# 99 Heath Street

ENVIRONMENTAL NOISE SURVEY
& PLANT NOISE ASSESSMENT
REPORT 16062/PNA3

For:

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# 1.0 INTRODUCTION

It has been proposed to install 2No. items of building service plant in a plantroom at 99 Heath Street, located to the rear of the site.

Hann Tucker Associates have therefore been commissioned to undertake a detailed environmental noise survey of the site. The results of the noise survey will be subsequently used to propose plant noise emission levels in line with the Local Authority's requirements and assess the plant items with respect to these criteria.

This report presents the survey methodology and findings.

# 2.0 OBJECTIVES

To establish, by means of detailed 72 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 positions.

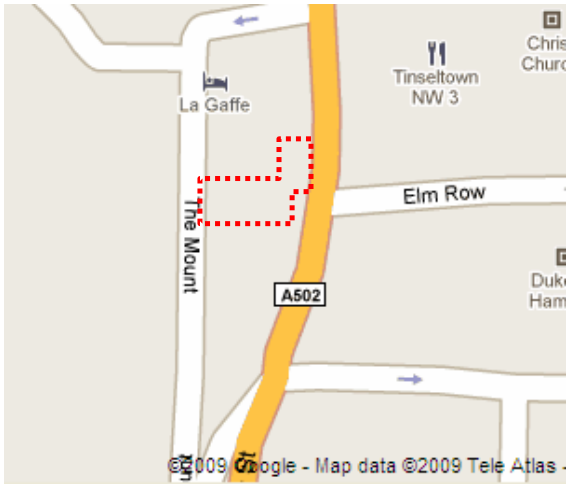
Based on the results of the noise survey, and in conjunction with the Local Authority, to recommend suitable plant noise emission criteria.

To assess the items of plant with respect to the Local Authority's requirements, making any recommendations for mitigation measures where necessary.

# 3.0 SITE DESCRIPTION

## 3.1 Location

The site is located at 99 Heath Street and falls within London Borough of Camden's jurisdiction. See Location Map below.




Location Map (maps.google.co.uk)

### 3.2 Description

The site, located at 99 Heath Street overlooks Heath Street to the East. Adjacent to the North and South are commercial properties. West of the site are residential properties. 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 12:30 hours on Friday 20 November 2009 to 12:30 hours on Monday 23 November 2009.

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 moderate from approximately a South Westerly direction. The sky was generally patchy cloud. We understand that generally throughout the survey period there were some isolated showers. 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 a single position at the development site. The sound level meter was located at the rear of the site. The microphone was attached to a pole approximately 2m above ground level and approximately 1m away from any reflective 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 | 3444 | LD calibration on 09/10/2008 |
| Type 1 ½" Condenser Microphone | PCB | 377B02 | 109063 | LD calibration on 09/10/2008 |
| Type 1 Calibrator | Larson Davis | CAL200 | 3082 | LD calibration on 02/11/2009 |

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.

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 16062/TH1.1 to 16062/TH1.2 enclosed presenting the 15 minute A-weighted (dBA) $L_{10}$, $L_{90}$, $L_{eq}$ and $L_{max}$ levels at each measurement position throughout the duration of the survey.

The following table presents the lowest measure $L_{A90(15min)}$ from the survey period, including corrections for the facade effect.

| **Lowest Measured $L_{A90(15min)}$ dB** | | |
|---|---|---|
| **Daytime (07:00-23:00 hours)** | **Night Time (23:00 –07:00 hours)** | **24 Hrs** |
| 40 dB | 38 dB | 38 dB |

## 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 from surrounding roads.

Existing plant was not in operation during the survey.

## 8.0 PLANT NOISE EMISSION CRITERIA

We understand that the requirements of London Borough of Camden for both office and residential properties are as follows:

> *"Noise levels at a point 1 metre external to sensitive facades shall be at least 5dB(A) less than the 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 $L_{A90}$ expresses in dB(A)".*

Based on London Borough of Camden criteria, and the results of the environmental noise survey, we propose the following future plant noise emission criteria to be achieved at 1 metre from the nearest noise sensitive facades:

| **Plant Noise Emission Criteria (dB re $2x10^{-5}$ Pa) at Nearest Noise Sensitive Façade** | | |
|---|---|---|
| **Daytime (07:00-23:00 hours)** | **Night Time (23:00 –07:00 hours)** | **24 Hrs** |
| 35 dB | 33 dB | 33 dB |

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

# 9.0 PLANT NOISE ASSESSMENT

We understand that the following items of plant are installed in the rear courtyard at 99 Heath Street.

| Plant Description | Location | Qty | Plant Make | Model Number |
|---|---|---|---|---|
| Condenser 1 | Roof | 1 | Mitsubishi Electric | PUHY-P300 YGM-A |
| Condenser 2 | Roof | 1 | Mitsubishi Electric | MUZ-GB50VA |

## 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 1 metre at Octave Band Centre Frequency (Hz) | | | | | | | | dBA |
|---|---|---|---|---|---|---|---|---|---|
| | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k | |
| Condenser 1 | 65 | 61 | 58 | 55 | 52 | 51 | 51 | 46 | 59 |
| Condenser 2 | 60 | 63 | 56 | 54 | 49 | 43 | 40 | - | 55 |

## 9.2 Location of Plant

We understand the aforementioned items of building service plant are to be re-located to the plantroom situated to the rear of the site, adjacent to the unit's current location. It has been proposed to locate the Inlet louvre over the existing entrance door and exhaust louvre on the roof of the plantroom away from the inlet louvre.

## 9.3 Plant Noise Impact Assessment

We understand that both condensers will be operational during daytime hours Monday to Friday. Attenuators are to be installed at the inlet and exhaust louvres having the following minimum insertion losses at the octave band frequencies:

| | Minimum Insertion Loss (dB) at Octave Band Centre Frequency (Hz) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| Inlet | 12 | 19 | 18 | 20 | 21 | 23 | 25 | 22 |
| Exhaust | 13 | 22 | 20 | 22 | 22 | 25 | 27 | 24 |

Based on the internal noise levels of the plantroom from the units and the proposed attenuators, our calculations indicate that noise levels emitted from the inlet and exhaust louvres should satisfy the requirements of the Local Authority outlined in Section 8.0.

# 10.0 CONCLUSIONS

A detailed 72 hour daytime and night time fully automated environmental noise survey has been undertaken in order to establish the currently prevailing 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 façade.

The assessment indicates that the items of plant should be capable of achieving the requirements of the Local Authority at the nearest noise sensitive façade.

**Prepared by**
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**Senior Consultant**
**HANN TUCKER ASSOCIATES**

# 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.

dB(A) : 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 dB(A) level.

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

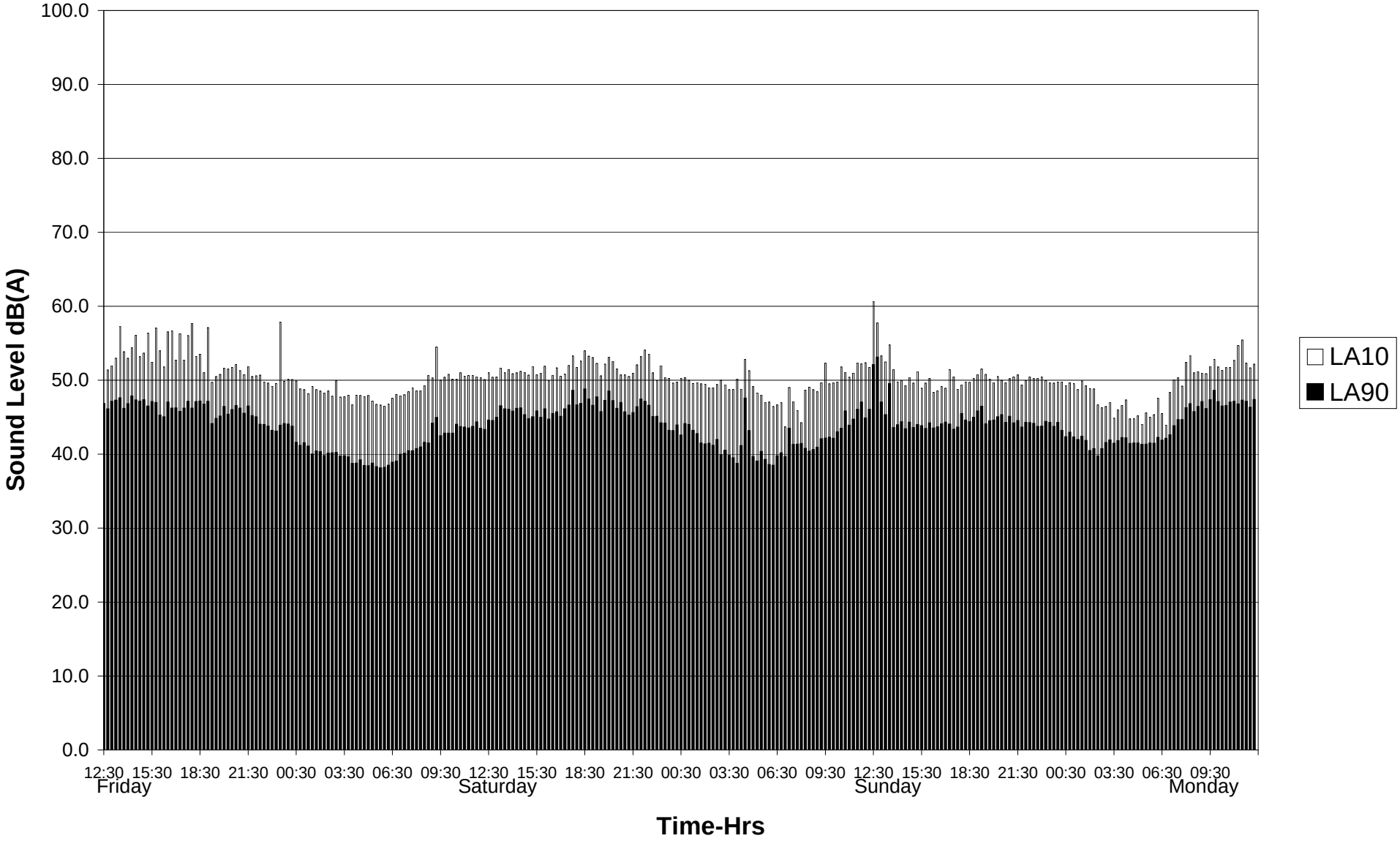
The use of digital technology in sound level meters now makes the measurement of $L_{eq}$ very straightforward.

$L_{max}$ : $L_{max}$ 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.

# 99 Heath Street

## $L_{A10}$ and $L_{A90}$ Noise Levels

## Friday 20 November 2009 to Monday 23 November 2009

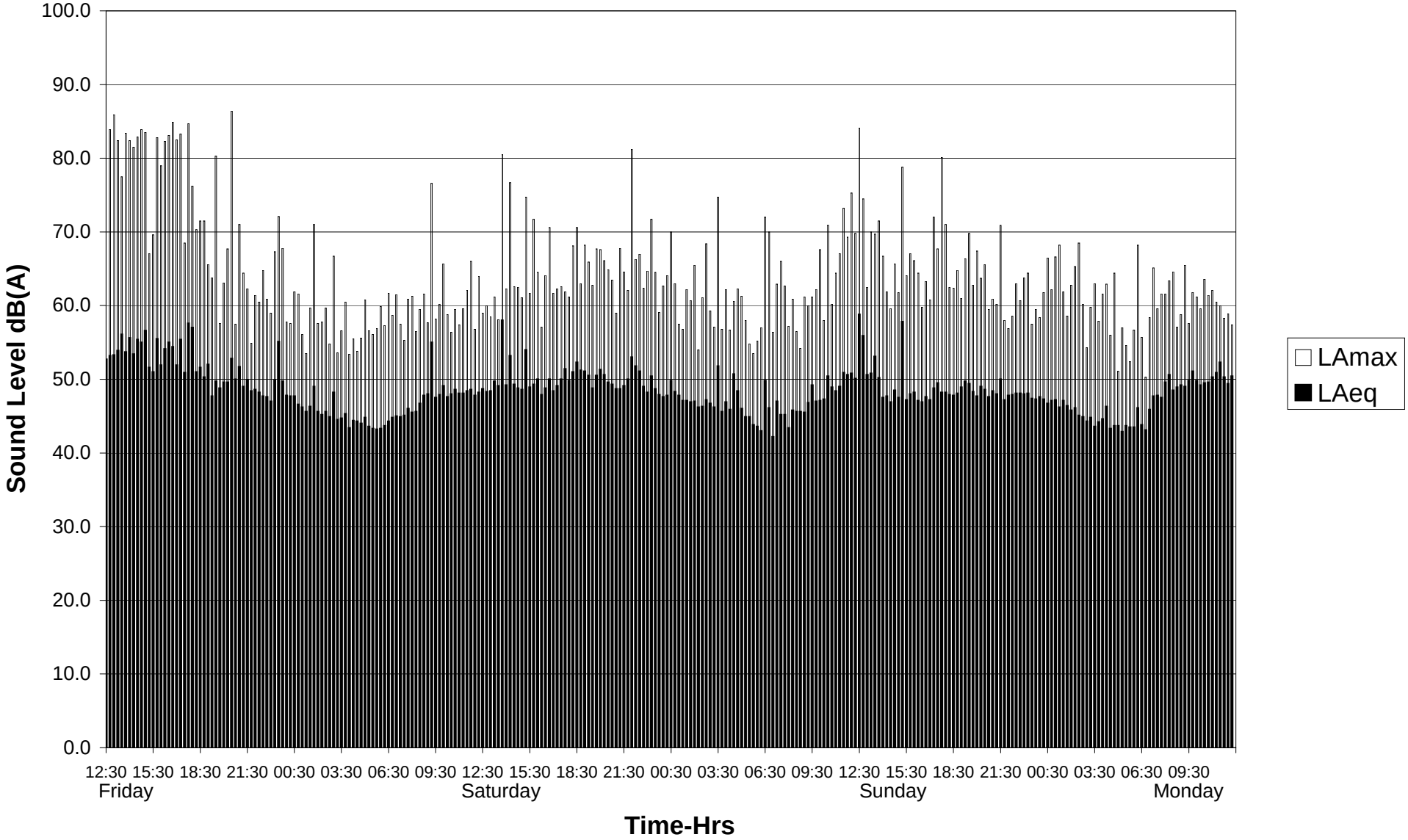



Time History Graph 16062/TH1.1

# 99 Heath Street

## $L_{Aeq}$ and $L_{Amax}$ Noise Levels

## Friday 20 November 2009 to Monday 23 November 2009




Time History Graph 16062/TH1.2