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# SELWYN PRIMARY SCHOOL,
## LONDON

## ENVIRONMENTAL NOISE SURVEY

Report **8991-ENS-03**

Prepared on 3 March 2014

Issued For:

**Mace Group**
**155 Moorgate**
**London**
**EC2M 6XB**

committed to CSCS Platinum award

ISO 17025

ISO 9001

Institute of Acoustics sponsoring organisation

## Contents



## List of Attachments

## 1.0 INTRODUCTION

Clement Acoustics Ltd has been commissioned by Mace Group to measure existing ambient noise levels affecting the proposed Selwyn Primary School development site at London E4 9NG.

This report presents the results of the environmental noise surveys undertaken in order to measure prevailing background levels and outlines any necessary mitigation measures.

## 2.0 ENVIRONMENTAL NOISE SURVEY

### 2.1 Procedure

Measurements were undertaken at the positions shown in Site Plan 8991-SP3. The choice of these positions was based both on accessibility and on collecting representative noise data in relation to the main noise sources in the area.

Continuous automated monitoring was undertaken for the duration of the survey between 16:30 on 24 February 2014 and 10:20 on 26 February 2014.

Background noise levels at the monitoring position were dominated by on site school activity and road traffic noise from surrounding roads.

Weather conditions were generally dry with light winds, therefore suitable for the measurement of environmental noise.

The measurement procedure generally complied with BS7445:1991. *Description and measurement of environmental noise, Part 2- Acquisition of data pertinent to land use*.

### 2.2 Equipment

The equipment calibration was verified before and after use and no abnormalities were observed.

The equipment used was as follows.

- 2 No. Svantek Type 971 Class 1 Sound Level Meters
- Norsonic Type 1251 Class 1 Calibrator

# 3.0 RESULTS

## 3.1 Environmental Noise Surveys

The $L_{Aeq:\ 5min}$, $L_{Amax:\ 5min}$, $L_{A10:\ 5min}$ and $L_{A90:\ 5min}$ acoustic parameters were measured at the locations shown in Site Plan 8991-SP3. The measured levels are shown as time histories in Figures 8991-TH3A-B.

Average ambient and minimum background noise levels are shown in Table 3.1.

| | Average ambient noise level $L_{Aeq:\ 5min}$ dB(A) | Minimum background noise level $L_{A90:\ 5min}$ dB(A) |
|---|---|---|
| LOCATION 1 [*CAVENDISH ROAD*] | | |
| Daytime (07:00 - 23:00) | 56 | 46 |
| Night-time (23:00 - 07:00) | 52 | 39 |
| Typical School Hours (08:00 - 17:00) | 58 | 48 |
| LOCATION 2 [*SELWYN AVENUE*] | | |
| Daytime (07:00 - 23:00) | 63 | 48 |
| Night-time (23:00 - 07:00) | 53 | 41 |
| Typical School Hours (08:00 - 17:00) | 62 | 49 |

**Table 3.1: Average ambient noise levels**

As ambient noise levels will be used to assess suitable glazing for noise sensitive rooms, the spectral levels are also important when considering the ambient noise profile. These have been calculated for the typical school hours, as shown in Table 3.2.

| | *Measured Ambient Noise Level (dB) in each Frequency Band* | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Location** | **63Hz** | **125Hz** | **250Hz** | **500Hz** | **1kHz** | **2kHz** | **4kHz** | **8kHz** | **dB(A)** |
| Location 1 | 60 | 53 | 52 | 53 | 55 | 51 | 45 | 42 | 58 |
| Location 2 | 67 | 61 | 55 | 57 | 58 | 56 | 49 | 44 | 62 |

**Table 3.2: Measured Spectral Ambient Noise Levels**

### 3.2 Manual Measurements

In addition to environmental noise surveys, 10 minute manual measurements were also undertaken in the position indicated on the site plans, in order to investigate noise propagation to other areas of the school site.

The measurements were undertaken concurrently with ongoing survey measurements, such that comparative levels can be calculated for the manual measurement position.

Manual measurement levels and comparative levels are shown in Table 3.3.

| | Average ambient noise level $L_{Aeq: 5min}$ dB(A) | Minimum background noise level $L_{A90: 5min}$ dB(A) |
|---|---|---|
| Measured Level at Survey Position 1 | 53 | 48 |
| Measured Level at Survey Position 2 | 58 | 49 |
| Measured Level at Manual Measurement Position | 50 | 46 |

**Table 3.3: Comparative levels at manual measurement positions**

## 4.0 DISCUSSION

### 4.1 Ambient Noise Levels

Noise measurements have been conducted with regard to ascertaining the existing ambient noise levels surrounding the site due to identified noise sources.

The measured levels would not lead to particularly onerous glazing specifications as the site is located at a significant distance from any major roads.

It is expected that a typical masonry wall construction in conjunction with double glazed windows would be sufficient to demonstrate an internal noise environment compliant with requirements of Building Bulletin 93 '*Acoustic design in schools*' as well as other relevant British Standards.

Once more is known of the proposed site, further calculations can be undertaken in order to more accurately calculate the required glazing configuration for noise sensitive school spaces based on the measured noise levels.

A full noise propagation map can also be generated in order to investigate how levels of ambient noise vary throughout the site and as such, will affect different areas of the proposed school development.

### 4.2 Background Noise Levels

Background noise levels shown in Table 3.1 can be used to assess proposed noisy activities such as playground use and music rooms in terms of their impact on nearby residences.

It should be noted that, with houses already close to playgrounds and yard areas, this could be taken into consideration when assessing the likely impact.

## 5.0 CONCLUSION

An environmental noise survey has been undertaken at the proposed Selwyn Primary School development site at London E4 9NG to measure existing ambient and background noise levels.

Measured noise levels have been reported in this document and have been found to be dominated by activity from existing school activities and road traffic noise from surrounding roads.

Existing ambient noise levels are such that typical building constructions are expected to be sufficient for the proposed school use.

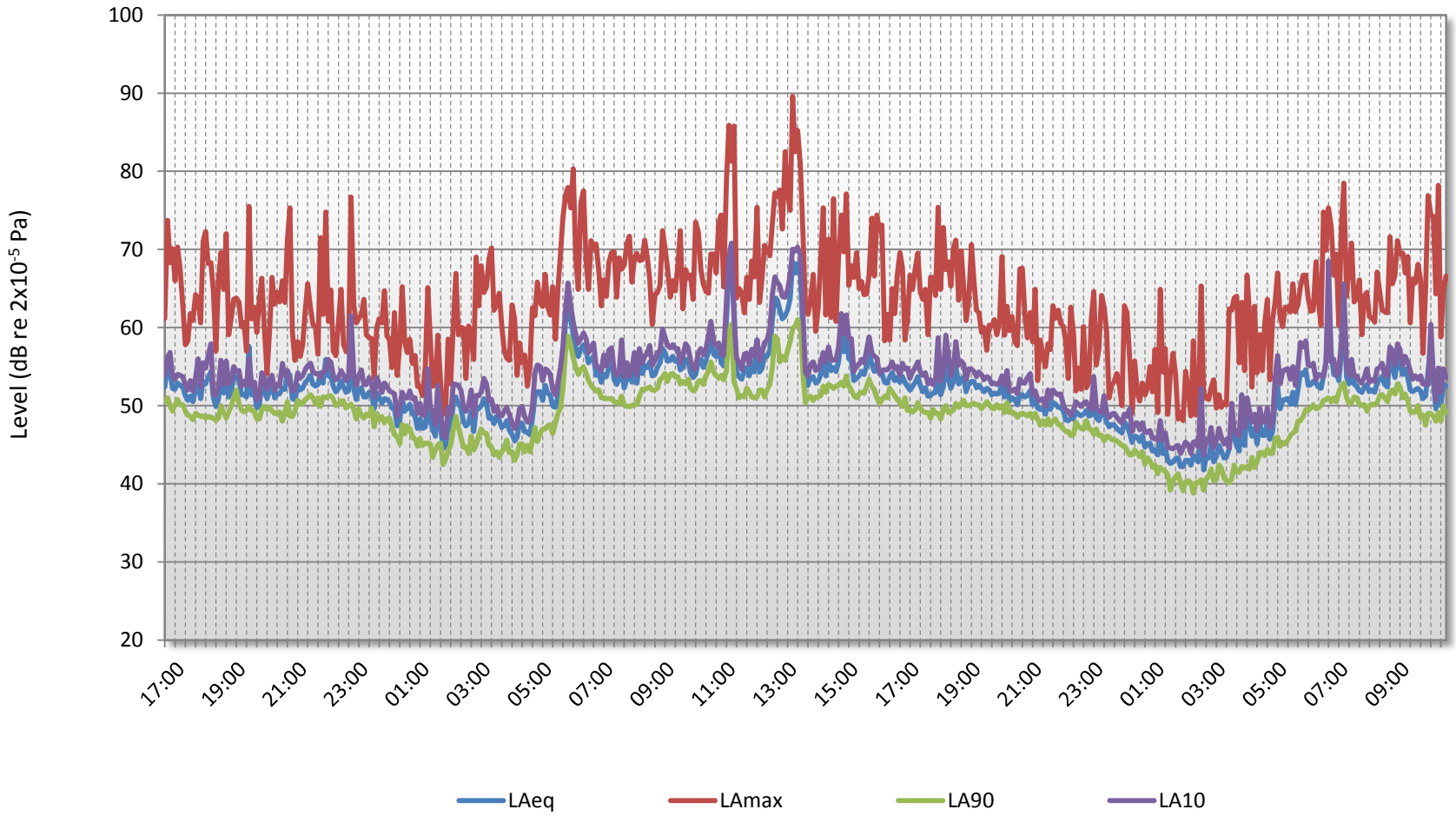
Once more is known of proposals, a full glazing assessment can be undertaken for the development, based on measured levels.

| Report by | Checked by |
| --- | --- |
| **Duncan Martin MIOA** | **Florian Clement MIOA** |


**8991-SP3** Indicative site plan showing noise monitoring positions and manual monitoring position **Date:** 04 March 2014

## SELWYN PRIMARY SCHOOL [*Cavendish Road*]

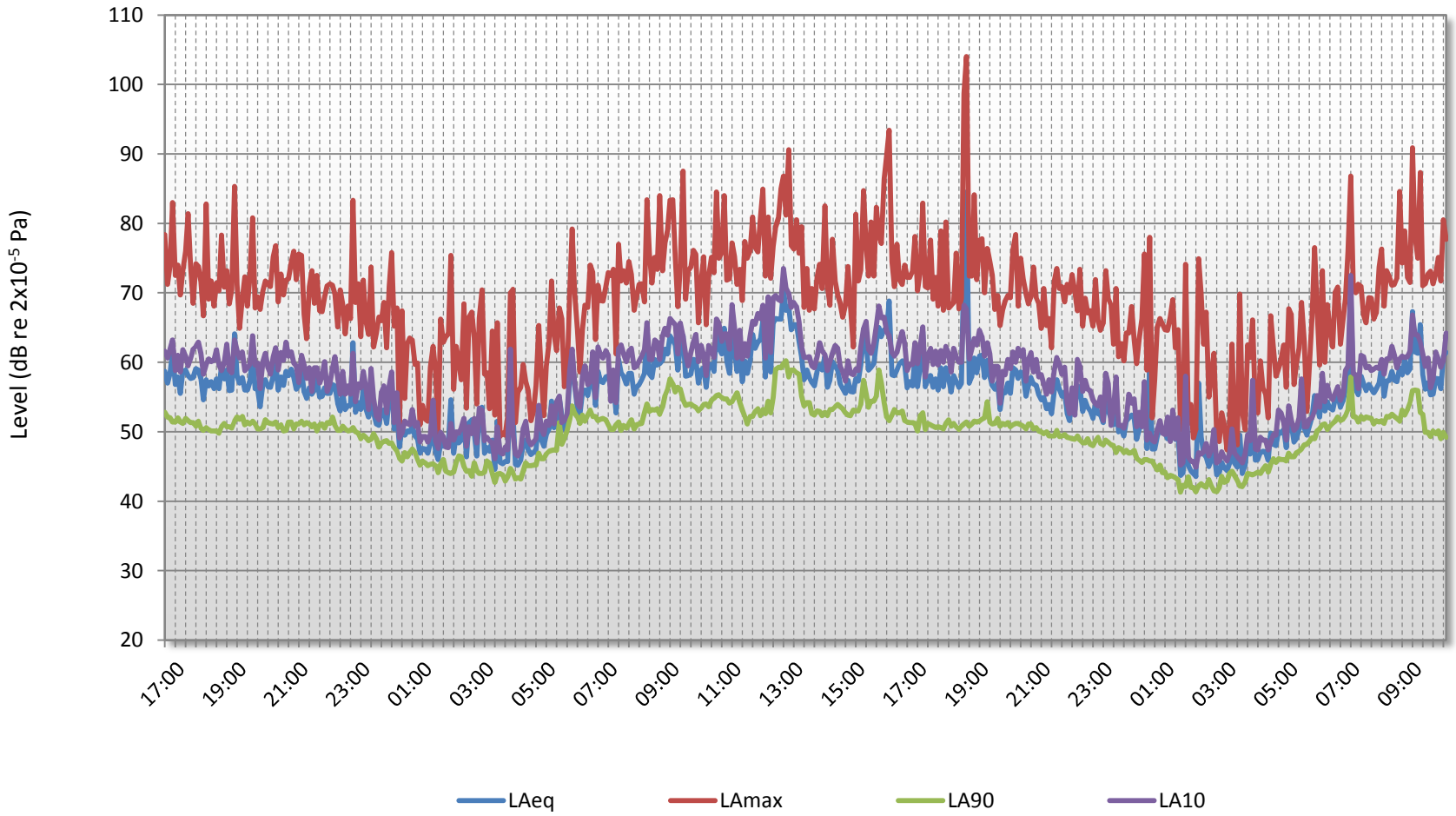
Environmental Noise Time History
24 February 2014 to 26 February 2014




8991-TH3A

## SELWYN PRIMARY SCHOOL [*Selwyn Avenue*]

Environmental Noise Time History
24 February 2014 to 26 February 2014




8991-TH3B

# APPENDIX A

## GLOSSARY OF ACOUSTIC TERMINOLOGY

### dB(A)

The human ear is less sensitive to low (below 125Hz) and high (above 16kHz) frequency sounds. A sound level meter duplicates the ear's variable sensitivity to sound of different frequencies. This is achieved by building a filter into the instrument with a similar frequency response to that of the ear. This is called an A-weighting filter. Measurements of sound made with this filter are called A-weighted sound level measurements and the unit is dB(A).

### $L_{eq}$

The sound from noise sources often fluctuates widely during a given period of time. An average value can be measured, the equivalent sound pressure level $L_{eq}$. The $L_{eq}$ is the equivalent sound level which would deliver the same sound energy as the actual fluctuating sound measured in the same time period.

### $L_{10}$

This is the level exceeded for not more than 10% of the time. This parameter is often used as a "not to exceed" criterion for noise

### $L_{90}$

This is the level exceeded for not more than 90% of the time. This parameter is often used as a descriptor of "background noise" for environmental impact studies.

### $L_{max}$

This is the maximum sound pressure level that has been measured over a period.

### Octave Bands

In order to completely determine the composition of a sound it is necessary to determine the sound level at each frequency individually. Usually, values are stated in octave bands. The audible frequency region is divided into 10 such octave bands whose centre frequencies are defined in accordance with international standards.

### Addition of noise from several sources

Noise from different sound sources combines to produce a sound level higher than that from any individual source. Two equally intense sound sources operating together produce a sound level which is 3dB higher than one alone and 10 sources produce a 10dB higher sound level.

### Attenuation by distance

Sound which propagates from a point source in free air attenuates by 6dB for each doubling of distance from the noise source. Sound energy from line sources (e.g. stream of cars) drops off by 3dB for each doubling of distance.

### Subjective impression of noise

Sound intensity is not perceived directly at the ear; rather it is transferred by the complex hearing mechanism to the brain where acoustic sensations can be interpreted as loudness. This makes hearing perception highly individualised. Sensitivity to noise also depends on frequency content, time of occurrence, duration of sound and psychological factors such as emotion and expectations. The following table is a reasonable guide to help explain increases or decreases in sound levels for many acoustic scenarios.

| Change in sound level (dB) | Change in perceived loudness |
|---|---|
| 1 | Imperceptible |
| 3 | Just barely perceptible |
| 6 | Clearly noticeable |
| 10 | About twice as loud |
| 20 | About 4 times as loud |

### Barriers

Outdoor barriers can be used to reduce environmental noises, such as traffic noise. The effectiveness of barriers is dependent on factors such as its distance from the noise source and the receiver, its height and its construction.

### Reverberation control

When sound falls on the surfaces of a room, part of its energy is absorbed and part is reflected back into the room. The amount of reflected sound defines the reverberation of a room, a characteristic that is critical for spaces of different uses as it can affect the quality of audio signals such as speech or music. Excess reverberation in a room can be controlled by the effective use of sound-absorbing treatment on the surfaces, such as fibrous ceiling boards, curtains and carpets.