RBA ACOUSTICS

40-42 PARKER STREET LONDON WC2B

Plant Noise Assessment

REPORT 6062/PNA
Prepared: 25 February 2014
Revision Number: 0

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Revision	Comment	Date	Prepared By	Approved By
0	First issue of report	25 February 2014	David Smitten	Russell Richardson

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1.0 INTRODUCTION

In order to complete the planning application for the location of new mechanical services plant at 40-42 Parker Street, London WC2B, Camden Council requires consideration be given to atmospheric noise emissions from the proposed equipment at the nearest noise-sensitive property.

RBA Acoustics have been commissioned to undertake measurements of the prevailing noise conditions at the site and to determine the atmospheric noise emissions in accordance with Camden Council'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

Monitoring of the prevailing background noise levels was undertaken between Friday 24 January and Tuesday 28 January 2014

During the survey period the weather conditions were generally appropriate for the noise measurement exercise, it being predominately dry with light winds.

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

Rear of 40-42 Parker Street

Measurements were undertaken with the microphone positioned 1m outside a 3rd floor window to the rear of 40-42 Parker Street. This measurement position was considered as being representative of the noise climate as experienced at the closest noise-sensitive receptors to the proposed plant to the rear of the property.

The measurement position is also illustrated on the attached Site Plan 6062/SP1.

2.3 Instrumentation

The following equipment was used for the measurements:

Table 6062/T1 – Equipment Details

Manufacturer	Model Type	Serial No.	Calibration	
			Certificate No.	Expiry Date
Larson Davis Type 1 Sound Level Meter	SLM824	4307	2012-160400	13 June 2014
Larson Davis Pre Amplifier	PRM902	5029	2012-160197	5 June 2014
Larson Davis ½" Microphone	377B02	LW131167	1862.01	2 July 2014
Larson Davis Calibrator	Cal 200	3321	U11516	27 June 2014

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

3.0 RESULTS

The noise levels at the measurement positions are shown as time-histories on the attached Graphs 6062/G1-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 6062/T2 – Measured Levels

Measurement Period	Rear of 40-42 Parker Street	
	L_{90} (dBA)	L_{eq} (dBA)
Daytime (07:00 – 19:00)	49.5	57.0
Evening (19:00 – 23:00)	50.1	57.3
Night-Time (23:00 – 07:00)	48.3	51.9

4.0 CRITERIA

The requirements of the London Borough of Camden for noise levels from new plant and machinery are detailed in Development Policy 28 (DP28) of their Core Strategies document. These requirements are repeated below.

Table 6062/T3 – London Borough of Camden Plant Noise Criteria

Noise Description and Location of Measurement	Period	Time	Noise Level
Noise at 1 metre external to a sensitive facade	Day, evening and night	00:00 - 24:00	5dB < 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 < 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 < L_{A90}
Noise at 1 metre external to sensitive façade where L_{A90} > 60dB	Day, evening and night	00:00 - 24:00	55dB L_{Aeq}

Analysis of the manufacturer's data for the proposed units reveals there are no tonal characteristics.

Based upon the above, the following noise emission limits at the nearest noise-sensitive windows to the rear of 40-42 Parker Street would be appropriate:

- Daytime (07:00 - 19:00) 45 dB
- Evening (19:00 - 23:00) 45 dB
- Night-Time (23.00 - 07.00) 43 dB

5.0 ASSESSMENT

Our assessment has been based upon the following information:

5.1 Proposed Air Conditioning Units

3 No. Mitsubishi PUMY-P100-140VHMB/YHMB Compressors

5.2 Position of Units

The equipment is generally to be located on terraces at the rear façade of the property, on the fourth and fifth floors. The equipment positions are indicated on the attached Site Plan 6062/SP1.

5.3 Noise Levels

Information regarding the noise levels of the proposed plant has been provided by the manufacturer of the units. The octave band sound pressure levels of the unit (at 1m) are detailed as follows:

Table 6062/T4 – Manufacturer's Noise Levels

Unit	Parameter	Sound Level (dB) at Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Mitsubishi PUMY-P100	Lp at 1m	58	53	50	49	46	41	35	38

Review of the octave band data concludes that there are no tonal characteristics associated with the proposed plant.

5.4 Location of Nearest Noise-Sensitive Windows

The closest noise-sensitive windows to the plant are advised as being those belonging to offices adjacent to the rear of 40-42 Parker Street. These windows are show in the attached Photograph 6062/P1.

5.5 Calculation of Noise Levels at Nearest Noise-Sensitive Windows

Our calculation method for predicting noise levels from the proposed air conditioning units at the nearest noise sensitive windows, based on the information stated above, is summarised below.

- Source Term SPL (Cumulative)
- 20LogR Distance Attenuation
- Barrier Attenuation
- Reflections

Calculation sheets are attached for further information in Appendix B.

The results of the calculations indicate the following noise levels at the nearest affected noise-sensitive windows:

Table 6062/T5 – Measured Levels

Operating Period	Rear of 40-42 Parker Street	
	Prediction (dBA)	Criterion (dBA)
Daytime (07:00 – 19:00)	37.3	45
Evening (19:00 - 23:00)	37.3	45
Night-Time (23:00 – 07:00)	37.3	43

5.6 Mitigation

Noise from the proposed units to the rear of the property is within the target criteria. Hence, no additional noise mitigation is required.

6.0 VIBRATION CONTROL

In addition to the control of airborne noise transfer, it is also important to consider the transfer of noise as vibration to adjacent properties (as well as to any sensitive areas of the same building).

We would typically advise that condensing units be isolated from the supporting structure by means of either steel spring isolators or rubber footings. For particularly sensitive locations, or when on lightweight structures, the mounts should ideally be caged and be of the restrained type.

It is important the isolation is not "short-circuited" by associated pipework or conduits. To this end, any conduits should be looped and flexible connectors should be introduced between the condenser and any associated pipework. Pipework should be supported by brackets containing neoprene inserts.

7.0 CONCLUSION

Measurements of the existing background noise levels at 40-42 Parker Street, London WC2B have been undertaken. The results of the measurements have been used in order to determine the required criteria for atmospheric noise emissions from the future plant installations.

The results of the assessment indicate atmospheric noise emissions from the plant are within the criteria required by Camden Council. As such, the proposed plant installations should be considered acceptable and planning consent should not be refused on the basis of noise impact.

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.

Appendix B – Plant calculations

Plant Unit Calculation Summary

Unit	Parameter	Sound Pressure Level (dB) at Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
1	Lp at 1m	58.0	53.0	50.0	49.0	46.0	41.0	35.0	38.0	
	Distance Loss (2.5m)	-8.0	-8.0	-8.0	-8.0	-8.0	-8.0	-8.0	-8.0	
	Screening	-6.0	-6.9	-8.3	-10.4	-13.0	-15.9	-18.9	-20.0	
	Reflections	+3.0	+3.0	+3.0	+3.0	+3.0	+3.0	+3.0	+3.0	dBA
	Total at Receiver	47.0	41.1	36.7	33.6	28.0	20.1	11.1	13.0	34.7
2	Lp at 1m	58.0	53.0	50.0	49.0	46.0	41.0	35.0	38.0	
	Distance Loss (3.7m)	-11.4	-11.4	-11.4	-11.4	-11.4	-11.4	-11.4	-11.4	
	Screening	-5.5	-5.9	-6.7	-8.1	-10.1	-12.6	-15.5	-18.5	
	Reflections	+3.0	+3.0	+3.0	+3.0	+3.0	+3.0	+3.0	+3.0	dBA
	Total at Receiver	44.1	38.7	34.9	32.6	27.6	20.0	11.2	11.2	33.6
3	Lp at 1m	58.0	53.0	50.0	49.0	46.0	41.0	35.0	38.0	
	Distance Loss (6.5m)	-16.3	-16.3	-16.3	-16.3	-16.3	-16.3	-16.3	-16.3	
	Screening	-8.7	-10.9	-13.6	-16.6	-19.6	-20.0	-20.0	-20.0	
	Reflections	+3.0	+3.0	+3.0	+3.0	+3.0	+3.0	+3.0	+3.0	dBA
	Total at Receiver	36.0	28.8	23.1	19.2	13.2	7.7	1.7	4.7	21.1

Received Noise Levels Summary

Unit Contributions	Sound Pressure Level (dB) at Octave Band Centre Frequency (Hz)								
	63	125	250	500	1k	2k	4k	8k	
Unit 1 Lp at Receiver	47.0	41.1	36.7	33.6	28.0	20.1	11.1	13.0	
Unit 2 Lp at Receiver	44.1	38.7	34.9	32.6	27.6	20.0	11.2	11.2	
Unit 3 Lp at Receiver	36.0	28.8	23.1	19.2	13.2	7.7	1.7	4.7	dBA
Total Lp at Received	49.0	43.3	39.0	36.2	30.9	23.2	14.4	15.6	37.3

KEY

- Measurement Position
- Approximate Site Boundary
- New Plant Location (At 4th and 5th Floors)

40-42 Parker Street, London WC2B

Site Plan Detailing the Measurement Position and Proposed Plant Locations

Site Plan 6062/SP1

25 February 2014

Not to Scale

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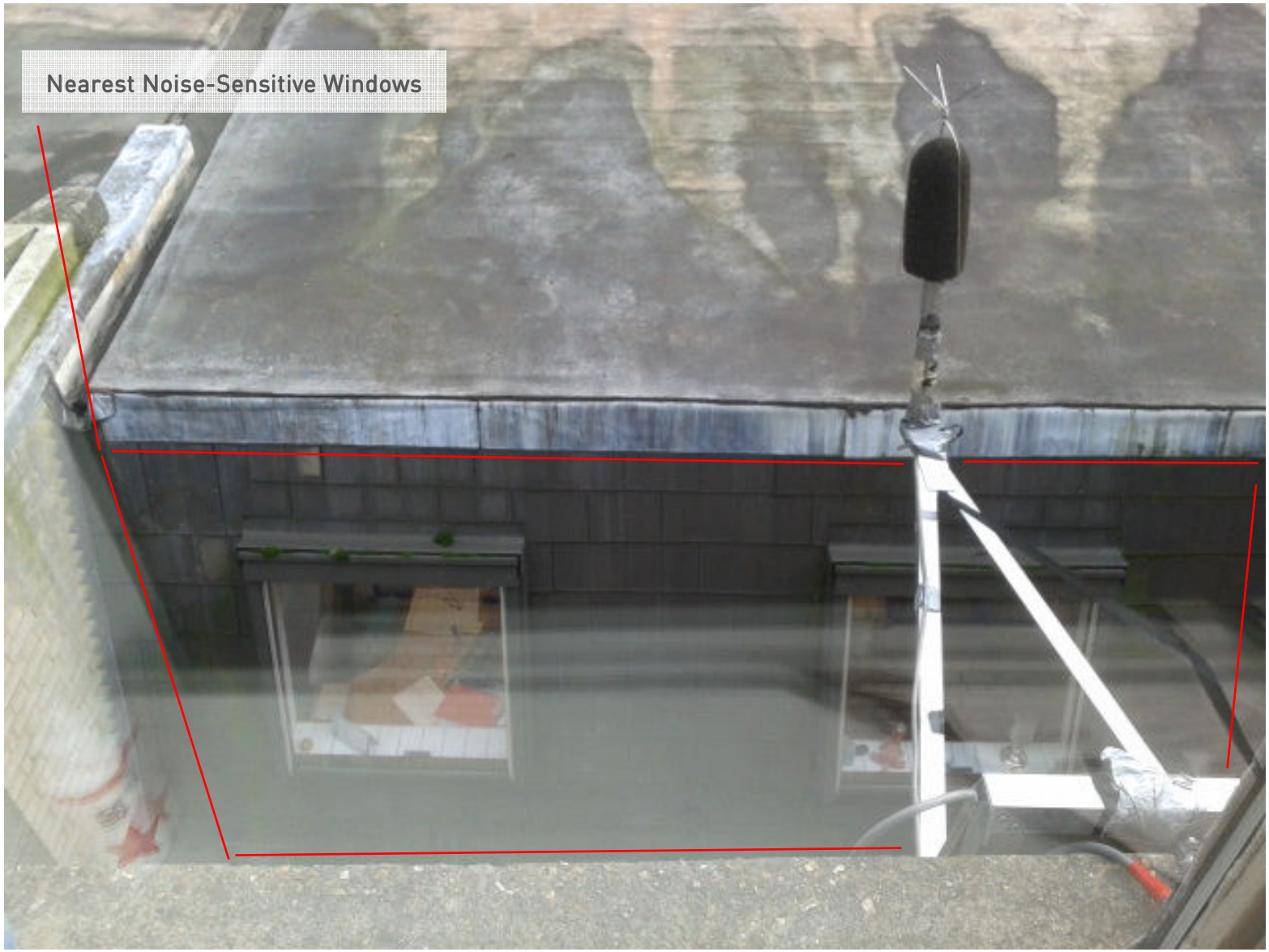

40-42 Parker Street, London WC2B

Photograph Showing the Measurement Position and

Nearest Noise-Sensitive Windows

Photograph 6062/P1

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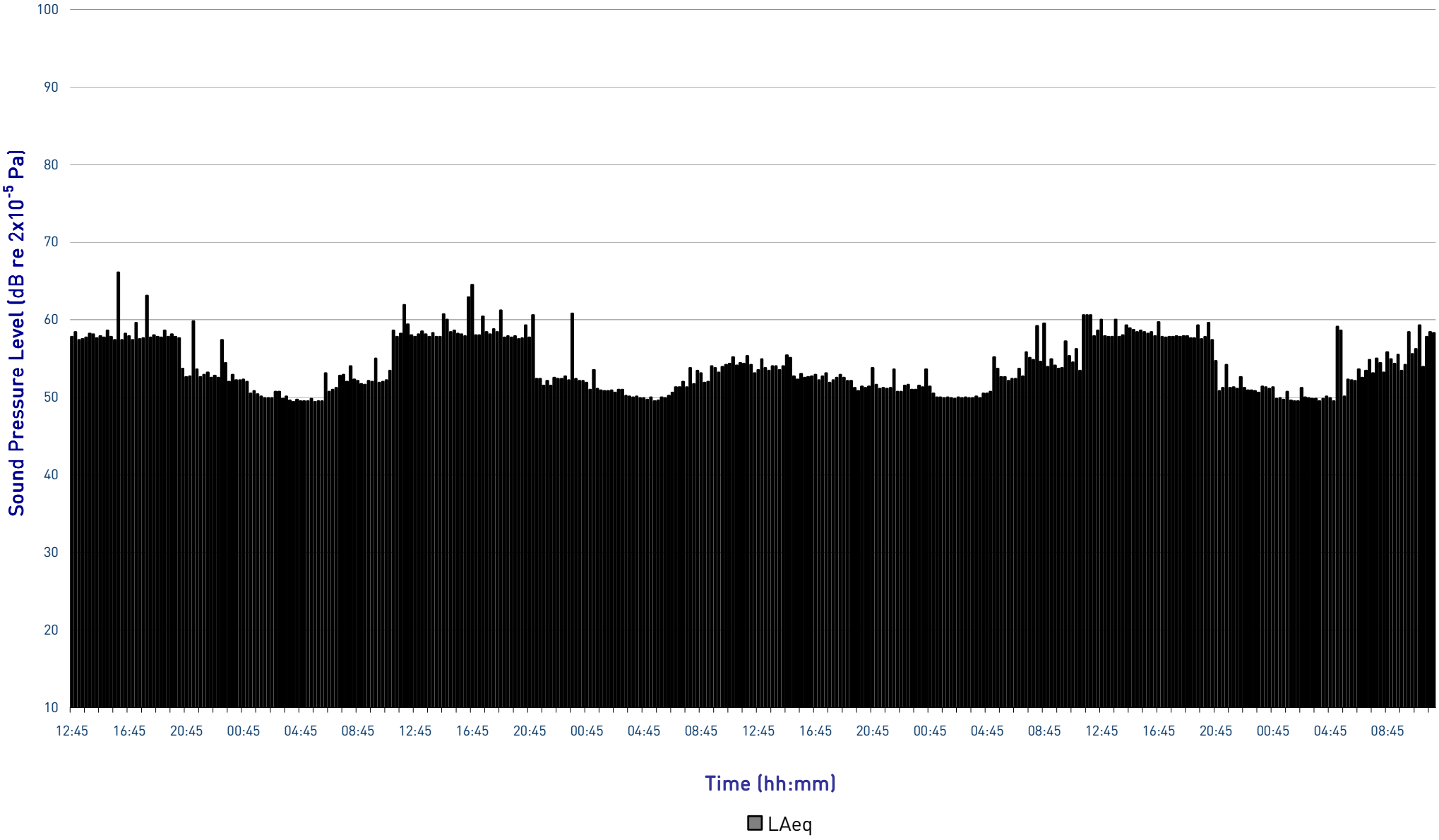
Graph 6062/G1

40-42 Parker Street
L_{Aeq} Time History
3rd Floor Rear Window, Friday 24th January 2014 to Tuesday 28th January 2014



40-42 Parker Street

L_{Amax} and L_{A90} Time History

3rd Floor Rear Window, Friday 24th January 2014 to Tuesday 28th January 2014

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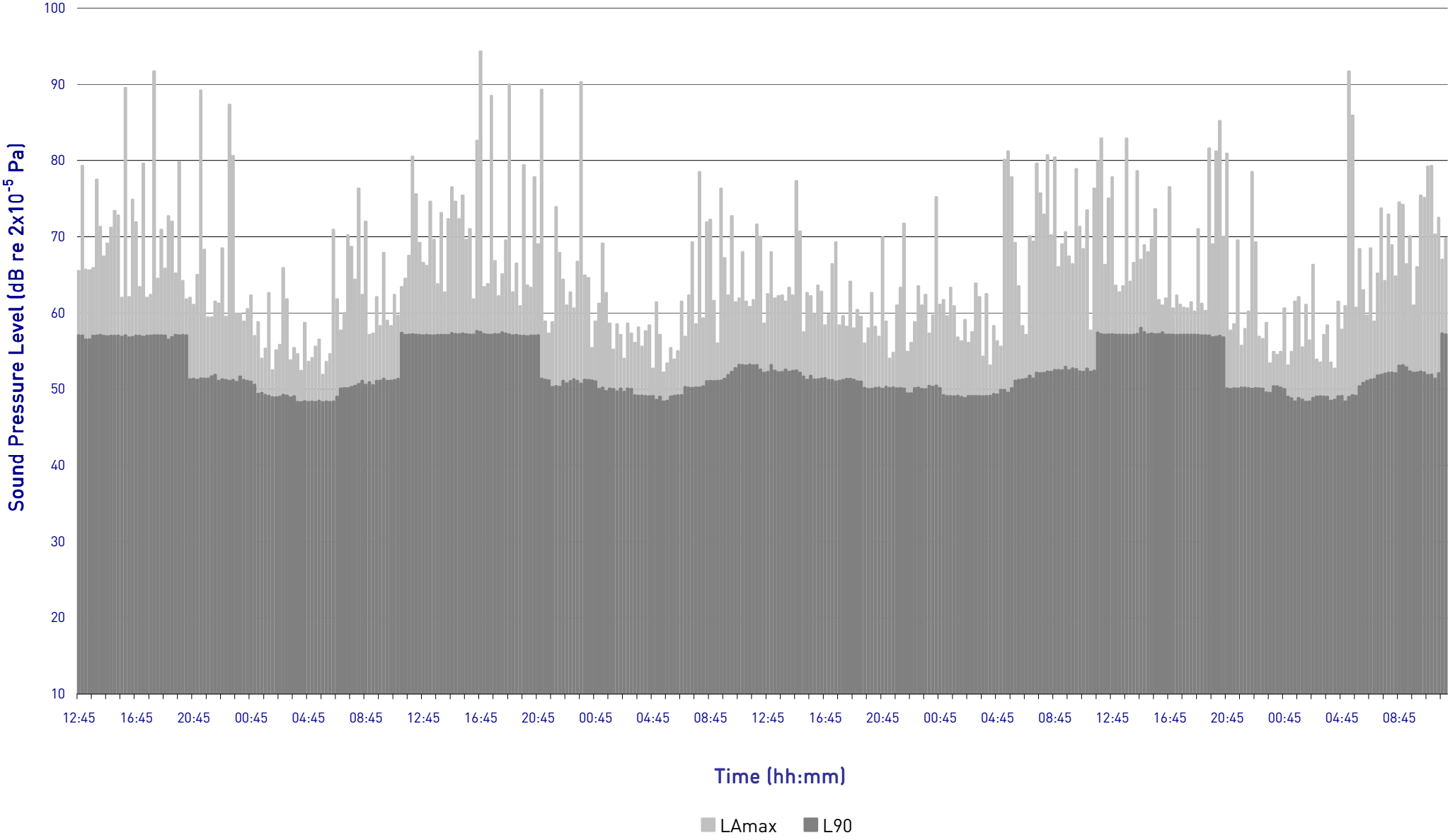
Graph 6062/G2



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