Belsize Garages
London

ENVIRONMENTAL NOISE SURVEY
REPORT 18928/ENS1

For :
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1.0 INTRODUCTION

A new residential development is proposed on Belsize Lane in North West London. The proposed building will contain 8 apartments with associated basement parking.

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 design/assessment purposes.

2.0 OBJECTIVES

To establish, by means of detailed 2 hour night time fully manned environmental noise monitoring, the existing A-weighted (dBA) L_{10}, L_{90}, L_{eq} and L_{max} environmental noise levels at selected accessible street level position at the site.

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

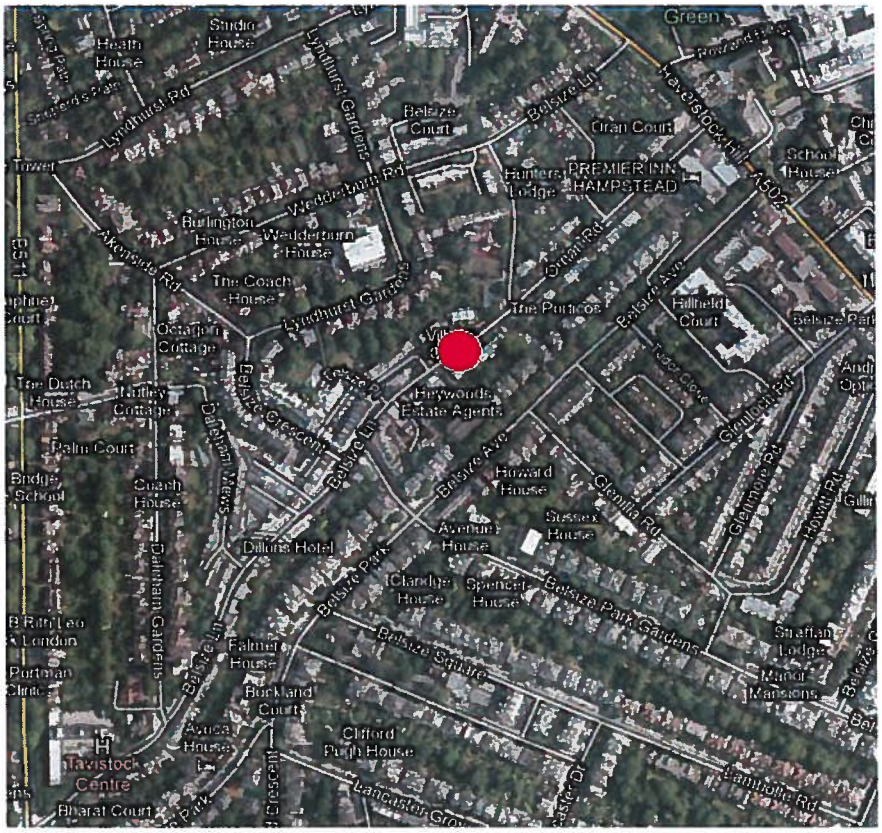
Based on the results of the noise survey, and in conjunction with the Local Authority, to recommend suitable plant noise emission criteria.

These objectives are as set out in Part 1.0 of our letter dated 30 January 2013.

3.0 SITE DESCRIPTION

3.1 Location

The site is located at Village Close Garages, Belsize Lane and falls within Camden Council's jurisdiction. See Location Map below.



Location Map (maps.google.co.uk)

3.2 Description

The site is bounded by Belsize Lane to the North, a garden area to the South and residential properties to the East and West of the site. See Site Plan below.


Site Plan (bing.com/maps)

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 manned environmental noise monitoring was undertaken from approximately 02:20 hours to 04:20 hours on Monday 18 February 2013.

During the survey period the wind conditions were calm. The sky was generally overcast. There was no rain during the survey. Road surfaces were dry throughout the survey period. These conditions are considered suitable for obtaining representative measurement results.

Measurements were taken of the A-weighted (dBA) L_{10}, L_{90}, L_{eq} and L_{max} sound pressure levels over a period of 2 hours. Atypical noises were excluded as far as reasonably possible. The noise levels measured are therefore assumed to be representative of the noise climate during the hour in which the measurements were taken

In addition, at each position typical L_{90}, L_{eq} and L_{max} octave band spectra (from 63Hz to 8kHz) were taken in order to gain a more detailed description of the prevailing noise climate.

5.2 Measurement Position

The noise level measurements were undertaken at 1 position at the development site. The microphone was positioned approximately 1.5 meters above ground level and approximately 15 meters from the road side.

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 Manned Measurement Position (bing.com/maps)

5.3 Instrumentation

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

Description	Manufacturer	Type	Serial Number	Latest Verification
Type 1 Precision Sound Level Meter	Brüel and Kjær	2260	3444	B & K calibration on 09/05/2011
Type 1 Calibrator	Brüel and Kjær	4231	3082	B & K calibration on 02/03/2012
Pistonphone	Brüel and Kjær	4220	1297463	B & K calibration on 02/08/2005

The sound level meter was connected to an extension cable and was fitted with a Brüel and Kjær microphone windshield.

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

6.0 RESULTS

The results have been plotted on Time History Graphs 18928/TH1 to 18928/TH2 enclosed presenting the 5 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 measured L_{eq} and L_{90} octave band spectra levels are shown in the table below:

Measured Octave Band Spectra (dB re 20 x 10^{-5} Pa)									
	31.5	63	125	250	500	1k	2k	4k	8k
L_{Aeq}	24	25	27	27	28	28	29	29	30
L_{A90}	19	21	24	24	26	27	27	28	29

7.0 DISCUSSION OF NOISE CLIMATE

The dominant noise sources at the measurement position were distant air traffic noise and road traffic noise from an occasional passing car.

The survey was undertaken at what is considered to be the quietest period of the 24 hour day. The subjective interpretation of the noise climate during the measurement period was that it was quiet and there were no unusual or exceptional noise sources present.

8.0 PLANT NOISE EMISSION CRITERIA

Camden Council have recommended the following criteria relating to plant noise emissions for normal operations:

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

Based on the above criteria and the lowest background, L_{A90}, noise levels recorded during our environmental noise survey, we propose the following plant noise emission limits to be achieved at one metre from the window of the nearest noise sensitive premises.

Lowest Measured L_{A90} (dBA)	Plant Noise Emission Limit (dBA)
40	**35**

9.0 CONCLUSIONS

A detailed 2 hour night time fully manned environmental noise survey has been undertaken in order to establish the currently prevailing street level environmental noise climate at the site.

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

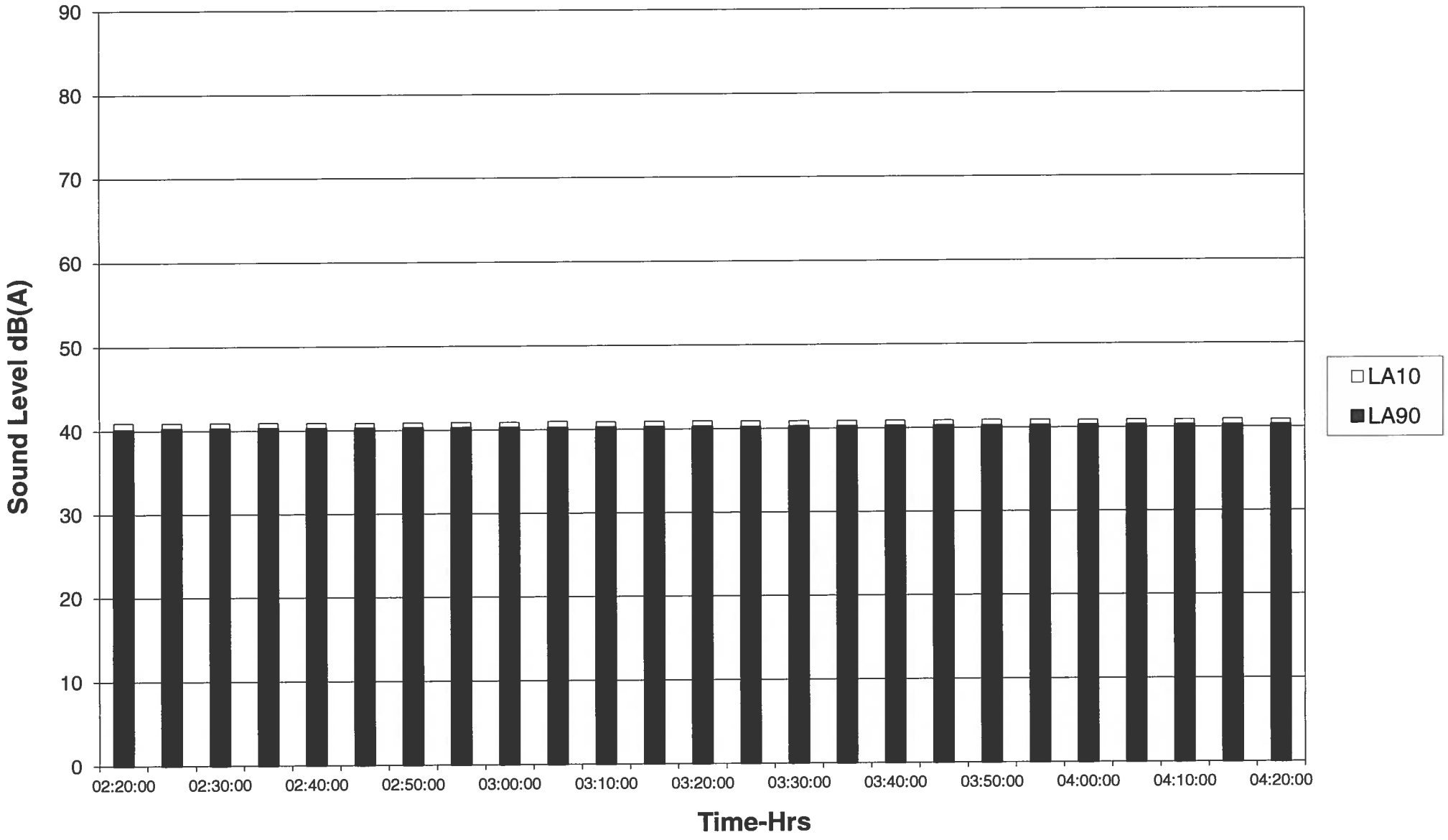
The use of digital technology in sound level meters now makes the measurement of L_{eq} very straightforward.

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.

Belsize Garages

L_{A10} and L_{A90} Noise Levels

Monday 18/02/2013



Time History Graph 18928/TH1

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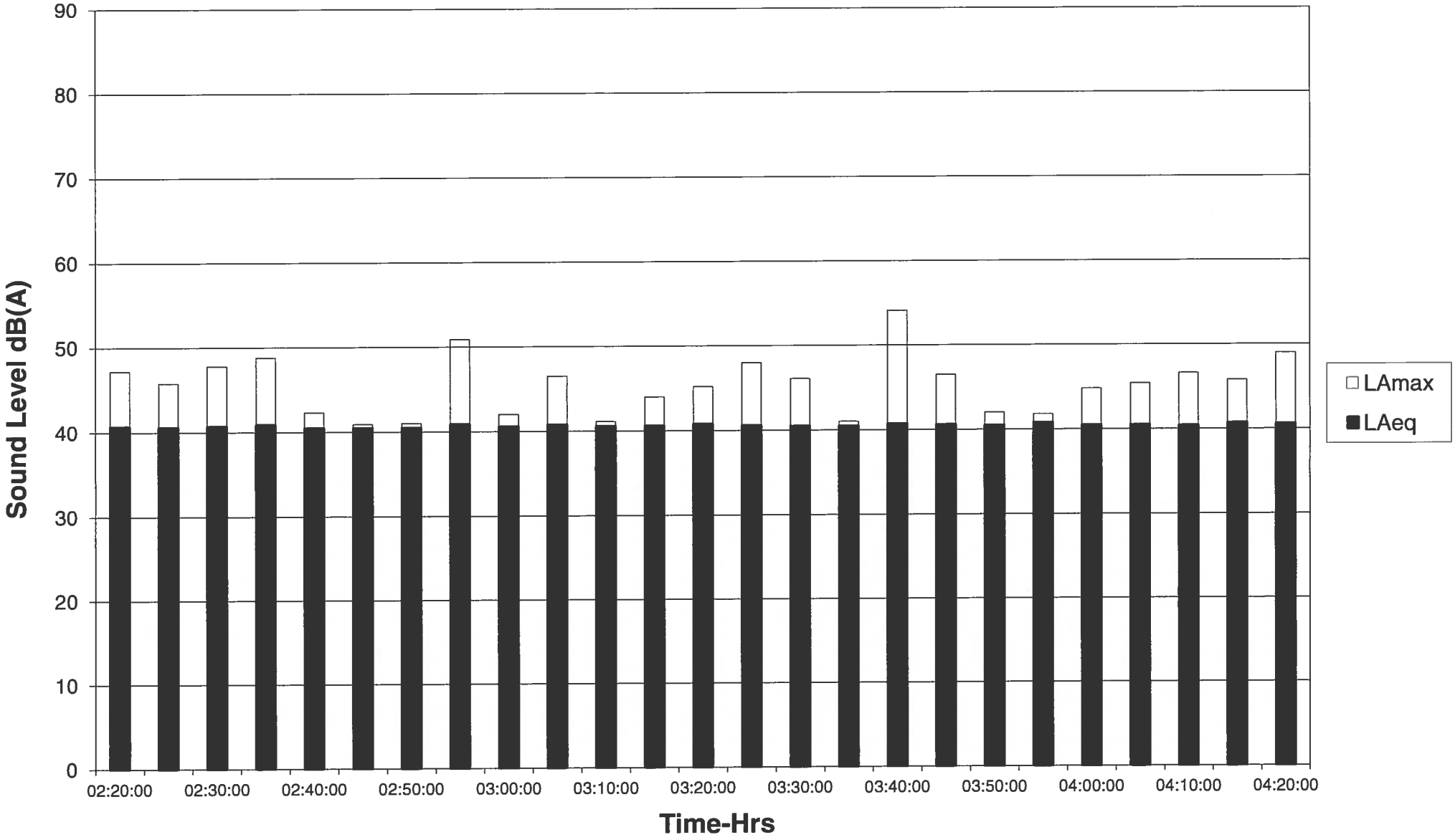
L_{Aeq} and L_{Amax} Noise Levels

Monday 18/02/2013



Time History Graph 18928/TH2