing building services plant serving neighbouring properties.

8.0 PLANT NOISE EMISSION CRITERIA

We understand that the requirements of Camden Council are as follows:

> *"Noise levels at a point 1 metre external to sensitive facades shall be at least 5dBA less than the existing background measurement (L_{A90}), expressed in dBA 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 10dBA below the L_{A90}, expressed in dBA."*

As the proposed plant has been judged to contain no tonal element and on the basis of the above and the survey results we thus propose the following plant noise emission limits to be achieved at 1m from the façades of the nearest neighbouring buildings:

Plant Noise Emission Criteria (dB re $2x10^{-5}$ Pa)	
Store Opening Hours (06:00 – 00:00 hours)	**24 hours**
45	45

It should be noted that the above plant noise emission limits are subject to approval from Camden Council.

9.0 PLANT NOISE ASSESSMENT

9.1 Store Opening Hours (06:00 – 00:00 hours)

Air conditioning plant will be required to run between the hours of 06:00 and 00:00 only.

The following plant is to be installed on the flat roof to the rear of the site.

Plant Type	Sound Pressure Level (dB re 2 x 10^{-5} Pa) at 1m
1No. Enclosed Mitsubishi MUZ-GA25VA	22dBA
2No. Enclosed Mitsubishi PUHZ-RP125VKA	29dBA

The nearest noise sensitive windows are deemed to be approximately 1 metre from the proposed plant location. Our calculations are presented below:

Plant Type	Sound Pressure Level (dB re 2 x 10^{-5} Pa)
1No. Enclosed Mitsubishi MUZ-GA25VA at 1m	22dBA
2No. Enclosed Mitsubishi PUHZ-RP125VKA at 1m	29dBA
Combined SPL at 1 metre	30dBA
Distance Correction	+3dBA
Calculated Noise Level at Noise Sensitive Window	33dBA

Based on the data above for the enclosed plant, our calculations demonstrate that the requirements of the Local Authority should be achieved at the nearest noise sensitive window.

9.2 24 Hour Plant

Refrigeration plant will be required to run 24 hours a day.

The following plant is to be installed on the flat roof to the rear of the site.

Plant Type	Sound Pressure Level (dB re 2 x 10^{-5} Pa) at 10m	
	Daytime	Night-Time
RivaCold Condenser	20dBA	10dBA

The nearest noise sensitive windows are deemed to be approximately 1 metre from the proposed plant location. Our calculations are presented below:

Plant Type	Sound Pressure Level (dB re 2 x 10^{-5} Pa)	
	Daytime	Night-Time
RivaCold Condenser at 10m	20dBA	10dBA
Distance Correction	+23	+23
Calculated Noise Level at Noise Sensitive Window	43dBA	33dBA

Based on the data above for the enclosed plant, our calculations demonstrate that the requirements of the Local Authority should be achieved at the nearest noise sensitive window.

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 roof 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.

Our calculations demonstrate that the proposed plant should comply with he requirements of the Local Authority.

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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.

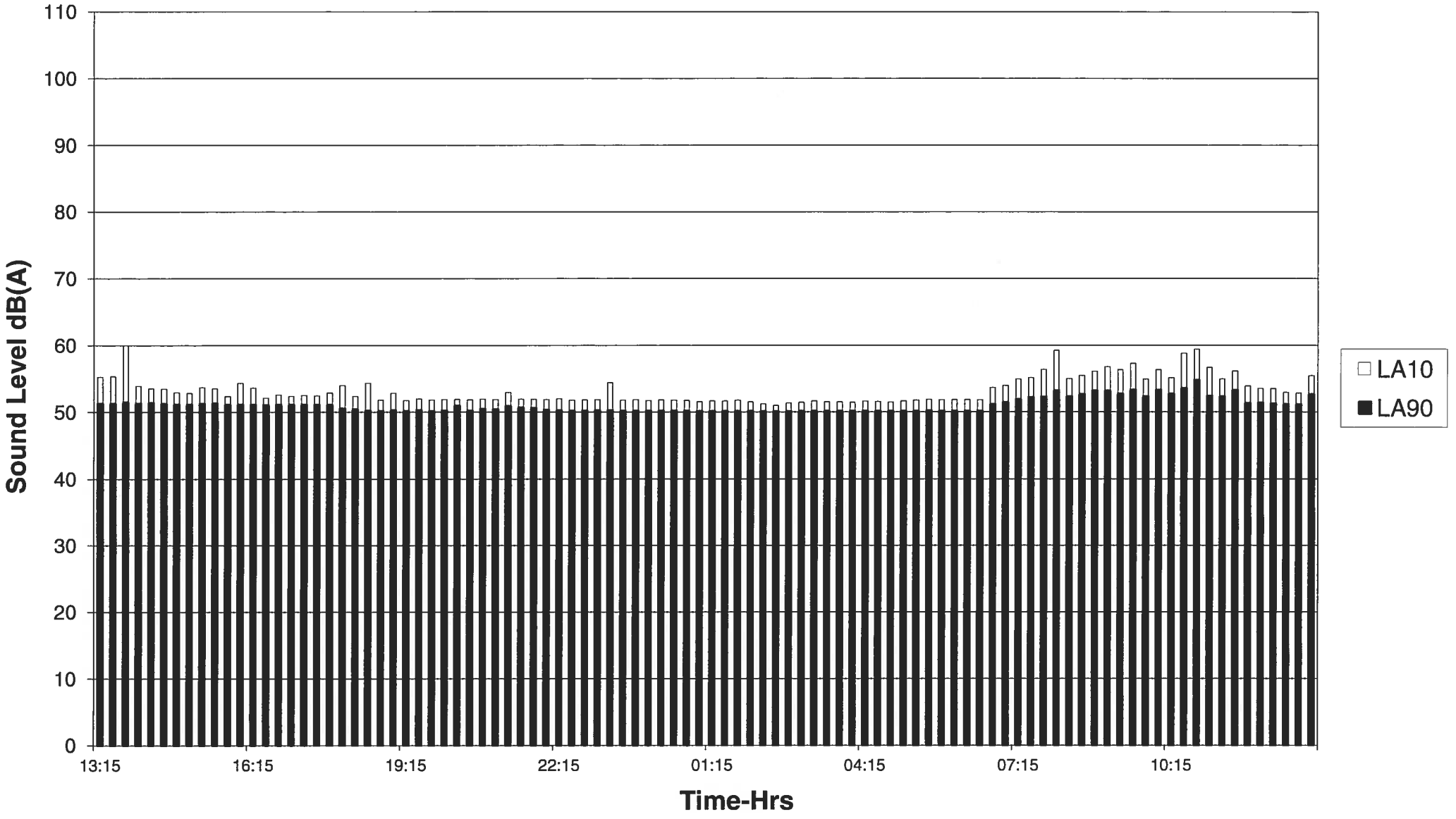
L_{eq} : The concept of L_{eq} (equivalent continuous sound level) has up to recently been primarily used in assessing noise in industry but seems now to be finding use in defining many other types of noise, such as aircraft noise, environmental noise and construction noise.

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.

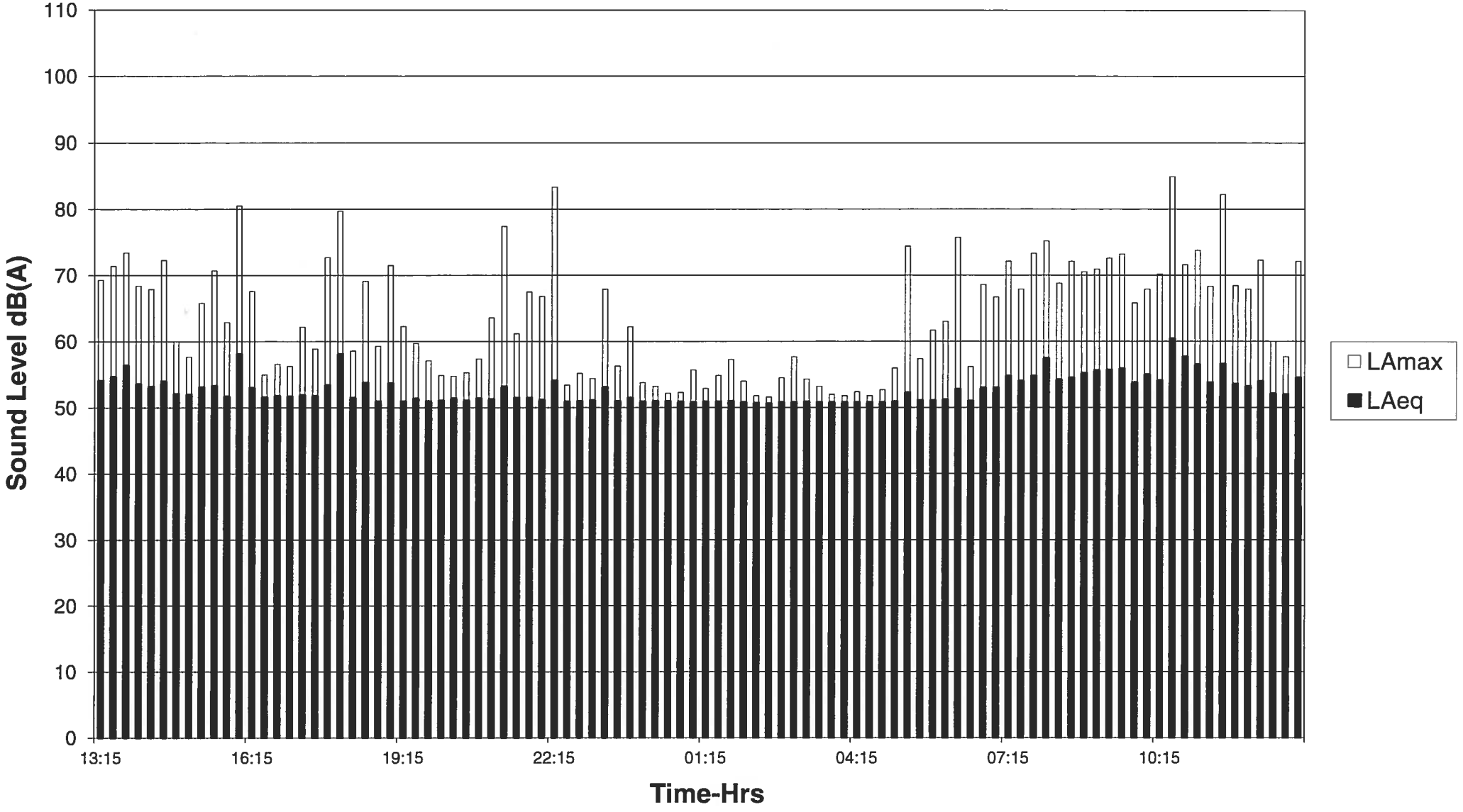
L_{max} : L_{max} is the maximum sound pressure level recorded over the period stated. L_{max} is sometimes used in assessing environmental noise where occasional loud noises occur, which may have little effect on the L_{eq} noise level.

19-21 Great Queen Street
Position 1
L_{A10} and L_{A90} Noise Levels
Tuesday 24/04/2012 - Wednesday 25/04/2012



Time History Graph 18218/TH1

19-21 Great Queen Street
Position 1
L_{Aeq} and L_{Amax} Noise Levels
Tuesday 24/04/2012 - Wednesday 25/04/2012



Time History Graph 18218/TH2