

79-86 CHANCERY
LANE,
LONDON

Boiler Flue Noise Assessment

REPORT 5629/BFN

Prepared: 24 February 2015

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Boiler Flue Noise Assessment



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LONDON

REPORT 5629/BN

Prepared: 24 February 2015

Revision	Comment	Date	Prepared By	Approved By
Zero	First issue of report	12 February 2015	Robert Barlow	Torben Andersen
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1.0 INTRODUCTION

In order to satisfy the planning permission for the location of new boiler units at 79-86 Chancery Lane, London, the London Borough of Camden require consideration be given to atmospheric noise emissions from such installations to the nearest noise sensitive property.

RBA Acoustics have previously undertaken measurements of the prevailing noise conditions at the site at planning stage to determine the atmospheric noise emissions in accordance with the London Borough of Camden's requirements.

This report presents the results of the noise measurements, associated criteria and provides the required assessment.

2.0 ENVIRONMENTAL NOISE SURVEY

2.1 General

Noise monitoring was undertaken at planning stage before the commencement of construction any works on site. The results of the noise survey are therefore considered representative of the baseline noise environment at the development site.

In accordance with the requirements of the Local Authority, monitoring of the prevailing background noise was previously undertaken over the following period:

- Tuesday 18 September to Wednesday 19 September 2012

During the survey period the weather conditions were generally appropriate for the noise measurement exercise, it being dry with low wind speeds.

Measurements were made of the L_{A90} , L_{Amax} and L_{Aeq} noise levels over sample periods of 15 minutes duration.

2.2 Measurement Location

Measurements were undertaken with the microphone positioned at roof level of 81 Chancery Lane. This measurement position was considered as being representative of the noise climate as experienced at the closest receptors to any future plant installed at roof level.

The prevailing noise climate was predominantly affected by road traffic along Chancery Lane as well as existing building services noise in the vicinity.

2.3 Instrumentation

The following equipment was used for the measurements.

Table 5629/T1 – Equipment Details

Manufacturer	Model Type	Serial No.	Calibration	
			Certificate No.	Expiry Date
Larson Davis Type 1 Sound Level Meter	SLM824	3153	U11517	27 June 2013
Larson Davis Pre Amplifier	PRM902	4467		
Larson Davis ½" Microphone	2541	8177		
Larson Davis Calibrator	Cal 21	3321	U11516	27 June 2013

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

3.0 RESULTS

The noise levels at the measurement positions are shown as time-histories on the attached Charts 5629/G1 to G2.

In order to ensure a worst case assessment the lowest background L_{A90} noise levels measured have been used in our analyses. The lowest L_{A90} and the period averaged L_{Aeq} dB noise levels measured are summarised below.

Table 5629/T2 – Measured Levels

Measurement Period	Sound Pressure Levels	
	L_{90} (dBA)	L_{eq} (dBA)
Daytime & Evening (07:00 – 23:00)	46	58
Night-time (23:00 – 07:00)	43	51

4.0 CRITERIA

4.1 Planning Condition

The requirements of the London Borough of Camden for noise levels from new plant and machinery are detailed in Planning Condition 6 and repeated below:

"Noise levels at a point 1 metre external to sensitive facades shall be at least 5dB(A) less than the existing background measurement (LA90), expressed in dB(A) when all plant/equipment (or any part of it) is in operation unless the plant/equipment hereby permitted 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), then the noise levels from that piece of plant/equipment at any sensitive façade shall be at least 10dB(A) below the LA90, expressed in dB(A).

Reason: To safeguard the amenities of the adjoining premises and the area generally in accordance with the requirements of policy CS5 of the London Borough of Camden Local Development Framework Core Strategy and policies DP26 and DP28 of the London Borough of Camden Local Development Framework Development Policies."

4.2 BREEAM

In addition to the Local Authority requirements, there are also BREEAM requirements for new plant installations, as referred to in POL 08.

POL 08

A noise impact assessment in compliance with BS4142 has been carried out and the following noise levels measured / determined:

- a) Existing background noise levels at the nearest or most exposed noise-sensitive development to the proposed development; or at a location where background conditions can be argued to be similar.*
- b) The rating noise level resulting from the proposed noise source. This can be based upon reference to similar installations or sites, or determined by calculation.*

Where the rating level of the noise source from the site / building is equivalent to or less than the background noise level, the credit can be awarded.

4.3 Summary

Based upon the above, the following noise emission limits at the nearest noise sensitive apply (assuming the noise does not contain any of the characteristics detailed in the Planning Condition)

- | | | |
|---------------------|-----------------|-------|
| ▪ Daytime & Evening | (07:00 – 23:00) | 41 dB |
| ▪ Night-time | (23:00 – 07:00) | 38 dB |

5.0 ASSESSMENT

Our assessment has been based upon the following information:

5.1 Proposed Boiler Units

2No. Lochinvar Ecoforce 35/150 Water Heater
2No. Viessmann Vitocrassal 300 29-87kW Boiler

5.2 Position of Boiler Units

The equipment is to be located within a basement plantroom with a flue terminating at roof level of the building. The flue location is indicated on the attached Site Plan 5629/SP1.

5.3 Location of Nearest Windows

The closest residential windows to the plant were identified as being the 1st floor residential flats formed as part of the redevelopment works. These windows are approximately 20m and completely screened from the roof top boiler flue by the building mass.

The closest office windows would be the 5th floor of the development a distance of approximately 4m from the boiler flue termination.

5.4 Noise Levels

There is currently no information available regarding noise emissions from the boilers and water heaters. In such instances we recommend a limiting noise level be adopted. The supplier should be made aware of this requirement.

In order to achieve the project criteria, sound levels, as measured at 1m (on-axis) from the flue, should not exceed 55dBA (cumulative) with the following low frequency content not exceeded.

Table 5629/T3 – Low Frequency Flue Noise Criteria at 1m on axis

Noise Emissions Criterion (dB) 1m On-Axis at Octave Band Centre Frequency (Hz)		
63	125	250
65	62	58

These noise limits are considered to be typical and easily achievable.

If necessary the boilers should be attenuated to achieve noise levels referred to above. If required, attenuators should be fitted within the plant room before the flue vertically rises through the building to roof level.

In addition, the cumulative noise emissions criterion and the above levels should be achieved during the boiler's start-up modulating phase.

6.0 CONCLUSION

Measurements of the existing background noise levels at 79-86 Chancery Lane, London have previously been undertaken. The results of the measurements have been used in order to determine the required criteria for atmospheric noise emissions from the boiler installations in line with the requirements of the London Borough of Camden and BREEAM.

Limiting noise levels have been provided to ensure the required noise emission criteria are achieved. A noise limit of 55dBA at 1m from the flue termination point is recommended to achieve the daytime and night-time noise limits (41dBA and 38dBA respectively) required by the London Borough of Camden.

Appendix A - Acoustic Terminology

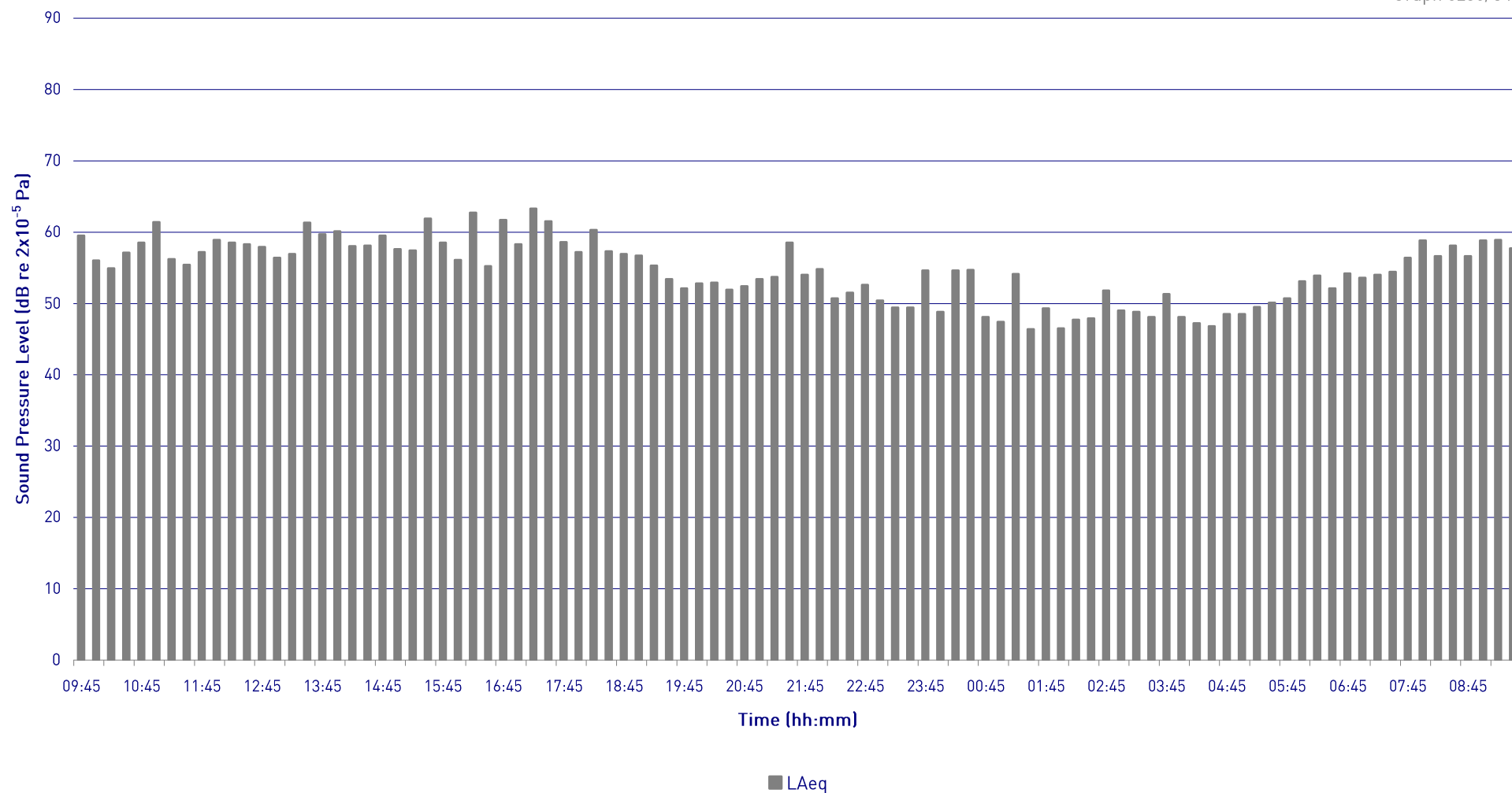
dB	Decibel - Used as a measurement of sound pressure level. It is the logarithmic ratio of the noise being assessed to a standard reference level.
dB(A)	The human ear is more susceptible to mid-frequency noise than the high and low frequencies. To take account of this when measuring noise, the 'A' weighting 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.

81 Chancery Lane, London

L_{Aeq} Time History

Tuesday 18 September to Wednesday 19 September 2012

Graph 5236/G1



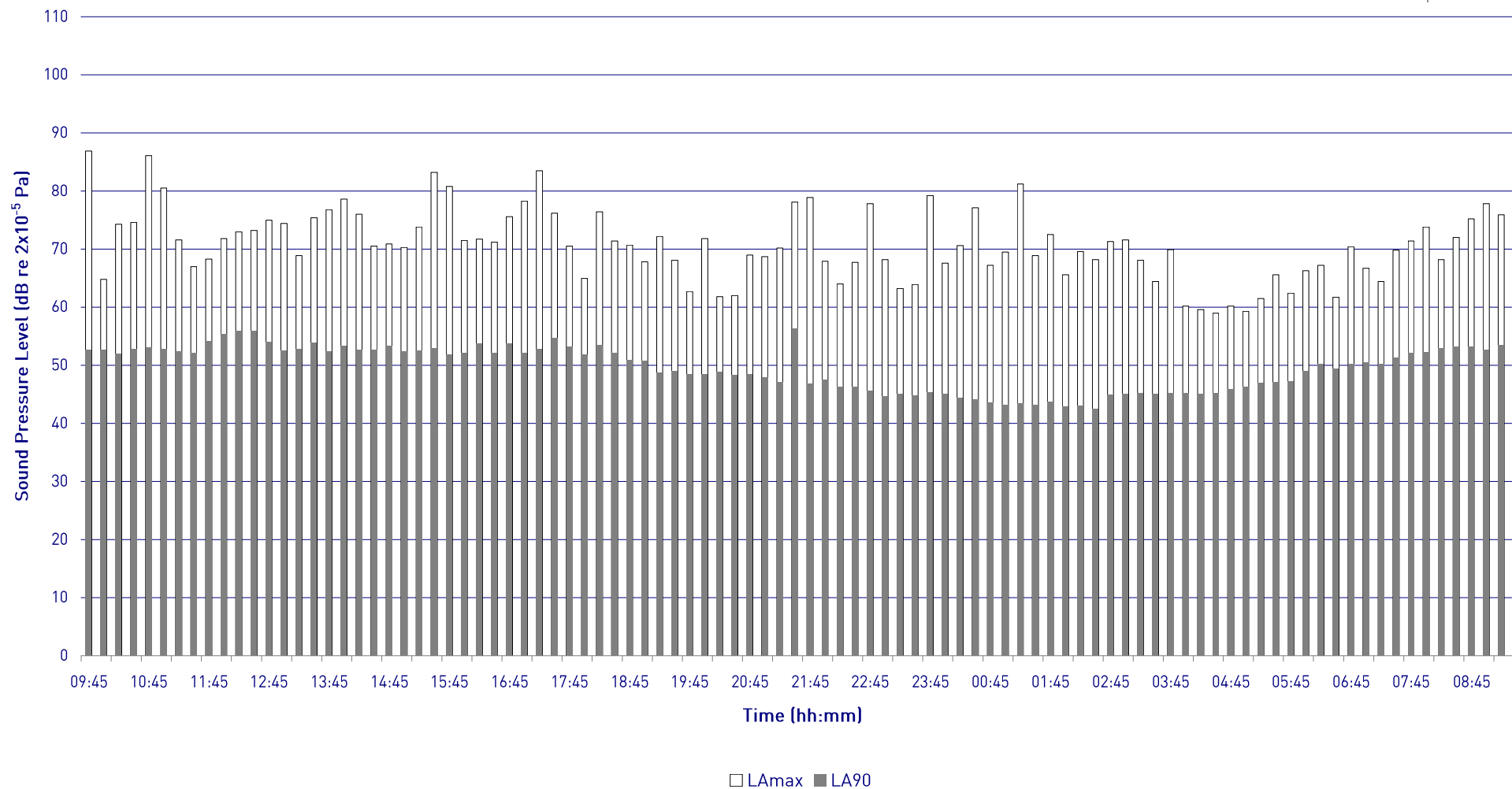
81 Chancery Lane, London

L_{A90} and L_{Amax} Time History

Tuesday 18 September to Wednesday 19 September 2012



Graph 5236/G2



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