HILSON MORAN
consulting engineers

Keneth Peters Asset Management Ltd

15-17 Jockey's Fields, London

Plant Noise Assessment Report

Issue	Date
1.0	21 December 2012

HILSON MORAN
ONE DISCOVERY PLACE
COLUMBUS DRIVE
SOUTHWOOD WEST
FARNBOROUGH
HAMPSHIRE GU14 0NZ

Keneth Peters Asset Management Ltd

15-17 Jockey's Fields, London

Plant Noise Assessment Report

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Originator:	Nicholas Jones Head of Acoustics
Approved:	Mark Brightwell Principal Acoustic Consultant
Copies to:	Keneth Peters Asset Management Ltd hmp104 – Acoustics

Contents

1 EXECUTIVE SUMMARY

A new condenser fan table is proposed to be installed at roof level at 15-17 Jockey's Fields, London. Hilson Moran has undertaken a noise survey to determine prevailing background noise levels at the nearest noise-sensitive properties.

The results of the survey and the requirements of Camden Council have been used to establish external plant noise limits for the new plant, when measured at the nearest noise sensitive property.

Calculations have been undertaken to predict noise emissions from the proposed plant. The predicted noise levels at the nearest noise sensitive properties are lower than the noise limits and as such the proposed plant is predicted to achieve the requirements of Camden Council.

2 INTRODUCTION

A new condenser fan table is proposed to be installed at roof level at 15-17 Jockey's Fields, London. Hilson Moran has undertaken a noise survey to determine prevailing background noise levels at the nearest noise-sensitive properties.

The purposes of this report are:

a) to determine prevailing background noise levels at the nearest noise sensitive properties to the proposed plant;

b) based on (a) to determine external plant noise limits for the proposed plant, in accordance with Camden Council's requirements;

c) to predict noise emissions from the proposed plant at the nearest noise-sensitive properties and compare these with the external plant noise limits to assess compliance with Camden Council's acoustic requirements.

Following this introductory section, a description of the site is given in Section 3. A description of the survey methodology is given in Section 4 with results presented in Section 5 and Appendix B. Plant noise limits are proposed in Section 6 and noise from the proposed condenser fan table assessed in Section 7. Appendix A presents an explanation of the acoustic terminology used in this report.

3 SITE DESCRIPTION

15-17 Jockey's Fields is a 3-storey office building. Whilst on site it was noted that the immediate surrounding buildings are mostly commercial premises. The nearest noise sensitive properties to the site are noted to be the residential properties at 19 Jockey's Fields, 3 Raymond Buildings and 13 Bedford Row.

Figure 3.1 below shows the site and its surroundings, and indicates the nearest noise sensitive properties in green.

Figure 3.1 Location of Site and Surroundings

4 SURVEY METHODOLOGY

An unmanned environmental noise survey was undertaken between approximately 13:30 hours on Thursday 16 December 2010 and approximately 13:30 hours on Friday 17 December 2010, and between approximately 11:00 hours on Monday 29 May 2012 to 11:00 hours on Tuesday 30 May 2012.

L_{Amax}, L_{Aeq} and L_{A90} noise levels were measured throughout the unmanned noise survey. The unmanned measurements were undertaken over contiguous 100 millisecond intervals.

The measurement positions are indicated on Figure 4.1 and described in Table 4.1.

Figure 4.1 Site Plan Indicating Measurement Positions

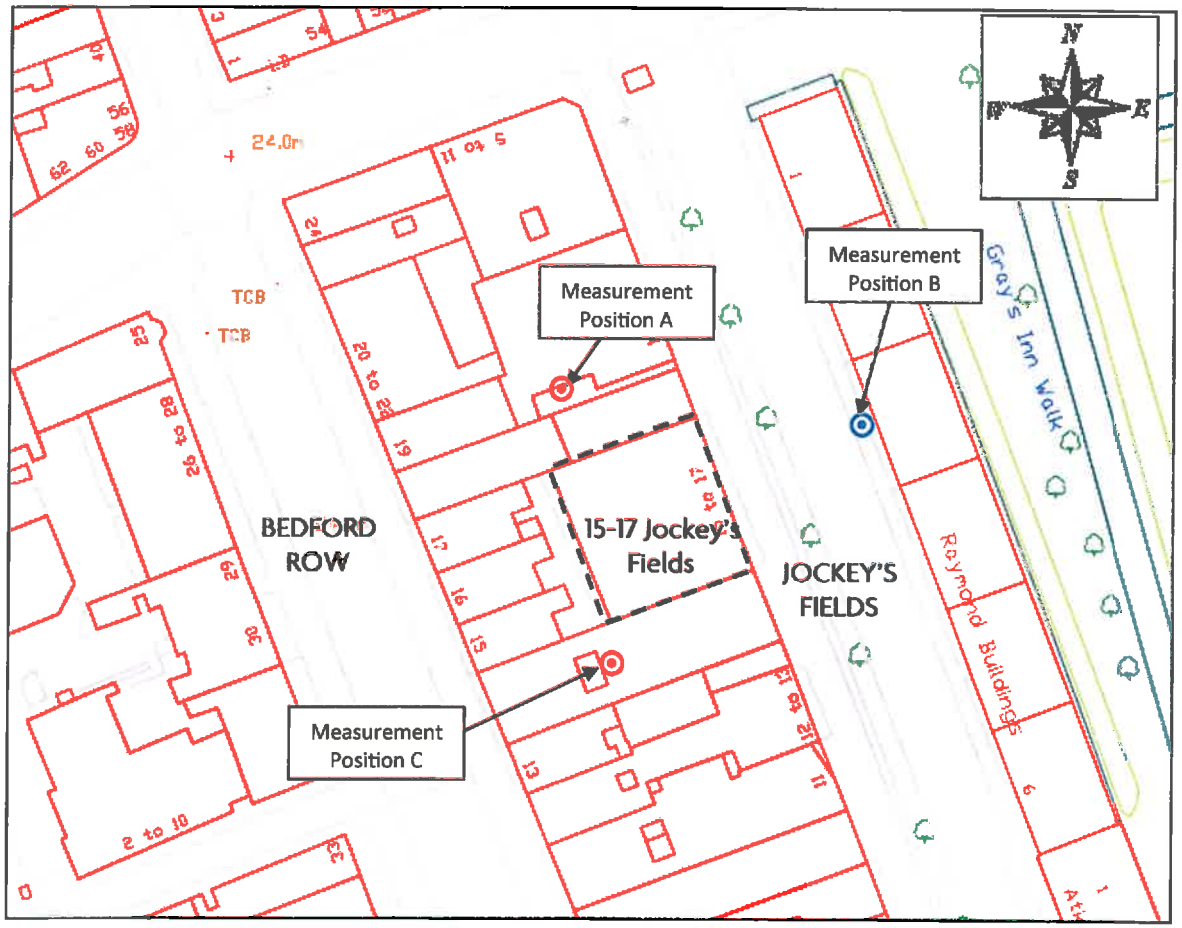


Table 4.1 Description of Noise Measurement Positions

Measurement Position	Description
A	Protruding from the railings, at 2nd floor roof level, on the balcony of the residential property at 19 Jockey's Fields.
B	Measurement microphone protruding from third floor level window in the west/south-west façade of 3 Raymond Buildings.
C	On the roof (first floor level) of the link building between 14 Bedford Row and 14 Jockeys Fields, attached to a railing at the south western corner of the roof area, approximately 1.5m above the roof and approximately 2m from the nearest window of 13 Bedford Row

The measurement positions were selected as being representative of background noise levels affecting the nearest noise sensitive properties at 19 Jockey's Fields, 3 Raymond Buildings and 14 Bedford Row.

The equipment used for the noise survey is summarised in Table 4.2.

Table 4.2 Description of Equipment used for Noise Survey

Measurement Position	Equipment	Description	Quantity	Serial Number
A & B	01 dB Solo	Type 1 automated logging sound level meter	1	60447
	01 dB PRE 21	Type 1 ½" microphone and pre-amplifier	1	13259
	01 dB BAP 21	Outdoor microphone casing	1	10935
C	01 dB Solo	Type 1 automated logging sound level meter	1	60461
	01 dB PRE 21	Type 1 ½" microphone and pre-amplifier	1	13419
	01 dB BAP 21	Outdoor microphone casing	1	10935
All	01 dB CAL 21	Calibrator	1	50441990

Due to the nature of the unmanned noise survey we are unable to comment on the weather conditions throughout the entire noise survey periods. However, at the beginning of the unmanned noise survey period at position A there was noted to be light rainfall and only light wind. At the end of the unmanned noise survey period at position A there was noted to be no rainfall, a cloudy sky and only light wind. We also understand that during the morning of Friday 17 December 2010 there was a brief, light snow shower.

At the beginning and end of the survey at positions B and C, there was no rainfall, light wind and a clear sky. We understand these weather conditions were approximately representative of the survey periods.

The noise monitoring equipment used was calibrated before and after the noise surveys. No significant change was found.

5 SURVEY RESULTS & OBSERVATIONS

5.1 Environmental Noise Survey Results

Appendix B presents a time history graph showing the A-weighted (dBA) L_{max}, L_{eq} and L_{90} noise levels measured throughout the unmanned noise survey at each measurement position.

We would consider the noise levels measured to be representative of the typical background noise climate, considering the location of the measurement position and the dominant nearby noise sources.

The lowest measured 10-minute background L_{90} (dBA) noise levels at the measurement positions during the proposed plant operating hours (daytime/typical office hours i.e. 07:00 – 18:00 hours) are summarised in Table 5.3 below.

Table 5.3 Lowest Measured Daytime/Typical Office Hours, Evening and Night-time Background L_{90} Noise Levels

Measurement Position	Lowest Measured L_{90} Background Noise Level (dBA) during Daytime/Typical Office Hours (07:00 – 18:00 hours)
A	50
B	50
C	49

5.2 Observations

Due to the nature of the unmanned noise survey we are unable to comment on the exact noise climate throughout the entire unmanned noise survey period. However, at the beginning and end of the unmanned survey period, the daytime noise climate at unmanned measurement position A was noted to be dominated by general background noise from distant road traffic. At the beginning of the unmanned survey period, occasional intermittent noise from internal building works on the ground floor of 19 Jockey's Fields was also noted to be audible at measurement position A. However, we do not expect this noise to have affected the lowest background noise levels measured over the full survey period.

We expect that night-time noise levels at measurement position A were affected by general ambient noise (distant road traffic, etc.).

At the beginning and end of the measurements at position B, the noise climate was noted to be affected by road traffic along Theobalds Road. The noise climate at position C was noted to be affected by general distant road traffic.

6 EXTERNAL PLANT NOISE LIMITS

We understand 15-17 Jockey's Fields lies within the jurisdiction of Camden Council). We understand Camden Council's typical requirements regarding plant noise are as follows: [1]

"The Council will only grant planning permission for plant or machinery, including ventilation or air handling equipment, if it can be operated without causing a loss to local amenity and does not exceed the thresholds..."

Thresholds for noise levels from plant and machinery at which planning permission will not be granted by Camden Council are shown in Table 6.1 below.

Table 6.1 Plant and Machinery Noise Level Thresholds at which Planning Permission will not be Granted

Noise Description and location of measurement	Period	Time	Noise Level
Noise at 1 metre external to a sensitive façade	Day, Evening and Night	00:00 – 24:00	5dB(A) less than L_{A90}
Noise that has a distinguishable discrete continuous note (whine, hiss, screech, hum) at 1 metre external to a sensitive façade	Day, Evening and Night	00:00 – 24:00	10dB(A) less than L_{A90}
Noise that has distinct impulses (bangs, clicks, clatters, thumps) at 1 metre external to a sensitive façade	Day, Evening and Night	00:00 – 24:00	10dB(A) less than L_{A90}
Noise at 1 metre external to a sensitive façade where L_{A90} > 60dB	Day, Evening and Night	00:00 – 24:00	55dB L_{Aeq}

Due to the character of the chiller noise, we have determined plant noise limits based on Camden Council's requirements (see Table 6.1) for *"noise that has a distinguishable discrete continuous note"*.

Based on Camden Council's requirements and the lowest measured 10-minute background L_{90} (dBA) noise levels during the proposed plant operating hours (daytime/typical office hours i.e. 07:00 – 18:00 hours), we would propose the plant noise limits shown in Table 6.2, to be achieved by the proposed plant during the relevant operating period, when measured 1m external to the nearest noise-sensitive façade.

Table 6.2 Proposed External Plant Noise Limits – Noise Sensitive Properties

Measurement Position	Lowest Measured L_{90} Background Noise Level (dBA) during Daytime/Typical Office Hours (07:00 – 18:00 hours)
Residential Façade at 19 Jockey's Fields	40
3 Raymond Buildings	40
13 Bedford Row	39

The above external plant noise limits would be subject to approval by Camden Council.

7 PLANT NOISE ASSESSMENT

We understand a single Trane Model RJC 090.2 Condenser Fan Table is to be located at roof level of 15/17 Jockey Fields at the location indicated on Drawing No KEN1068/RF/GA/02 rev B by NAI Haywoods.

We understand the noise level of the proposed Condenser Fan Table is 40dBA at 10 metres.

The distance to the nearest noise sensitive facades at 19 Jockey's Fields and 3 Raymond Buildings is greater than 10 metres, therefore the resultant plant noise level at these façades will be less than the 40 dBA limit.

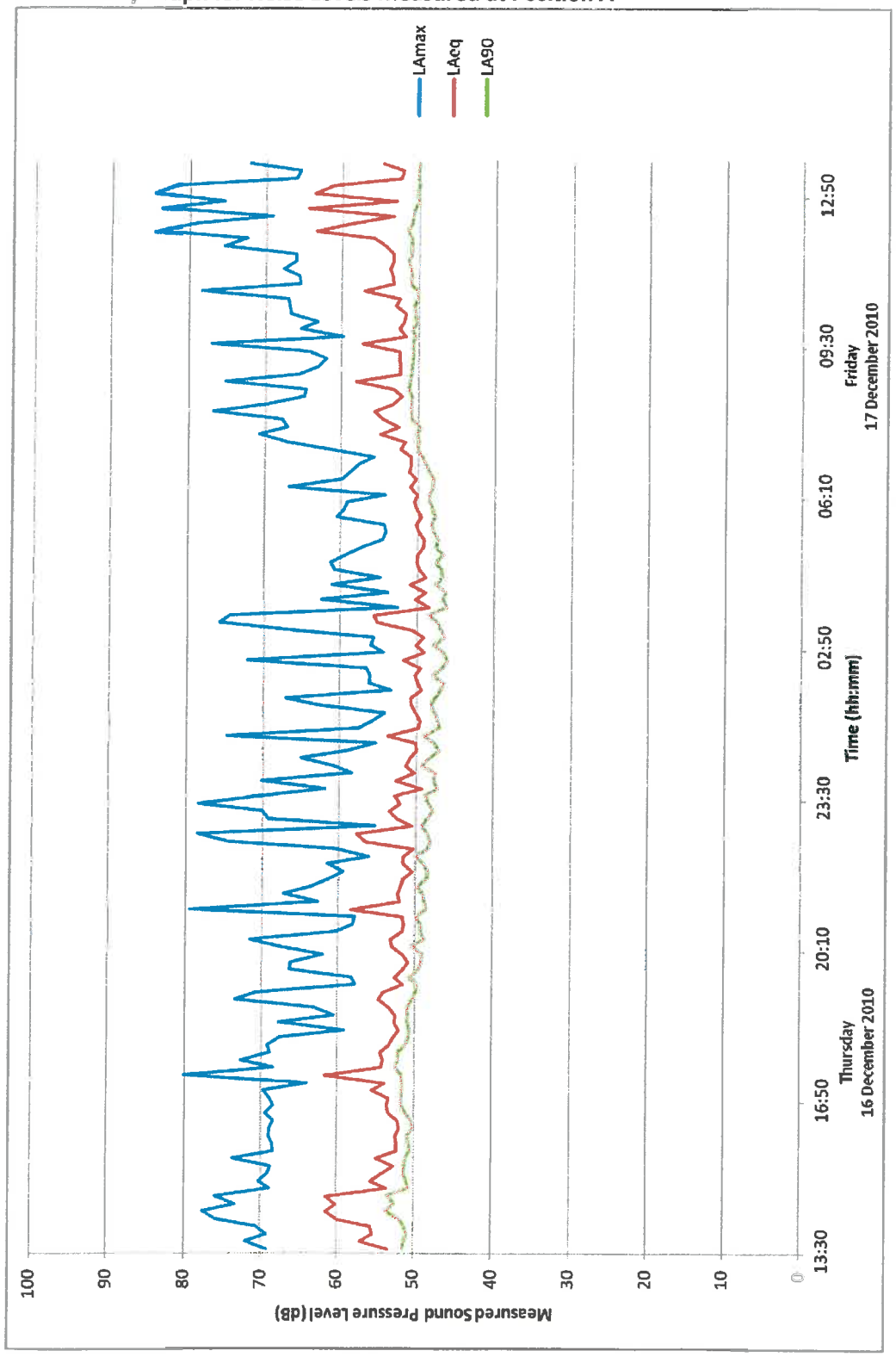
The distance to the nearest noise sensitive façade at 13 Bedford Row is at least 25m. Therefore, our calculations indicate that distance attenuation alone at this façade would reduce the plant noise levels by approximately 8 dBA. The plant noise levels would also be subject to attenuation due to the effect of screening from intervening structures. Therefore, the resultant plant noise level at this façade would be less than the 39 dBA limit.

APPENDIX A: ACOUSTIC TERMINOLOGY

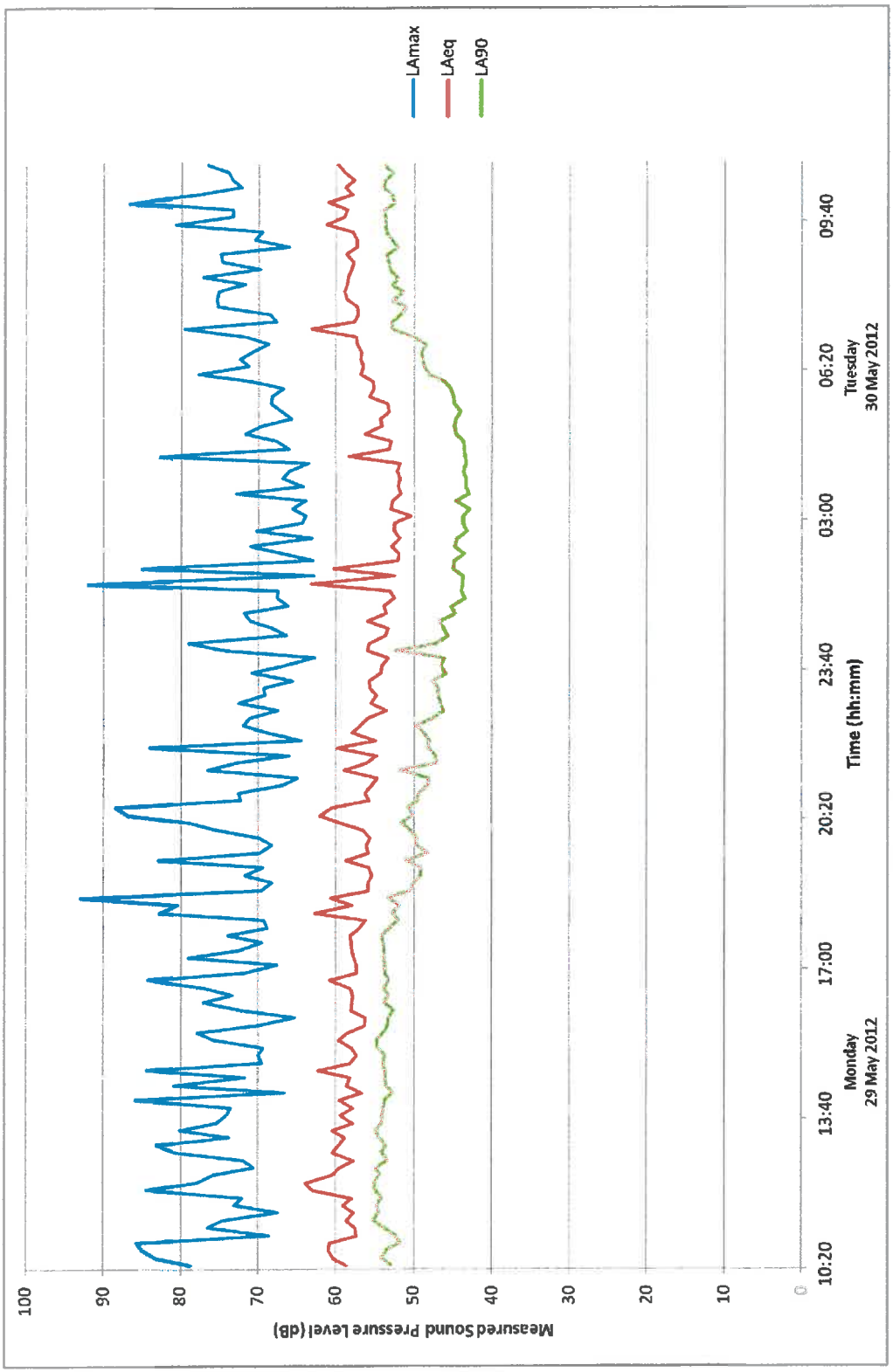
Parameter	Description
Decibel (dB)	A logarithmic scale representing the sound pressure or power level relative to the threshold of hearing ($20x10^{-6}$ Pascals).
Sound Pressure Level (L_p)	The sound pressure level is the sound pressure fluctuation caused by vibrating objects relative to the threshold of hearing.
A-weighting (L_A or dBA)	The sound level in dB with a filter applied to increase certain frequencies and decrease others to correspond with the average human response to sound.
$L_{Aeq,T}$	The A-weighted equivalent continuous noise level over the time period T (typically T= 16 hours for daytime periods, T = 8 hours for night-time periods). This is the sound level that is equivalent to the average energy of noise recorded over a given period.
$L_{n,T}$	The noise level exceeded for n% of the time over a given period T. e.g. L_1, the noise level exceeded for 1% of the time L_{90}, the noise level exceeded for 90% of the time (background noise level).

APPENDIX B: UNMANNED NOISE SURVEY RESULTS

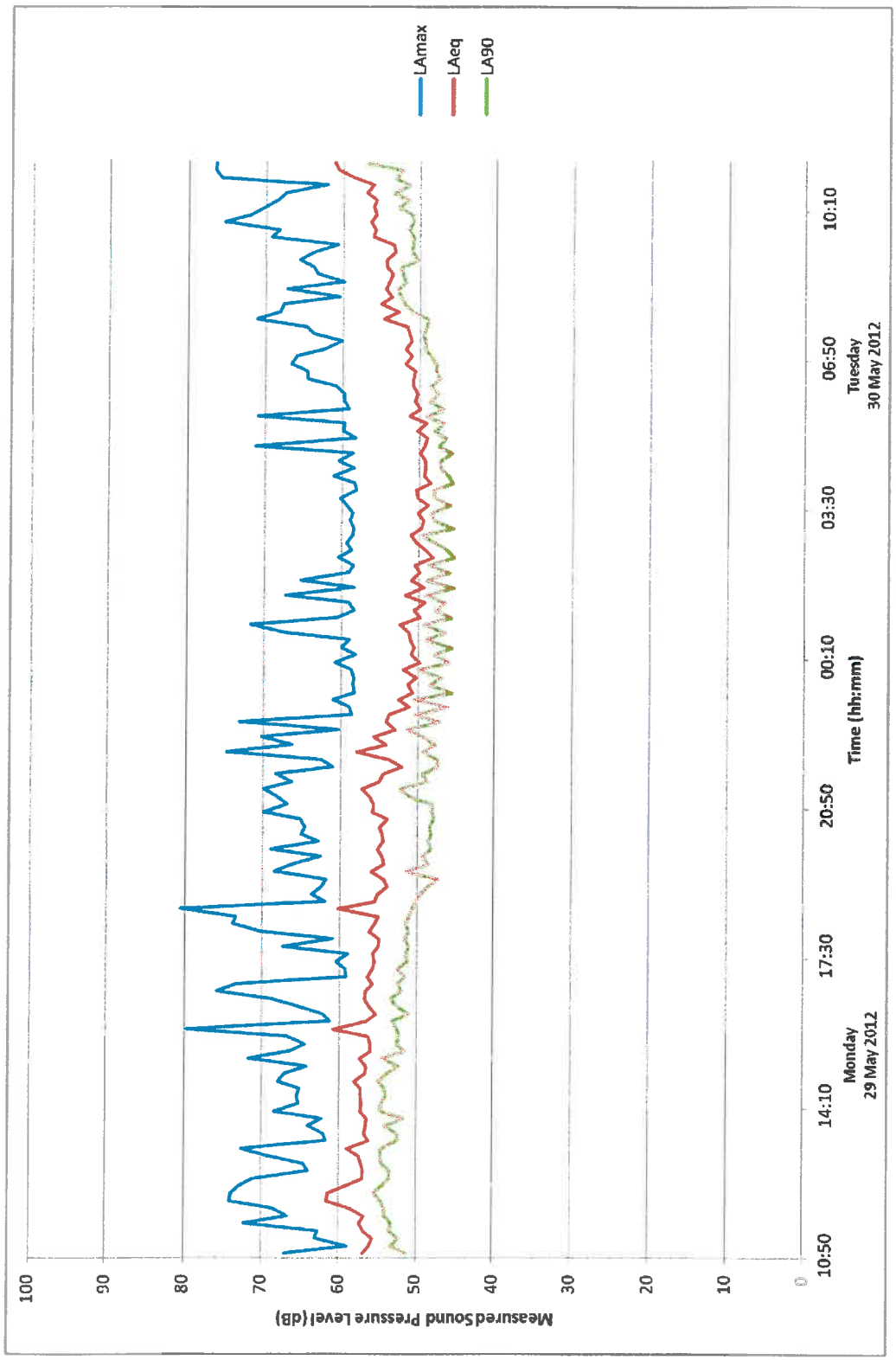
Time History Graph for Noise Levels Measured at Position A



Time History Graph for Noise Levels Measured at Position B



Time History Graph for Noise Levels Measured at Position C



DOCUMENT CONTROL & REFERENCES

Hilson Moran Partnership Limited, One Discovery Place, Columbus Drive, Southwood West, Farnborough, Hampshire, GU14 0NZ

Change History

Issue 0.1	21 December 2012	Draft document for review.
Issue 0.2	21 December 2012	Document reviewed.

Changes Forecast

None.

Document References

[1] London Borough of Camden *Replacement UDP*, Adopted June 2006