RBA ACOUSTICS

30 LEIGHTON ROAD KENTISH TOWN LONDON

EXTERNAL BUILDING FABRIC ASSESSMENT

REPORT 7193/EBF
Prepared: 22 December 2015
Revision Number: 0

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External Building Fabric Assessment

30 LEIGHTON ROAD
KENTISH TOWN
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Revision	Comment	Date	Prepared By	Approved By
0	First Issue	22 December 2015	Christopher Wilson	Andrew Heath

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1.0 INTRODUCTION

It is proposed to redevelop the site at 30 Leighton Road, Kentish Town to provide 5No. Maisonettes, 2No. 1 bedroom flats and 2No. live/work units.

The site is located on Leighton Road backing onto Kentish Town Railway Station. The surrounding roads and walkways are noted as having regular traffic flow.

An assessment has been carried out in relation to the noise levels likely to be incident on the proposed building façades to demonstrate that noise will not unduly affect the future occupants of the residential areas of the redevelopment.

RBA Acoustics have been commissioned by Studio Mackereth to undertake a noise survey and subsequent analysis of noise levels incident on the proposed redevelopment.

This report presents the results of the noise survey, details of suitable internal noise criteria which are typically required by the Local Authority and sets out the likely acoustic performance requirements of the external building fabric elements for these to be achieved.

2.0 ENVIRONMENTAL NOISE SURVEY

2.1 Survey Methodology

General

Continuous noise monitoring was undertaken at the redevelopment site between Friday 18 December and Monday 21 December 2015 in order to determine the corresponding noise levels over typical day and night-time periods. Weather conditions over the monitoring period were subject to intermittent rain and light wind, but were considered suitable for noise monitoring for the purposes of this assessment.

Instrumentation

The following instrumentation was used for the survey:

Table 7193/T1 – Equipment Details

Manufacturer	Model Type	Serial No.	Calibration	
			Certificate No.	Expiry Date
Norsonic Type 1 Sound Level Meter	Nor140	1406258	471264946	17 March 2017
Norsonic Pre Amplifier	1209	20490		
Norsonic ½" Microphone	1225	225526		
Norsonic Sound Calibrator	1251	34397	CAL 022-2015-5252	9 April 2017

The sound level meter was calibrated both prior to and on completion of the survey with no calibration drift observed.

Measurement Position

A microphone was located on the Southern boundary of the site raised 4m above ground level, overlooking Kentish Town Station. The results at this measurement location are considered to be in free field conditions.

The measurement position is shown on the attached Site Plan 7193/SP1 and Photograph 7193/P1.

The measurement position is considered to be representative of worst-case noise levels incident on the proposed residential aspects of the re-development.

2.2 Site Conditions

Since the measurements were unattended it is not possible to comment upon the noise climate at each measurement position over the entire monitoring period with absolute certainty. However, during our time on site it was noted that noise levels were dominated by activities at Kentish Town Station.

2.3 Results

The measured L_{Aeq}, L_{A90} and L_{Amax} 15 minute period levels are shown as time-histories on the attached Graphs 7193/G1-G2. The averaged daytime, evening and night-time L_{Aeq} noise levels are summarised in Table 7193/T2.

Table 7193/T2 – Measured L_{Aeq} Noise Levels

Measured L_{Aeq} Noise Level (dB)		
Daytime (07:00 – 19:00)	Evening (19:00 – 23:00)	Night-time (23:00 – 07:00)
61	61	56

The minimum background noise levels ($L_{A90,\ 15mins}$) at each measurement position are summarised in Table 7193/T3.

Table 7193/T3 – Measured Minimum $L_{A90,\ 15mins}$ Noise Levels

Minimum $L_{A90,\ 15mins}$ Noise Level During Period (dB)		
Daytime (07:00 –19:00)	Evening (19:00 – 23:00)	Night-Time (23:00 – 07:00)
43	45	41

Averaged spectral noise levels are graphically represented on the attached Graphs 7193/G3.

3.0 EXTERNAL BUILDING FABRIC CRITERIA

3.1 Local Authority Requirements

From previous experience of similar schemes, The London Borough of Camden are likely to make reference to Appendix 1 Table B of their UDP reproduced in Table 7193/T4. This refers directly to properties in close proximity of a railway line.

Table 7193/T4 – Camden UDP Railway Criteria

Noise levels on residential sites adjoining railways at and above which attenuation measures will be required			
Noise description and location of measurement	Period	Time	Sites adjoining railways
Noise at 1m external to sensitive façade	Day	07:00-19:00	65dB $L_{Aeq,12h}$
Noise at 1m external to sensitive façade	Evening	19:00-23:00	60dB $L_{Aeq,12h}$
Noise at 1m external to sensitive façade	Night	23:00-07:00	55dB $L_{Aeq,12h}$

When correcting back the levels measured in Table 7193/T2 to the nearest façade (-2.5dB distance attenuation), all measured levels are below those outlined in Table 7193/T4.

We also make reference to the following standards.

3.2 BS 8233

BS 8233:2014 Guidance on sound insulation and noise reduction for buildings, draws on the results of research and experience such as that detailed in WHO 'Guidelines for Community Noise', to provide information on achieving internal acoustic environments appropriate to their functions.

As part of this document, recommendations are given for the internal noise levels which are commensurate with achieving comfortable resting and sleeping conditions within residential properties. The values given are generally in terms of an L_{Aeq} level, although guidance is also given on the maximum noise level considered reasonable within bedrooms at night. The values given in Table 7014/T5 below are taken from Section 7.7.2, Table 4 of BS 8233:2014.

Table 7193/T5 – BS8233 Residential Noise Level Guidance

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living Rooms	35 dB $L_{Aeq,16hour}$	-
Sleeping (or Resting in Daytime)	Bedrooms	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,8hour}$

Guidance for the maximum noise level considered reasonable within bedrooms at night is not specifically stated for residential spaces, however the following L_{Amax} noise levels are outlined as guidance for the maximum levels to be received in hotel bedrooms:

Table 7193/T6 – BS8233 Maximum Noise Levels in Hotel Bedrooms

Period	Location	Design Range
Night-Time (23:00 - 07:00)	Hotel Bedrooms	45-55 dB $L_{Amax,F}$

A brief explanation of the acoustic terminology used in this report is shown within Appendix A.

3.3 World Health Organisation: Guidelines for Community Noise

The document describes guideline levels that are "*essentially values for the onset of health effects from noise exposure*".

A table of guideline values is included, relating to adverse health effects, referred to as any temporary or long term deterioration in physical, psychological, or social functioning that is associated with noise exposure.

The following is an extract from the Table 4.1: Guideline values for community noise in specific environments, as stated in the document.

Table 7014/T7 – Guideline Values for Community Noise

Specific Environment	Critical Health Effect(s)	L_{Aeq} (dB)	Time Base (hours)	$L_{Amax,f}$ (dB)
Outdoor living area	Serious annoyance, daytime and evening	55	16	-
	Moderate annoyance, daytime and evening	50	16	-
Dwelling, indoors	Speech intelligibility and moderate annoyance, daytime and evening	35	16	-
Inside bedrooms	Sleep disturbance, night-times	30	8	45

3.4 Summary of Criteria

Based upon the information from the relevant standards outlined above and our previous experience of Local Authority requirements, we propose the following noise level criteria are suitable in providing suitable acoustic conditions within the proposed residential and live/work areas of the development:

- Living Rooms: 35 dBA Daytime (07:00 – 23:00)
- Bedrooms: 35 dBA Daytime (07:00 – 23:00)
  30 dBA Night-Time (23:00 – 07:00)
  45 dB $L_{Amax,F}$ Night-Time (23:00 – 07:00)

4.0 EXTERNAL BUILDING FABRIC ASSESSMENT

4.1 Background

Appropriate internal noise levels can be achieved providing suitable building envelope constructions are employed. Analyses of the external building fabric have been undertaken in order to ascertain the required acoustic performance of the glazing and other external fabric elements to achieve the project criteria.

4.2 Assumptions

Our external building fabric analyses have assumed the following:

a) Drawings

Our assessment has been based on the following Studio Mackereth's proposed drawings.

Drawing Number	Description	Revision	Date
110	Proposed Site Plan	B	April 2015
141	Proposed Apartments Plan- GF	B	April 2015

(b) Noise Levels

The assessment has been based on the measured noise levels as detailed in Section 2.3.

(c) Room Absorption

We have assumed the bedrooms to be acoustically "soft" with carpets, curtains and other soft furnishings. For the purposes of our analyses we have assumed the following absorption coefficients.

Table 7193/T8 – Bedroom Absorption Coefficients

Absorption Coefficient (a) at Octave Band Centre Frequency (Hz)							
63	125	250	500	1k	2k	4k	8k
0.15	0.18	0.25	0.27	0.31	0.32	0.32	0.32

We have assumed the living rooms to be less acoustically absorptive (with a hard floor finish, although with furnishings). For the purposes of our analyses we have assumed the following absorption coefficients:

Table 7193/T9 – Living Room Absorption Coefficients

Absorption Coefficient (a) at Octave Band Centre Frequency (Hz)							
63	125	250	500	1k	2k	4k	8k
0.15	0.18	0.20	0.22	0.22	0.22	0.23	0.27

(d) External Wall

We understand that external non-glazed façade areas are brickwork and therefore we have assumed the following sound reduction indices (equating to an overall R_W of 52dB) for all non-glazed façade areas.

Table 7193/T10 – Non-Glazed SRIs

Assumed Sound Reduction Index (dB) at Octave Band Centre Frequency (Hz)							
63	125	250	500	1k	2k	4k	8k
36	41	45	45	54	58	58	58

(e) Ventilation

It is understood the chosen ventilation strategy is via a mechanical ventilation and heat recovery system (MVHR). Should the proposals for ventilation change to include mechanisms such as trickle ventilators, it is important that RBA Acoustics is informed at the earliest opportunity as alternative vents could have a significant impact on the sound insulation performance for the building.

4.3 Preliminary Assessment

The results of our analyses indicate that appropriate internal noise levels can be achieved within the worst case areas of the re-development using double glazing and MVHR ventilation. Table 7193/T11 outlines a suitable glazing configuration and ventilation type which are commensurate with achieving the proposed internal noise criteria.

Table 7193/T11 – Glazing and Ventilation Guidance Constructions (Worst affected façade)

Glazing Configuration	Ventilation Type
Double glazing comprising 10mm glass / 12mm cavity / 6mm glass	MVHR

5.0 CONCLUSION

RBA Acoustics have undertaken noise monitoring at the proposed site at 30 Leighton Road, Kentish Town and the measured noise levels are presented herein. The resultant noise levels have been used in our assessment of the glazing requirements to demonstrate suitable internal noise levels can be achieved at the proposed development with reference to BS 8233, the WHO and typical Local Authority criteria.

We do not consider planning approval should be rejected on the basis of noise and can confirm internal noise levels can be effectively controlled using double-glazing and MVHR ventilation.

Appendix A - Acoustic Terminology

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_{eq}	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 (1 hour).
L_{Aeq}	The level of notional steady sound which, over a stated period of time, would have the same A-weighted acoustic energy as the A-weighted fluctuating noise measured over that period.
L_{An} (e.g. L_{A10}, L_{A90})	If a non-steady noise is to be described it is necessary to know both its level and the degree of fluctuation. The L_n 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.
$L_{max,T}$	The instantaneous maximum sound pressure level which occurred during the measurement period, T. It is commonly used to measure the effect of very short duration bursts of noise, such as for example sudden bangs, shouts, car horns, emergency sirens etc. which audibly stand out from the general level of, say, traffic noise, but because of their very short duration, maybe only a very small fraction of a second, may not have any effect on the L_{eq} value.

30 Leighton Road

L_{Aeq} Time History

Position 1- Friday 18th to Monday 21st December 2015

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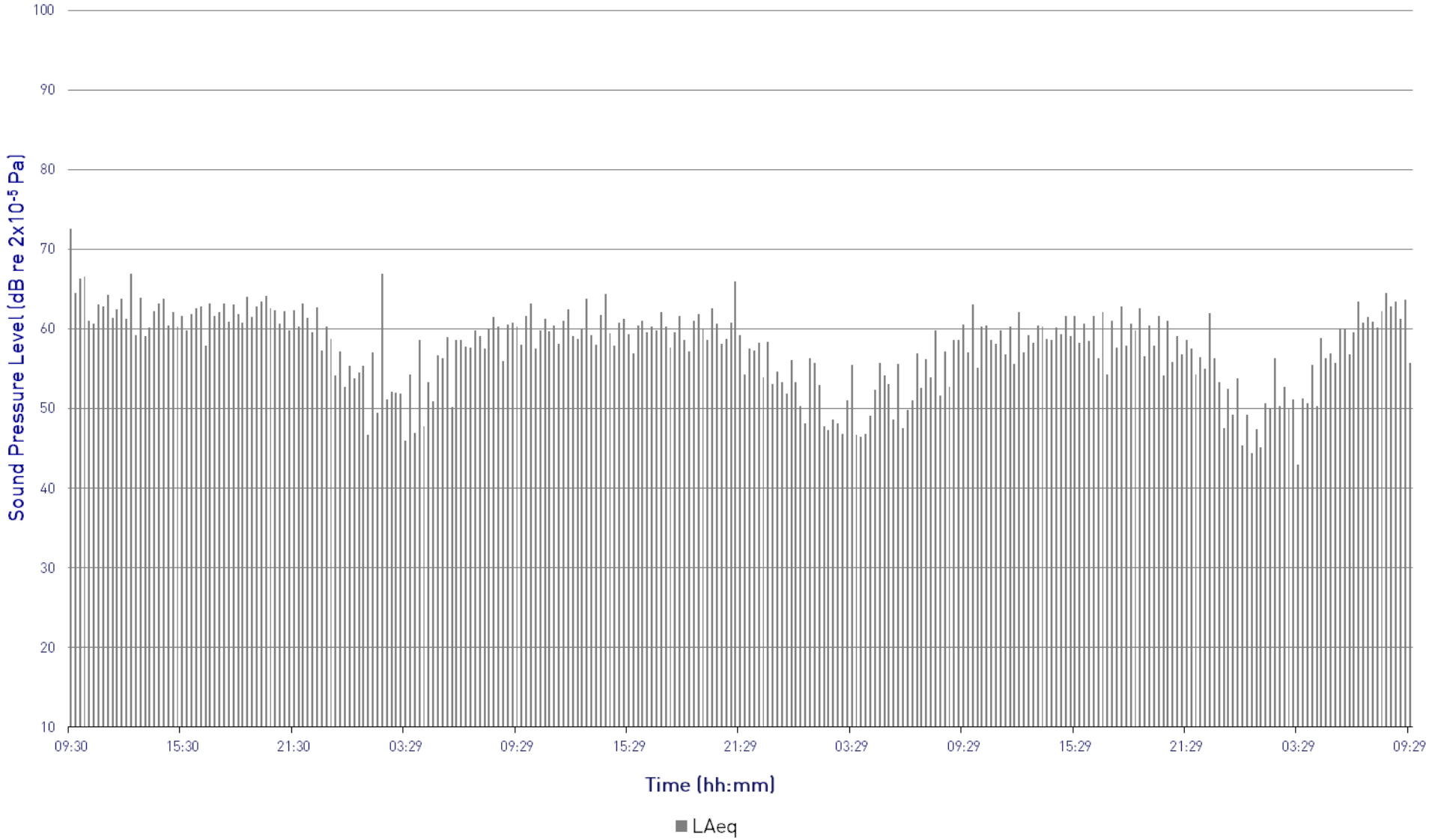
Graph 7193/G1



30 Leighton Road

L_{Amax} and L_{A90} Time History

Position 1- Friday 18th to Monday 21st December 2015

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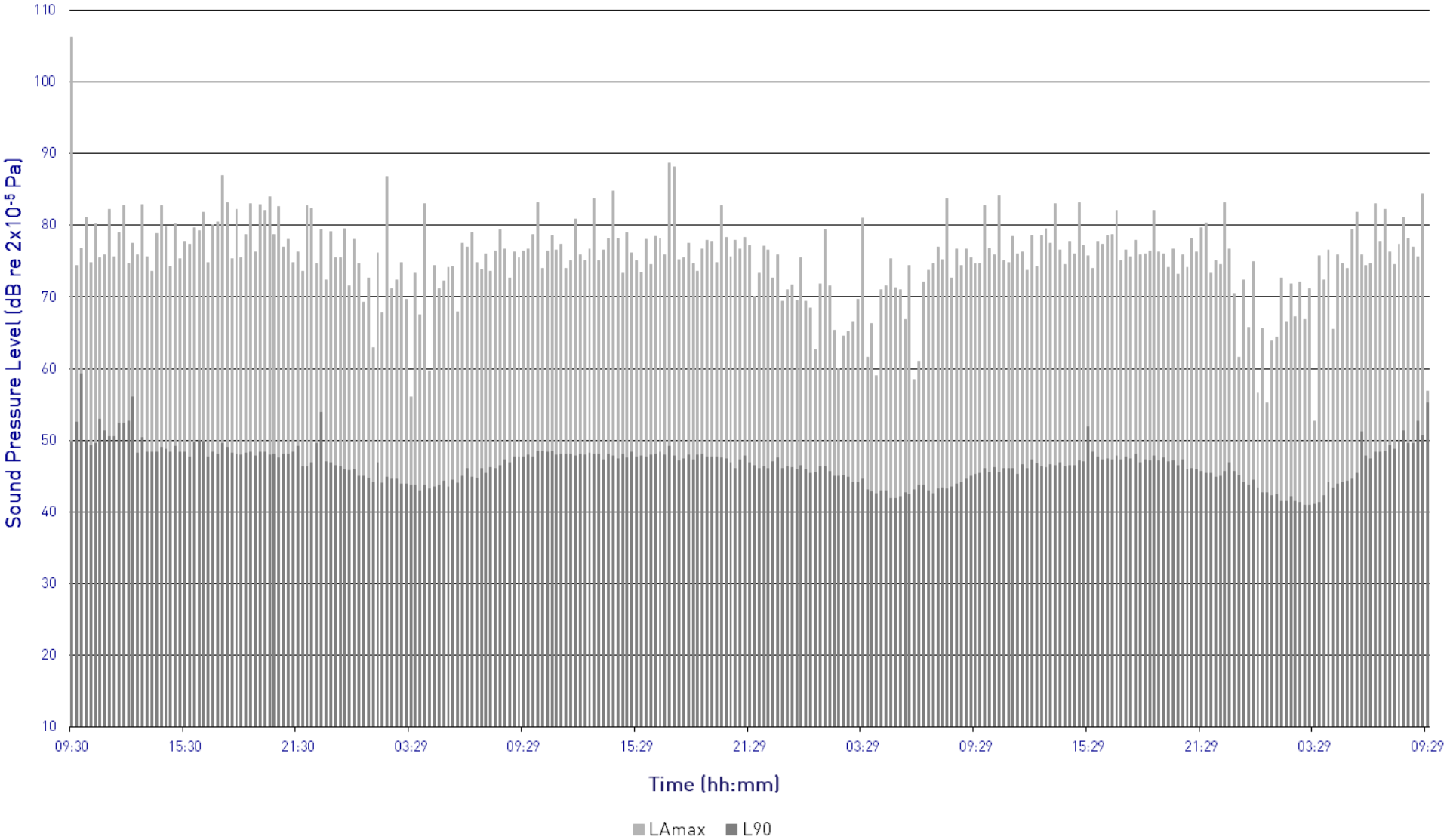
Graph 7193/G2



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Spectral Noise Levels

Position 1- Friday 18th to Monday 21st December 2015

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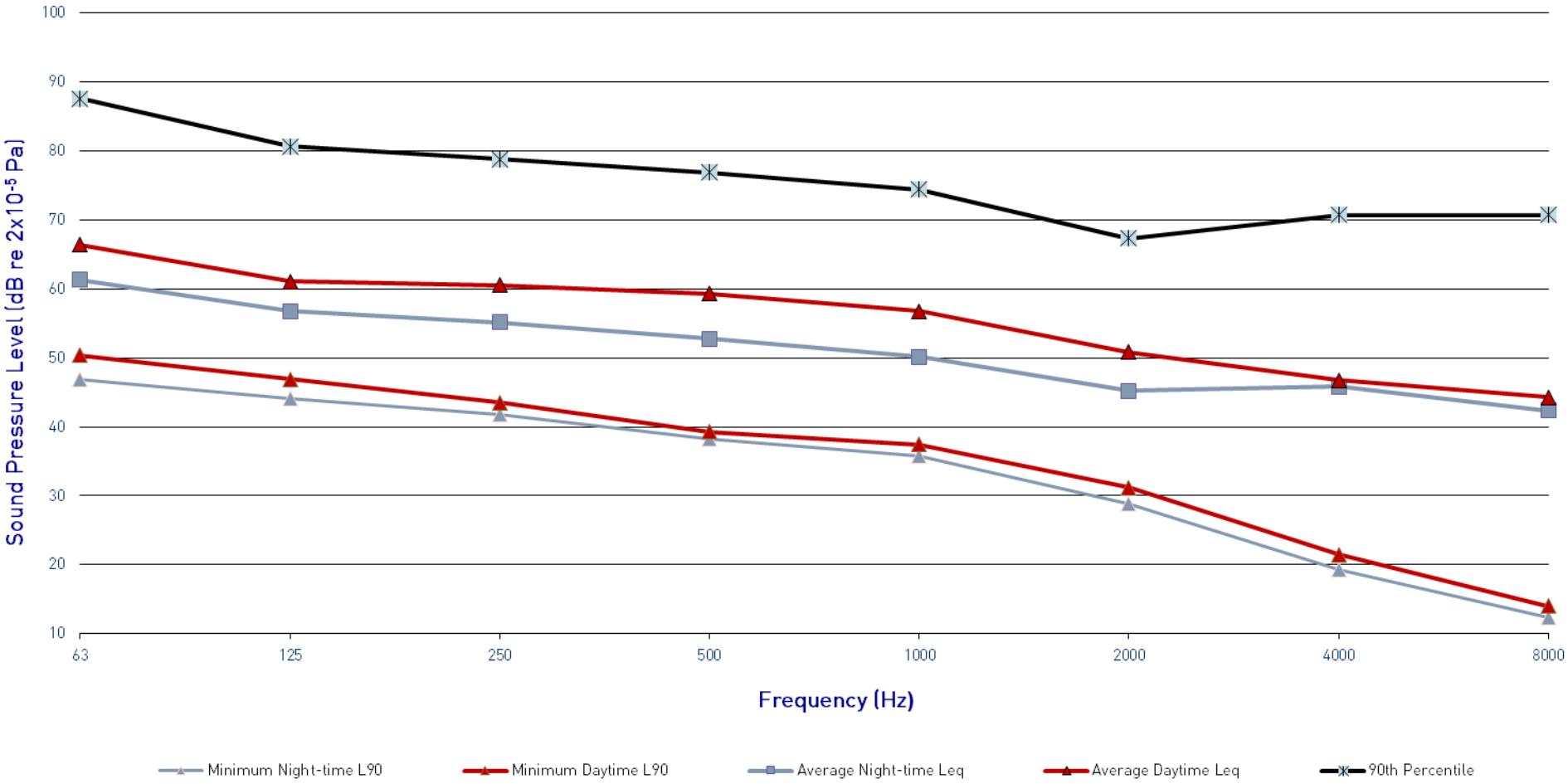
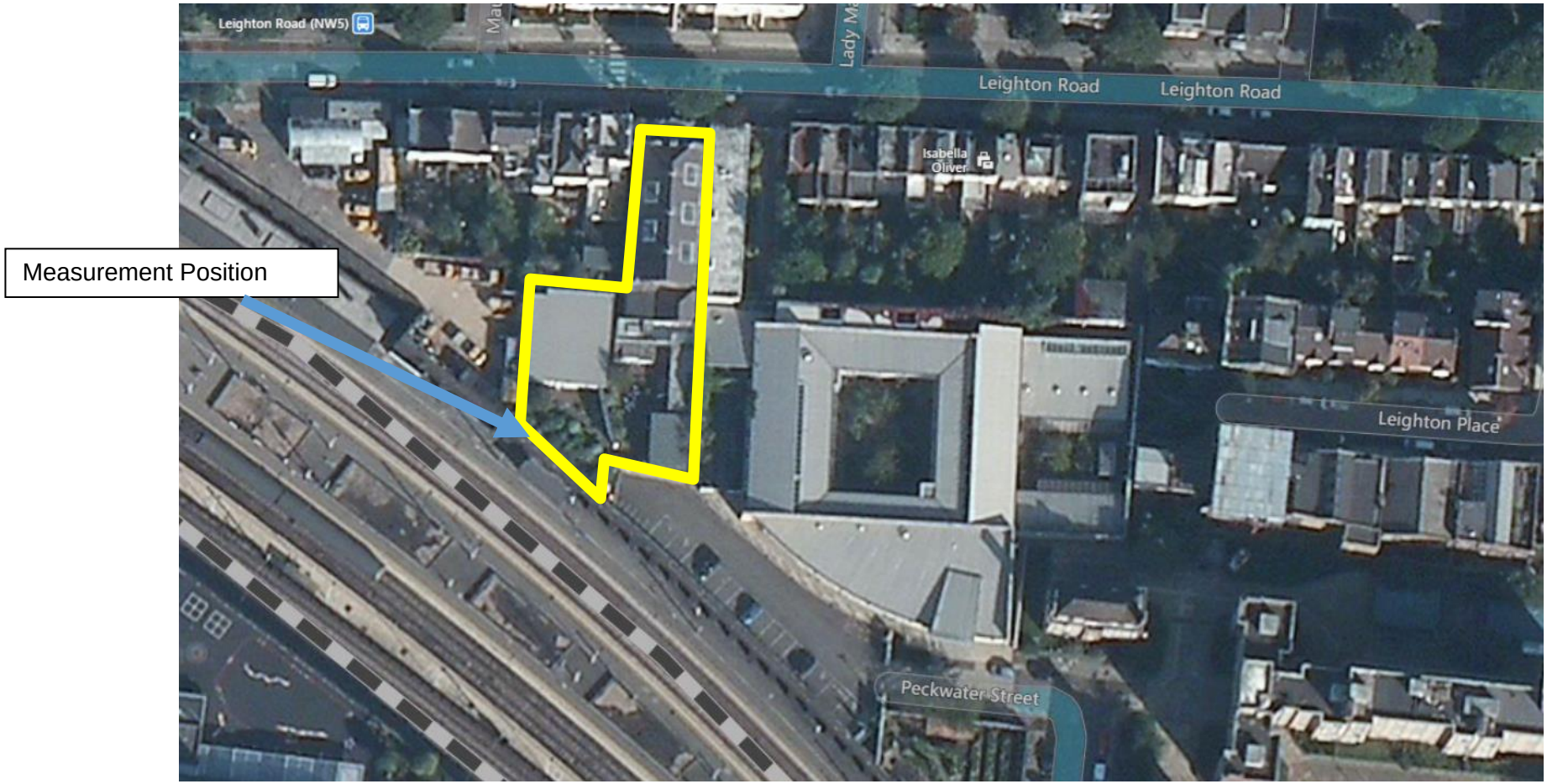
Graph 7193/G3





30 Leighton Road, Kentish Town

Site Plan Showing Measurement Position

Site Plan 7193/SP1

22 December 2015

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30 Leighton Road, Kentish Town

Photograph Showing Measurement Position

Photograph 7193/P1

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