116 REGENTS PARK ROAD

Plant Noise Assessment

Reference: 14193.RP01.PNA.0
Prepared: 7 March 2025
Revision Number: 0

Architecture for London
3-5 Bleeding Heart Yard
London
EC1N 8SJ

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Revision	Comment	Date	Prepared By	Approved By
0	First issue of report	7 March 2025	Robert Gurney	James Melville

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The recommendations within this report relate to acoustics performance only and will need to be integrated within the overall design by the lead designer to incorporate all other design disciplines such as fire, structural integrity, setting-out, etc. Similarly, any sketches appended to this report illustrate acoustic principles only and will need to be developed into full working drawings by the lead designer to incorporate all other design disciplines.

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Contents

1. INTRODUCTION

It is proposed to locate new items of plant at 116 Regents Park Road, London, NW1. As part of the planning application, Camden London Borough Council (CLBC) requires consideration be given to atmospheric noise emissions from the proposed equipment to the nearest noise-sensitive receptors.

RBA Acoustics have been commissioned to undertake measurements of the prevailing noise conditions at the site and to determine the atmospheric noise emission limits in accordance with CLBC's requirements. This report presents the results of the noise measurements, associated criteria and provides the required assessment.

2. SITE DESCRIPTION

The site is located on the northern end of a row of terraced townhouses, directly east of Primrose Hill. The adjacent premises to the south are residential, with Regents Park Road immediately to the west and Rothwell Street immediately to the north. The nose climate at the site was dominated by traffic noise from Regents Park Road.

The site is shown in relation to its surroundings in the site plan in Figure 1 (Appendix E).

3. ENVIRONMENTAL NOISE SURVEY

3.1 Survey Methodology

Monitoring of the prevailing background noise was undertaken over the following period:

- 13:00 Wednesday 15 January to 13:00 Thursday 16 January 2025.

As the survey was unattended it is not possible to comment with certainty regarding meteorological conditions throughout the entire survey period. However, based on observations during the site visits and weather reports for the area, conditions were generally considered suitable for obtaining representative noise measurements, being predominantly dry with little wind.

Measurements were made of the L_{A90}, L_{Amax} and L_{Aeq} noise levels over 15-minute sample periods. A summary of acoustic terminology is included in Appendix A.

3.2 Measurement Positions

To determine the existing noise climate around the site measurements were undertaken at the following locations:

- *Measurement Position 1 – Balcony*
  The microphone was mounted on a tripod on a balcony approximately 1.5m from first floor level. The noise climate at this position was dominated by road traffic from Regents Park Road.

- *Measurement Position 2 – Rear Garden*
  The microphone was mounted on a tripod approximately in the rear garden, 1.5m from ground level and 3m from any other reflective surface. The noise climate at this position was noted to consist of road noise from Rothwell Street and general suburban noise.

The measurement positions are also illustrated on the site plan attached in Figure 1 and photos in Figure 2 (Appendix E).

3.3 Instrumentation

For information regarding the equipment used for the measurements please refer to Appendix B.

The sound level meters were calibrated both prior to and on completion of the survey with no significant calibration drifts observed.

3.4 Survey Noise Levels

The noise levels measured are shown as time-histories on the attached Graphs 1-2 (Appendix E).

Selection of an appropriately representative background sound level is discussed in BS 4142:2014 *Methods for Rating and Assessing Industrial and Commercial Sound* as follows:

> *"In practice, there is no "single" background sound level as this is a fluctuating parameter. However, the background sound level used for the assessment should be representative of the period being assessed.*
>
> *[...] A representative level should account for the range of background sound levels and should not automatically be assumed to be either the minimum or modal value."*

Graph 3 in Appendix E presents the range of background sound levels measured and, on this occasion, the 'typical-lowest' level has been chosen as representative for all periods. The 'typical-lowest' level can be determined statistically as the lowest $L_{A90,\,15mins}$ level which is exceeded for 90% of the assessment period, or alternatively termed the 10th percentile of the measured $L_{A90,\,15mins}$ levels.

The representative background L_{A90} and the period averaged L_{Aeq} noise levels measured are summarised in Table 1.

Table 1 - Measured Baseline Noise Levels

Measurement Period	Measurement Position 1 (MP1) – Balcony		Measurement Position 2 (MP2) – Rear Garden	
	Representative Background Noise Level $L_{A90,15min}$ (dB)	Period-Averaged Noise Level $L_{Aeq,T}$ (dB)	Representative Background Noise Level $L_{A90,15min}$ (dB)	Period-Averaged Noise Level $L_{Aeq,T}$ (dB)
Daytime (07:00 – 23:00)	58	64	31	51
Night-time (23:00 – 07:00)	36	56	28	44

4. PLANT NOISE CRITERIA

The requirements of CLBC's Environmental Health Department regarding new building services plant are understood to be as follows.

> *"[...] it is expected that British Standard 4142:2014 'Methods for rating and assessing industrial and commercial sound' (BS 4142) will be used. For such cases, a 'Rating Level' of 10 dB below background (15dB if tonal components are present) should be considered as the design criterion)."*

In line with the above requirements, we would propose items of mechanical services be designed so that noise emissions from the plant do not exceed the following levels when assessed at the nearest noise sensitive location:

Table 2 – Plant Noise Limits at NSR

Assessment Period	Plant Noise Criteria to be achieved at 1m outside the window of the nearest Noise-Sensitive Receptor (NSR), L_{Aeq} (dB)
	NSR – 114 Regents Park Road (rear)
Daytime (07:00 – 23:00)	21
Night-time (23:00 – 07:00)	18

It should be noted that the above requirements are applied at the nearest residential adjacencies and alternative criteria should be incorporated if there are also commercial properties affected by the proposed plant installations.

5. PLANT NOISE ASSESSMENT

This assessment has been based on the information provided to RBA by Architecture for London and is described in the following sections.

5.1 Proposed Plant Items

The following plant is proposed for the scheme:

Table 3 – Proposed Plant Items

Ref.	Manufacturer/Model/Duty	Plant Type
ASHP1	Vaillant aroTHERM plus 12kW	Air Source Heat Pump

5.2 Plant Locations

The ASHP unit is to be located on the southern boundary of the rear garden.

The equipment positions are indicated on the site plan in Figure 1 in Appendix E.

5.3 Plant Noise Levels

Information regarding the noise levels of the proposed plant has been provided by the manufacturer of the unit. It should be noted that only an overall dBA value was provided as octave band noise data was not available. To counter this a typical ASHP octave band spectrum has been scaled to provide the same overall dBA level.

The assumed plant noise levels are detailed as follows:

Table 4 – Plant Noise Levels

Unit	Parameter	Sound Level (dB) at Octave Band Centre Frequency (Hz)								dBA
		63	125	250	500	1k	2k	4k	8k	
ASHP1	L_P at 1m	55	56	54	51	46	40	37	30	**52**

Review of the octave band data provides no indication of any tonal characteristics associated with the proposed plant.

5.4 Noise-Sensitive Receptors (NSR)

Based on observations made on site and discussions with the design team we understand the nearest noise-sensitive receptors to the proposed plant to be as follows:

- *NSR1 – 114 Regents Park Road (rear)*
  This receptor is the adjacent property to the south of the site, located approximately 8m from ASHP1. It should be noted that 1 Rothwell Street is closer to ASHP1, however, as there are no windows facing the plant this has not been considered noise sensitive.

The receptor is shown in the site plan in Figure 1 in Appendix E.

5.5 Mitigation

It is RBA Acoustics understanding that a louvred acoustic enclosure with the following insertion losses is proposed:

Table 5 – Acoustic Enclosure Insertion Loss

System	Insertion Loss (dB) at Octave Band Centre Frequency (Hz)						
	63	125	250	500	1k	2k	4k
Emtec LAAC 15-105 Louvre	15	20	25	32	38	45	47

5.6 Predicted Noise Levels at NSR with Mitigation

Our calculation method for predicting noise levels from the proposed external plant at the nearest noise-sensitive receptors, based on the information above, is summarised below.

- Source Term SPL
- Mitigation
- Distance Attenuation
- Directivity
- Screening

Calculation sheets are attached for further information in Appendix C.

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

Table 6 – Predicted Plant Noise Levels

Operating Period	Noise Level (dB) at NSR – 114 Regent's Park Road	
	Prediction	Criterion
Daytime (07:00 – 23:00)	16	31
Night-time (23:00 – 07:00)	16	18

Noise from the proposed plant installations, with the mitigation measures in place, is within CLBC's requirements.

6. 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 ASHPs 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. CONCLUSION

RBA Acoustics have undertaken noise monitoring at 116 Regents Park Road, London, NW1. The measured noise levels are presented within this report. The resultant noise levels have been used to determine the required criteria for atmospheric noise emissions from the proposed plant installations.

- An acoustic enclosure has been selected, the insertion losses are outlined in Table 5.

Provided the above mitigation measures are included in the design and installation, the results of the assessment indicate atmospheric noise emissions from the proposed plant are within the criteria required by CLBC and, as such, can be considered acceptable in terms of noise.

Appendix A - Acoustic Terminology

A-weighting (e.g. dB(A))	A correction applied across the frequency bands to take into account the response of the human ear, and therefore considered to be more representative of the sound levels people hear.
DeciBel (dB)	Unit used for many different acoustic parameters. It is the logarithmic ratio of the level being assessed to a standard reference level.
L_{eq}	The level of a notional steady sound which, over a stated period of time, *T*, would have the same acoustic energy as the fluctuating noise measured over that period. Typically used to represent the average or ambient noise level.
$L_{Aeq,T}$	The A-weighted level of a notional steady sound which, over a stated period of time, *T*, would have the same acoustic energy as the fluctuating noise measured over that period. Typically used to represent the average or ambient noise level.
L_{An} (e.g. L_{A10}, L_{A90})	The sound level exceeded for n% of the time. E.g. L_{A10} is the A-weighted level exceeded for 10% of the time and as such can be used to represent a typical maximum level. Similarly, L_{A90} is the level exceeded for 90% of the measurement period, and is often used to describe the underlying background noise.
NR	Noise Rating – A single figure term to describe a measured noise level which considers the frequency content of the noise, generally used for internal noise level measurements (particularly mechanical services plant).

Appendix B - Instrumentation

The following equipment was used for the acoustic measurements.

Table B1 - Equipment Calibration Details

Manufacturer	Model Type	Serial No.	Calibration	
			Certificate No.	Valid Until
Norsonic Type 1 Sound Level Meter	Nor140	1407793	UCRT24/1377	5 March 2026
Norsonic Pre Amplifier	1209	23228		
Norsonic ½" Microphone	1225	468954		
Norsonic Sound Calibrator	1255	125525796	UCRT24/1374	
Norsonic Type 1 Sound Level Meter	Nor140	1407794	UCRT23/2614	22 December 2025
Norsonic Pre Amplifier	1209	23229		
Norsonic ½" Microphone	1225	468970		
Norsonic Sound Calibrator	1255	125525795	UCRT23/2613	21 December 2025

Appendix C - Plant Calculations

Table C1 - Example Calculation – ASHP1 to NSR1

Parameter	Octave-band Noise Levels (dB) at Octave-band Centre Frequency (Hz)								dBA
	63	125	250	500	1000	2000	4000	8000	
L_P at 1m	55	56	54	51	46	40	37	30	**52**
Distance losses @ 8m	-18	-18	-18	-18	-18	-18	-18	-18	-
Directivity losses	-1	-2	-4	-4	-4	-4	-4	-4	-
Mitigation	-4	-4	-5	-7	-14	-16	-15	-12	-
Screening Loss	-6	-7	-8	-10	-12	-15	-18	-20	-
Noise level at receiver	27	26	20	12	0	0	0	0	**16**

Appendix D - CDM Considerations

The Likelihood (**L**) the harm will occur can be assessed by applying an indicative score (from 1 to 5) as follows:

1 – Remote (almost never)
2 – Unlikely (occurs rarely)
3 – Possible (could occur, but uncommon)
4 – Likely (recurrent but not frequent)
5 – Very likely (occurs frequently)

The Severity of harm (**S**) can be assessed by applying an indicative score (from 1 to 5) as follows:

1 – Trivial (e.g. discomfort, slight bruising, self-help recovery)
2 – Minor (e.g. small cut, abrasion, basic first aid need)
3 – Moderate (e.g. strain, sprain, incapacitation for more than 3 days)
4 – Serious (e.g. fracture, hospitalisation for more than 24 hours, incapacitation for more than 4 weeks)
5 – Fatal (single or multiple)

The rating value is obtained by multiplying the two scores and is then used to determine the course of action.

Table D1- Risk Ratings

Rating Bands (Likelihood x Severity)		
Low Risk (1 – 8)	Medium Risk (9 -12)	High Risk (15 – 25)
May be ignored but ensure controls remain effective	Continue, but implement additional reasonable practicable controls where possible	Avoidance action is required; therefore alternative design solutions must be examined. Activity must not proceed until risks are reduced to a low or medium level

The following hazards pertinent to our design input have been identified and control measures suggested:

Table D2 – Risk Assessment

Hazard	Risk Of	At Risk	Rating			Control Measures	Controlled		
			L	S	R		L	S	R
Vibration Isolators	Injury to hands	Contractors	3	3	9	Care needs to be taken during adjustment. Follow manufacturers guidance	1	3	3
Attenuators/ Acoustic Lagging	Strain of neck, limbs or back.	Contractors	3	4	12	Provide sufficient manpower/ lifting gear	1	4	4

L: Likelihood S: Severity R: Rating

Appendix E - Graphs and Site Plans

116 Regent's Park Road

L_{Aeq} Time History

Balcony - Wednesday 15 January to Thursday 16 January 2025

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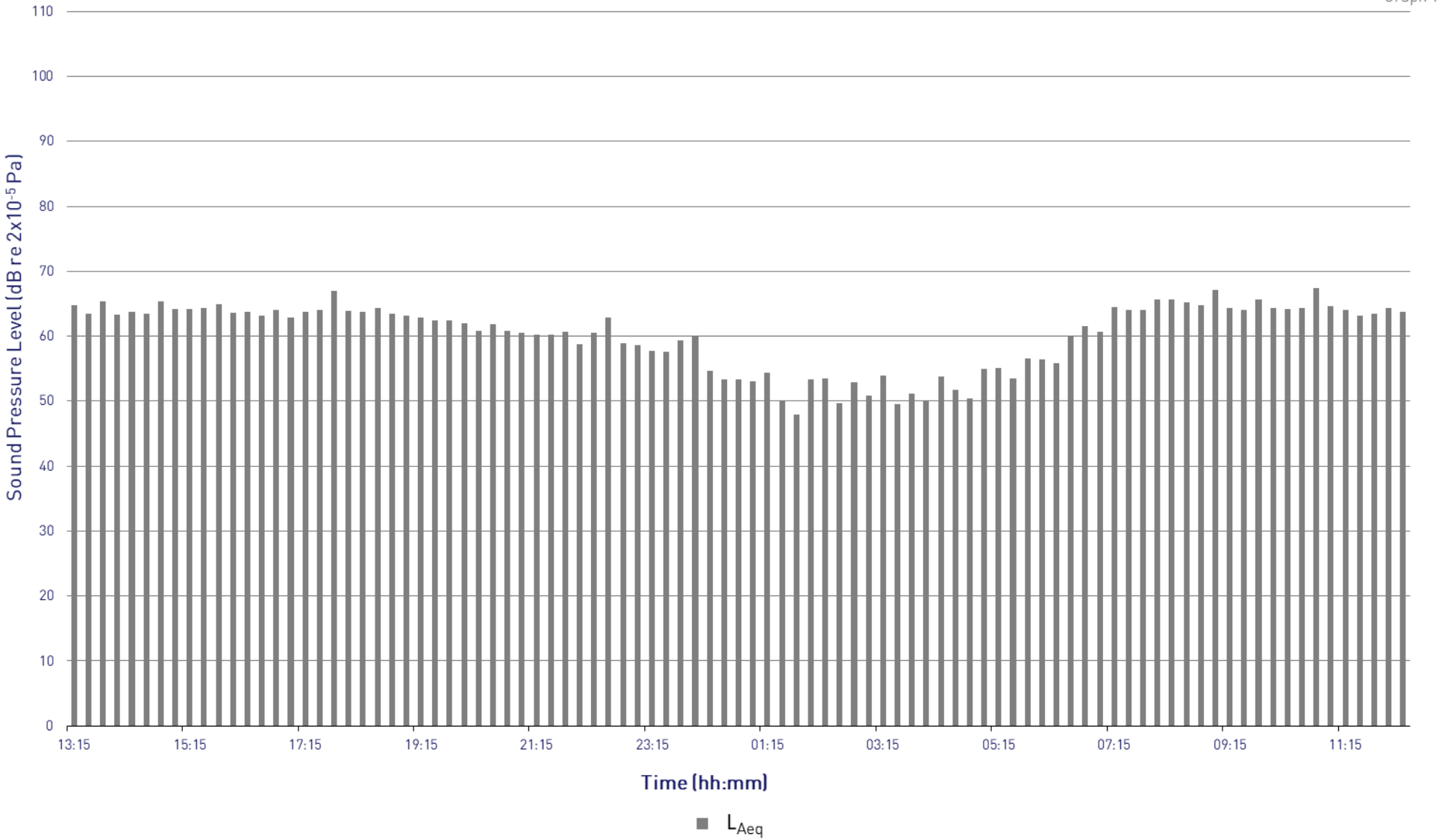
Graph 1



116 Regent's Park Road

$L_{Amax,f}$ and L_{A90} Time History

Balcony - Wednesday 15 January to Thursday 16 January 2025

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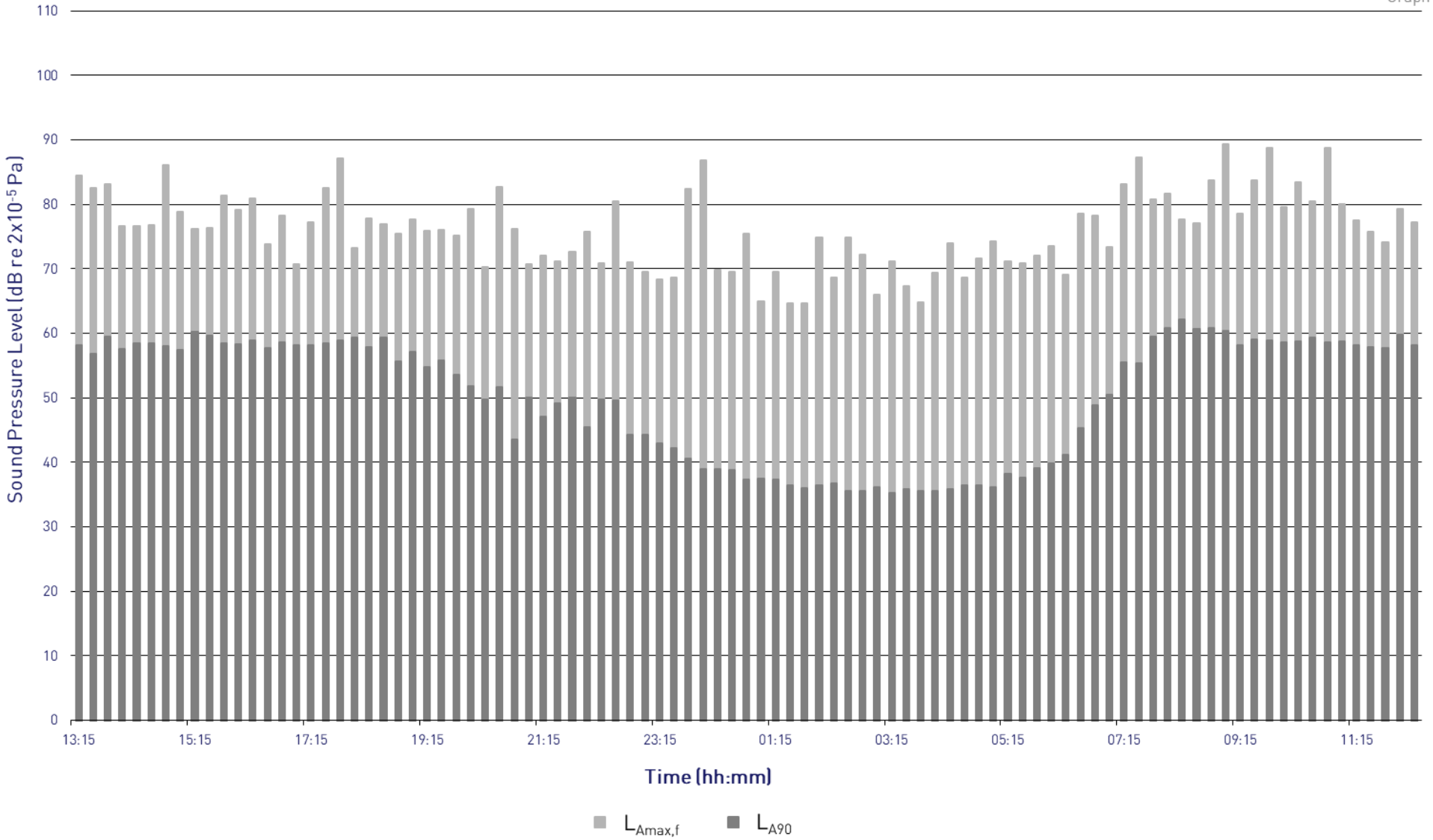
Graph 2



116 Regent's Park Road

$L_{A90,15\,minutes}$ Histogram

Balcony - Wednesday 15 January to Thursday 16 January 2025

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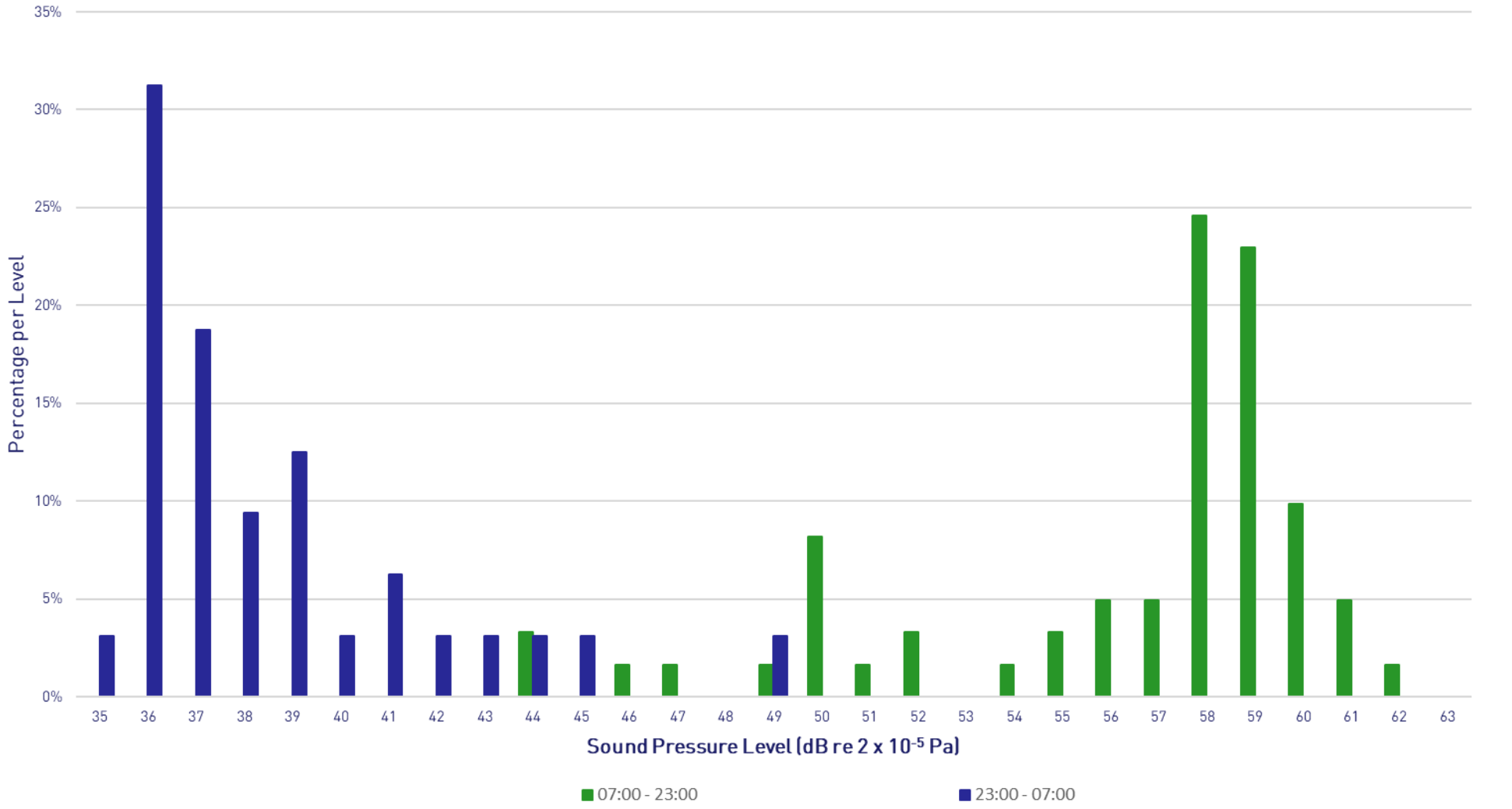
Graph 3



116 Regents Park Road

L_{Aeq} Time History

Rear Garden - Wednesday 15 to Thursday 16 January 2024

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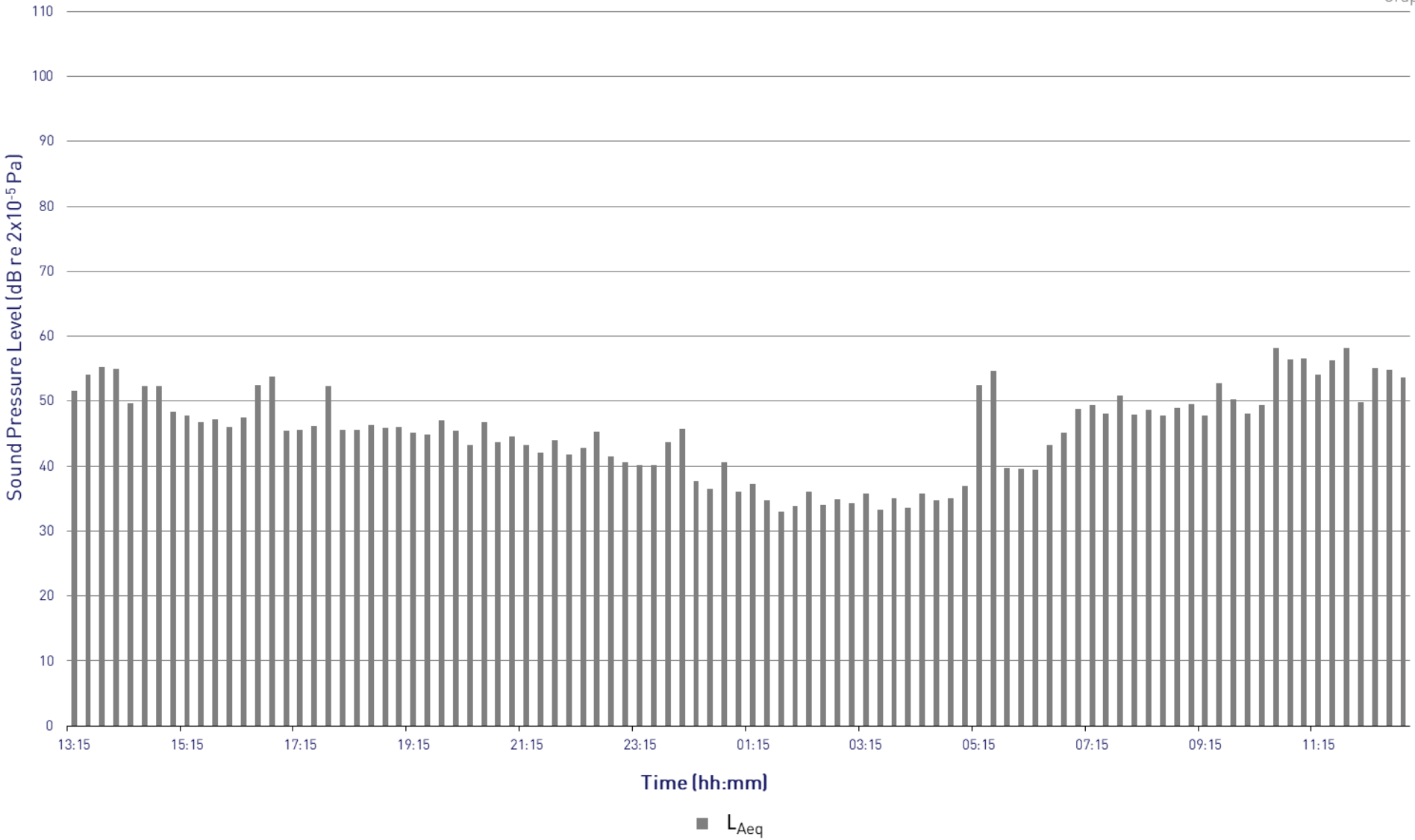
Graph 4



116 Regents Park Road

$L_{Amax,f}$ and L_{A90} Time History

Rear Garden - Wednesday 15 to Thursday 16 January 2024

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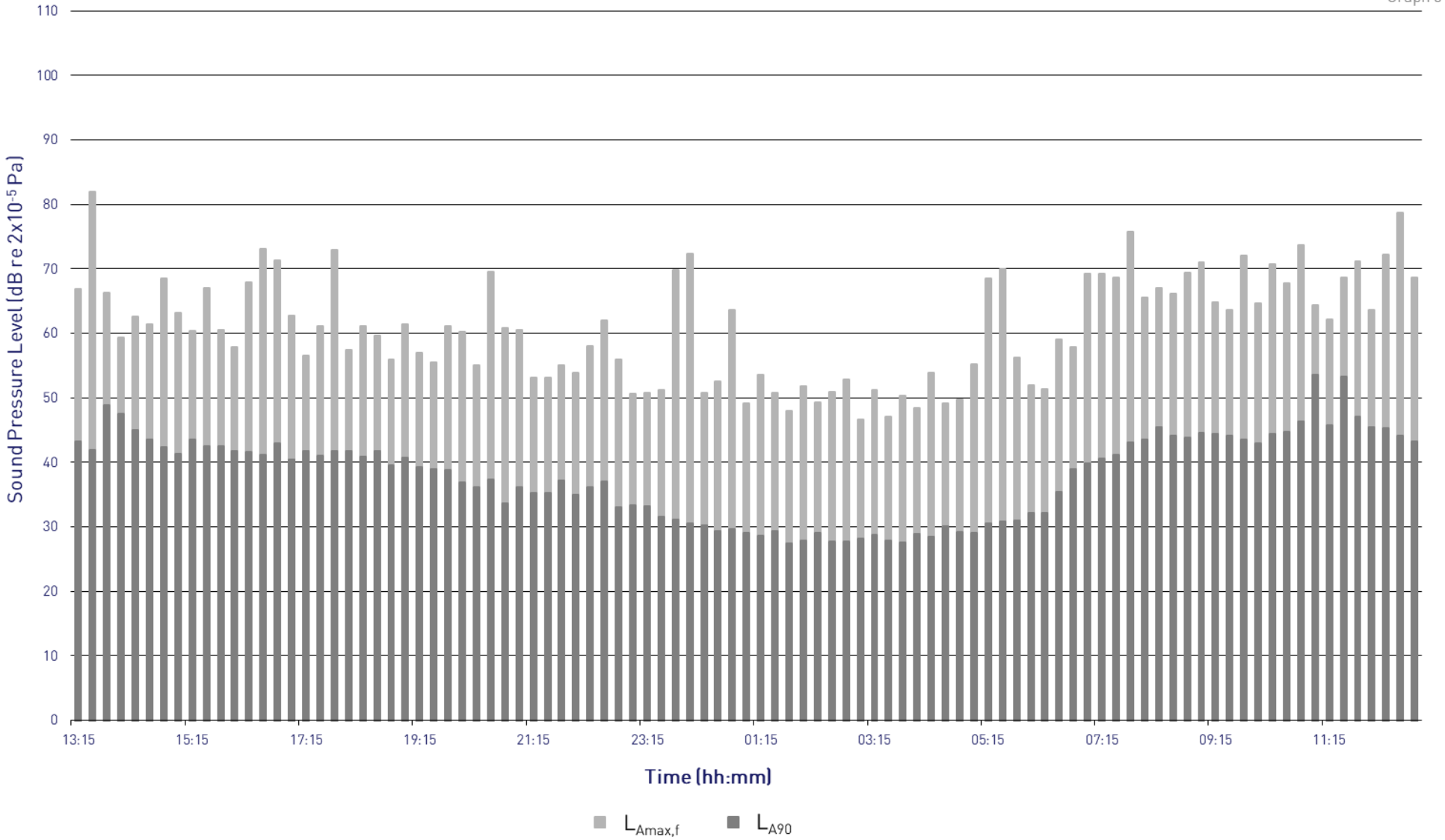
Graph 5



116 Regents Park Road

$L_{A90,15\,minutes}$ Histogram

Rear Garden - Wednesday 15 to Thursday 16 January 2024

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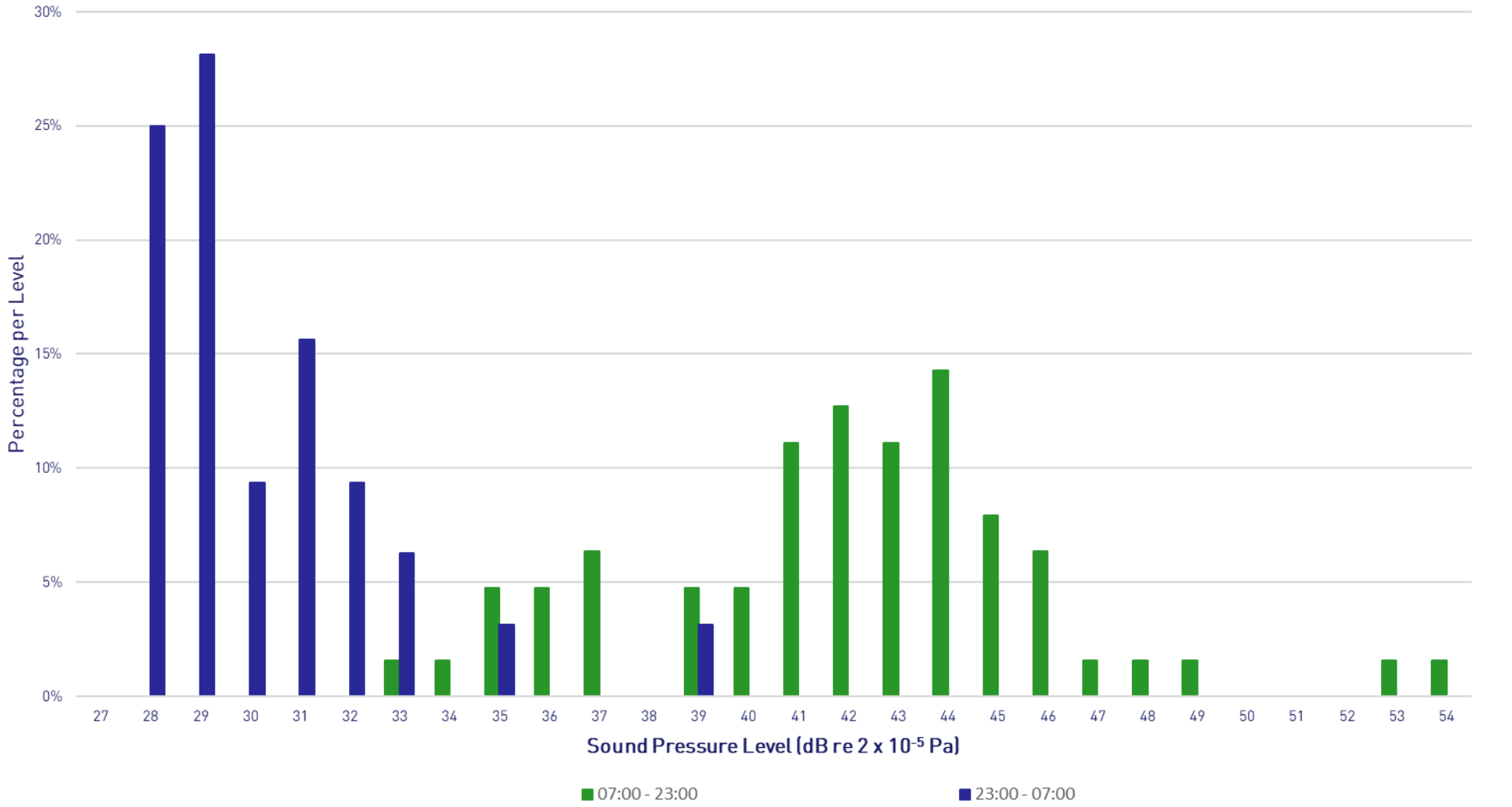
Graph 6



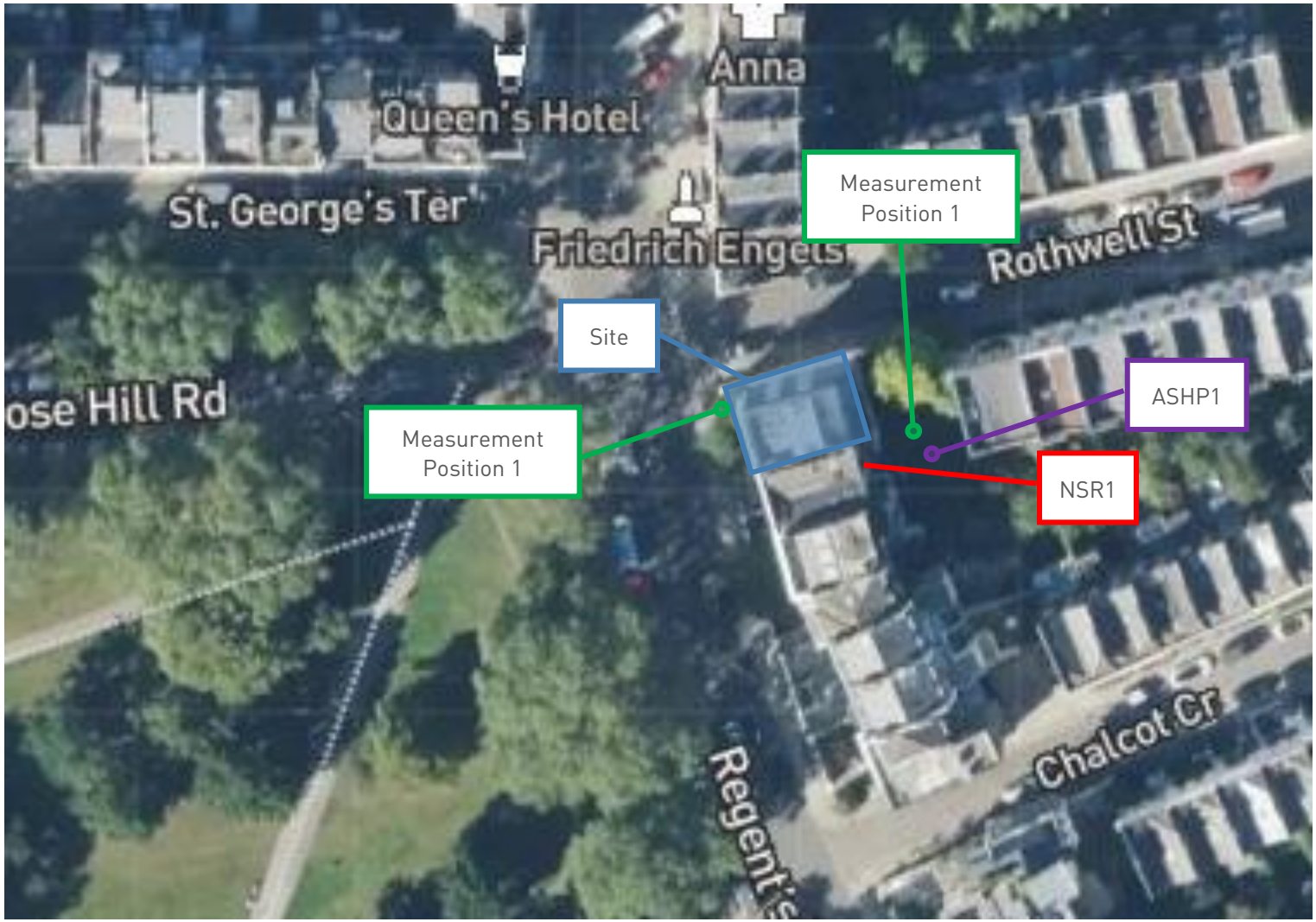


Figure 1 – Site Plan

116 Regents Park Road

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Not to Scale

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Figure 2 - Photos

116 Regents Park Road

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Not to Scale

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