KP Acoustics Ltd.
info@kpacoustics.com
1 Galena Road, W6 0LT London, UK
+44 (0) 208 222 8778
www.kpacoustics.com

11 Grange Gardens
London

Planning Compliance Report
Report 30000.PCR.01.Rev.B

Jalil Kamaruddin
11 Grange Gardens,
London
NW3 7XG

Registered in England Company No. 7947892. KP Acoustics is the Trading Name of KP Acoustics Limited

Report 30000.PCR.01.Rev.B Revision History			
First Issue Date: 04/04/2025			
A	22/04/2025 Section 5.1: Updated noise level calculations. Section 6.0: Amended	D	
B	24/04/2025 Table 2.1: Amended Section 6.0: Amended	E	
C		F	
Written by:		**Checked by:**	
Prabath Alagiyawanna Assistant Acoustic Consultant		**Gonçalo Lemos MIEnvSc MIOA** Principal Acoustic Consultant	

Disclaimer

KP Acoustics Ltd. has used reasonable skill and care to complete this technical document, within the terms of its brief and contract with the resources devoted to it by agreement with the client. We disclaim any responsibility to the client and others in respect of any matters outside the stated scope. This report is confidential to the client and we accept no responsibility to third parties to whom this report, or any part thereof, is made known. KP Acoustics Ltd. accepts no responsibility for data provided by other bodies and no legal liability arising from the use by other persons of data or opinions contained in this report.

KP Acoustics Ltd. 2025

KP acoustics

Contents

List of Attachments

1.0 INTRODUCTION

KP Acoustics Ltd has been commissioned by Jalil Kamaruddin,11 Grange Gardens, London, NW3 7XG, to undertake a noise impact assessment of an existing plant unit installation serving the building at 11 Grange Gardens, London, NW3 7XG.

A 72-hour environmental noise survey has been undertaken on site in order to prepare a noise impact assessment in accordance with BS4142:2014 '*Method for rating and assessing industrial and commercial sound'* as part of the planning requirements of The London Borough of Camden.

This report presents the methodology and results from the environmental survey, followed by calculations in accordance with BS4142 to provide an indication as to the likelihood of the noise emissions from the proposed plant unit installation having an adverse impact on the closest noise sensitive receiver. Mitigation measures will be outlined as appropriate.

2.0 SITE SURVEYS

2.1 Site Description

As shown in Figure 2.1, the site is surrounded by residential properties to all sides. The site is located on a quiet cul-de-sac (dead-end road).

Figure 2.1 Site Location Plan (Image Source: Open Street Maps)

Initial inspection of the site revealed that the background noise profile at all monitoring locations were generally quiet, with the dominant source being the traffic noise of the W Heath Road.

2.2 Environmental Noise Survey Procedure

Continuous automated monitoring was undertaken for the duration of the noise survey between 10:30 am on 14/03/2025 and 09:30 am on 14/03/2025.

The environmental noise measurement position, proposed plant installation locations, and the closest noise sensitive receiver relative to the plant installations are described within Table 2.1 and shown within Figure 2.2.

The external plant units are understood to be switched off for the duration of the unattended survey in order to establish a representative snapshot of the local background noise during the daytime and night-time.

Manual measurements were taken at each of the external plant items, 1 meter away, while operating at their expected duty.

Icon	Descriptor	Location Description
1	Noise Measurement Position 1	The microphone was installed on a tripod on the front garden area, as shown in Figure 2.2. The microphone was positioned within free-field conditions at least approx. 1.5 metres from the nearest surface.
2	Noise Measurement Position 2	The microphone was installed on a tripod on the 1st floor rear terrace area, as shown in Figure 2.2. The microphone was positioned within free-field conditions at least approx. 1.5 metres from the nearest surface.
	Nearest noise sensitive receptor 01	Front façade. Ground Floor window. Residential house No 12 to the east.
	Nearest noise sensitive receptor 02	Front façade. Ground Floor window. Residential house No 01 to the east.
	Nearest noise sensitive receptor 03	Rear façade. 1st Floor window. Residential house No 10 to the west.
	Nearest noise sensitive receptor 04	Rear façade. 1st Floor window. Residential house No 12 to the east.
	Nearest noise sensitive receptor 05	Rear façade. 1st Floor window. Residential house No 01 to the east.

Icon	Descriptor	Location Description
	Proposed plant installation location	Proposed plant installations are outlined in Section 5.1.

Table 2.1 Measurement positions and descriptions

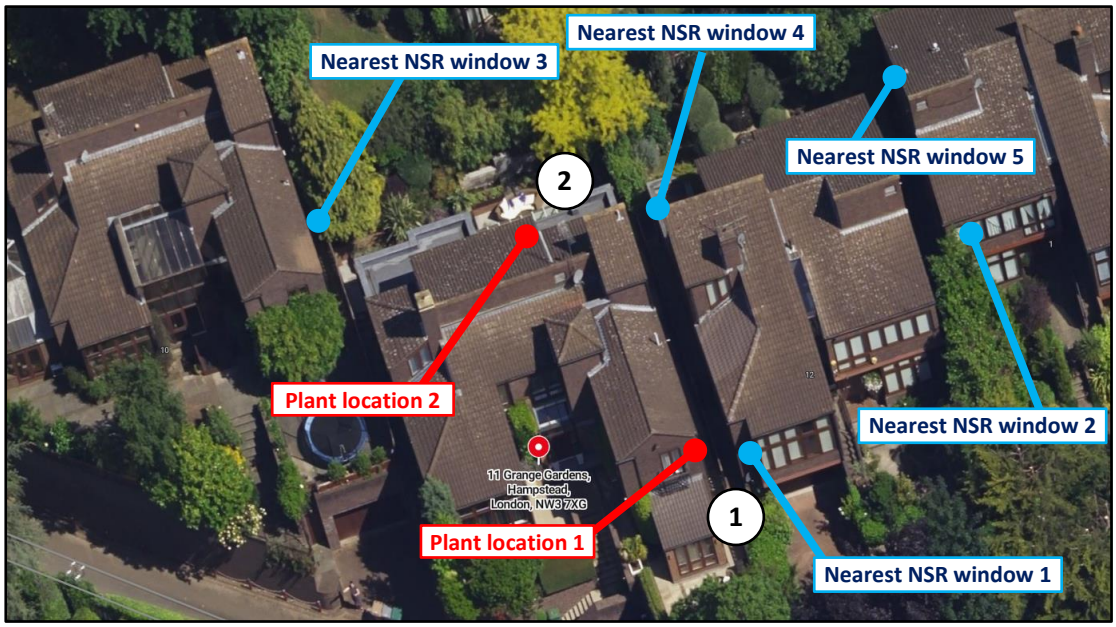

Figure 2.2 Site measurement positions (Image Source: Open Street Maps)

The choice of the position was based both on accessibility and on collecting representative noise data in relation to the nearest noise sensitive receiver and the proposed plant installation.

Weather conditions were generally dry with light winds and therefore suitable for the measurement of environmental noise. The measurement procedure complied with ISO 1996-2:2017 Acoustics '*Description, measurement and assessment of environmental noise - Part 2: Determination of environmental noise levels*'.

2.3 Equipment

The equipment calibration was verified before and after use and no abnormalities were observed. The equipment used is described within Table 2.2.

Measurement instrumentation		Serial no.	Calibration Date	Cert no.
Noise Kit 23	NTI Audio XL2 Class 1 Sound Level Meter	A2A-21143-E0	11/07/2024	TCRT24/ 1526
	Free-field microphone NTI Acoustics MC230A	A23539		
	Preamp NTI Acoustics MA220	11025		
	NTI Audio External Weatherproof Shroud	-	-	-
Noise Kit 31	NTI Audio XL2 Class 1 Sound Level Meter	A2A-21119-E0	07/08/2024	TCRT24/ 1629
	Free-field microphone NTI Acoustics MC230A	A23402		
	Preamp NTI Acoustics MA220	10915		
	NTI Audio External Weatherproof Shroud	-	-	-
Larson Davis CAL200 Class 1 Calibrator		17148	17/12/2024	UCRT24/2677

Table 2.2 Measurement instrumentation

3.0 RESULTS

The $L_{Aeq:\,5min}$, $L_{Amax:\,5min}$, $L_{A10:\,5min}$ and $L_{A90:\,5min}$ acoustic parameters were measured throughout the duration of the survey. Measured levels are shown as a time history in Figure 30000.TH1-2.

Representative background noise levels are shown in Table 3.1 for daytime and night-time.

It should be noted that the representative background noise level has been derived based on the guidance of BS4142 Section 8.1.4 from the $L_{A90,5min}$ levels measured during the environmental noise survey undertaken on site, as shown in 30000.Daytime L90.TH1-2 and 30000.Night-time L90.TH1-2 attached.

Time Period	Representative background noise level L_{A90} dB(A)	
	Measurement location 01	Measurement location 02
Daytime (07:00-23:00)	43	42
Night-time (23:00-07:00)	34	36

Table 3.1 Representative background noise levels

Measured ambient noise levels are shown in Table 3.2 for daytime and night-time.

Time Period	Ambient noise level L_{Aeq} dB(A)	
	Measurement location 01	Measurement location 02
Daytime $L_{Aeq,16hour}$	49	51
Night-time $L_{Aeq,8hour}$	51	45

Table 3.2 Ambient noise level L_{Aeq} dB(A)

Further manual measurements have been undertaken to measure the noise levels for each plant unit individually. It is understood that the external plant units were running at their normal operational duty at the time of measurement. The results of these measurements are as follows:

Attended Measurement Location	Measurement Description	Measurement Period	All Plant Items Switched ON $L_{Aeq,T}$ (dB)
Plant unit 01	Taken approximately 1m from Plant 01	09.34-09:44	46
Plant unit 02	Taken approximately 1m from Plant 02	10:01-10:06	53

Table 3.3 Plant unit Attended Measurement noise level L_{Aeq} dB(A)

4.0 NOISE ASSESSMENT GUIDANCE

4.1 BS4142: 2014 '*Methods for rating and assessing industrial and commercial sound*'

British Standard BS4142:2014 '*Methods for rating and assessing industrial and commercial sound*' describes a method for rating and assessing sound of an industrial and/or commercial nature, which includes:

- Sound from industrial and manufacturing processes
- Sound from fixed installations which comprise mechanical and electrical plant and equipment
- Sound from the loading and unloading of goods and materials at industrial and/or commercial premises, and
- Sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises or processes.

This Standard compares the Rating Level due to the noise source/s under assessment for a one-hour period during the daytime (07:00 – 23:00 hours) and a fifteen-minute period during the night-time (23:00 – 07:00 hours) with the existing background noise level in terms of an L_{A90} when the noise source is not operating.

It should be noted that the Rating Level is the Specific Sound Level in question ($L_{Aeq,\ Tr}$), including any relevant acoustic feature corrections, as follows:

- **Tonality** – '*For sound ranging from not tonal to prominently tonal the Joint Nordic Method gives a correction of between 0dB and +6dB for tonality. Subjectively, this can be converted to a penalty of 2dB for a tone which is just perceptible at the noise receptor, 4dB where it is clearly perceptible, and 6dB where it is highly perceptible'*
- **Impulsivity** – '*A correction of up to +9dB can be applied for sound that is highly impulsive, considering both the rapidity of the change in sound level and the overall change in sound level. Subjectively, this can be converted to a penalty of 3dB for impulsivity which is just perceptible at the noise receptor, 6dB where it is clearly perceptible, and 9dB where it is highly perceptible'*
- **Intermittency** – '*If the intermittency is readily distinctive against the residual acoustic environment, a penalty of 3dB can be applied'*
- **Other sound characteristics** – '*Where the specific sound features characteristics that are neither tonal nor impulsive, though otherwise are readily distinctive against the residual acoustic environment, a penalty of 3dB can be applied'*

Once the Rating Level has been obtained, the representative background sound level is subtracted from the Rating Level to obtain an initial estimate of the impact, as follows:

- Typically, the greater this difference, the greater the magnitude of the impact
- A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context
- A difference of around +5 dB could be an indication of an adverse impact, depending on the context
- The lower the rating level is relative to the measured background sound level, the less likely it is that there will be an adverse impact or significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound having a low impact, depending on the context

NOTE: Adverse impacts may include but not be limited to annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact.

The initial estimate of the impact may then be modified by taking consideration of the context in which the sound occurs.

4.2 Local Authority Guidance

The guidance provided by The London Borough of Camden for noise emissions of new plant in this instance is as follows:

The noise criteria, as per the Local Plan 2017 of London Borough of Camden, British Standard 4142:2014 'Methods for rating and assessing industrial and commercial sound' should be considered as the main reference document for the assessment. The resultant 'Rating Level' would be considered as follows:

Period	**Assessment Location**	**Rating Level Acceptability Range**		
		Green: noise is considered to be at an acceptable level	**Amber:** noise is observed to have an adverse effect level, but which may be considered acceptable when assessed in the context of other merits of the development	**Red:** noise is observed to have a significant adverse effect.
Daytime (7:00-23:00)	Garden used for main amenity (free field) and Outside living or dining or Bedroom window (façade)	10dB below background	9 dB below and 5dB above background	5dB above background
Night-time (23:00-7:00)	Outside bedroom window (façade)	10dB below background and no events exceeding 57dB L_{Amax}	9db below and 5dB above background or noise events between 57dB and 88dB L_{Amax}	5dB above background and/or events exceeding 88dB L_{Amax}

Table 4.1 Camden noise criteria for plant and machinery

5.0 NOISE IMPACT ASSESSMENT

5.1 Existing Plant Installations

It is understood that the existing plant installation is comprised of the following units:

Plant unit 01

- 1 No. Daikin unit (Model unknown)

Plant unit 02

- 1 No. Daikin unit (Model unknown)

The installation locations of the existing plant units are shown in Figure 2.2 above.

Following the site visit and inspection, it should be noted that the existing unit models could not be confirmed, and the client was also unable to provide this information. Only the make of the existing plant units installed could be observed, as detailed above. Consequently, attended measurements were conducted for each unit in accordance with the procedure outlined in Section 2.2 in order to calculate the noise emissions levels of each unit whilst operating under normal duty.

The calculated noise levels for each unit are presented in Table 5.1. These levels were determined based on the plant units operating normally, with the background ambient noise level measured while the plant items were not in operation.

Plant UnitReference	Measured SPL@1m $L_{Aeq,T}$ (dBA) (Plant ON)	Measured Ambient Noise Level $L_{Aeq,T}$ (dBA) (Plant OFF)	Calculated Plant Rating SPL@1m (dBA)
Plant unit 1	50	47	46
Plant unit 2	54	47	53

Table 5.1 Calculated Plant Noise Emission Levels

Plant unit 1 is located externally on the east elevation of 11 Grange Gardens, towards the front of the property, approximately 2.5m above the ground level, overlooking the side passage and 12 Grange Gardens. It should be noted that this plant unit is out of line of site of NSR2, due to screening from the building envelope. Plant unit 1 is located approximately 2.5 metres from NSR 1, 17 metres from NSR2. It was observed that 12 Grange Gardens also has an external condenser unit installed directly opposite Plant unit 1. It is likely that 12 Grange Gardens' unit would operate at similar times as Plant Unit1.

Plant Unit2 is located externally on the northern elevation of 11 Grange Gardens, at the rear terrace of the property, approximately 1m above the ground. It should be noted that this plant unitis out of line of site of NSR3, NSR4 and NSR5 due to screening from the building envelope. Plant Unit2 is located approximately 14 metres from NSR 3, 7 metres from NSR4 and 22 metres from NSR5.

5.2 Calculations

Taking all acoustic corrections into consideration, the noise level contribution expected at the identified residential windows from the existing condenser units would be as shown in Table 5.2. Detailed calculations are shown in Appendix B.

Receiver	Cumulative Rating Level at 1m From the Closest Noise Sensitive Window	Representative Background Sound Level	Difference	Camden Council Impact Level
NSR1*	38	43	-5	Amber
NSR2	0	34	-34	Green
NSR3	8	36	-28	Green
NSR4	14	36	-22	Green
NSR5	4	36	-32	Green

Table 5.2 Predicted noise levels at the nearest noise sensitive locations

***NSR 01 refers to a living room window, and the noise criteria associated with this location are defined for daytime periods.**

The noise emissions from Plant Unit 1 at NSR 01, without the application of any mitigation measures, result in a rating level that is 5 dB below the representative background noise level. According to standard assessment criteria, this corresponds to an ‘amber’ impact, which typically indicates that the noise is of minor significance and unlikely to cause disturbance.

During the site visit, it was observed that an air conditioning (AC) unit belonging to the adjoining property is located in close proximity to Noise Measurement Location 01. The client confirmed that this unit was not in operation during the background noise level survey.

As such, the background noise levels presented in Tables 3.1 and 3.2 do not include any contribution from this neighbouring AC unit. Had this unit been operating at the time of

measurement, it is reasonable to expect that the measured background noise levels would have been higher than those reported.

Taking this into account, the cumulative rating level at 1 metre from the closest noise-sensitive window (NSR 01) is considered to be barely perceptible. The 5 dB margin below background, along with the likelihood of a higher true background level due to the non-operational adjacent AC unit, further supports this conclusion. Therefore, the noise impact is assessed as negligible, and no additional mitigation is deemed necessary at this stage.

6.0 CONCLUSION

An environmental noise survey has been undertaken at 11 Grange Gardens, London, NW3 7XG, by KP Acoustics Ltd 10.30 am on 14/03/2025 and 09.30 am on 14/03/2025. The results of the survey have enabled criteria to be set for noise emissions.

Manual measurements have been undertaken at each plant unit operating at its representative duty.

The potential impact has been assessed by comparing the calculated rating level with the representative background noise level, taking into account the environmental noise context in accordance with Local Authority requirements.

The installation of the plant units is expected to have a 'green' impact on noise levels at the nearest noise-sensitive windows, with the exception of NSR 01. At the front-facing residential windows of NSR 01 (12 Grange Gardens), the impact is predicted to be 'amber'.

It has been concluded that noise emissions from the plant units would not have an adverse impact on the nearest residential receivers. Transmission of noise to the nearest noise sensitive windows due to the effects of the plant unit installations are predicted to have a green impact. However, an amber impact is predicted at the front residential windows of NSR1 (12 Grange Gardens).

As this category typically indicates that the noise is of minor significance and unlikely to cause disturbance and considering the character of the noise source along with on-site observations—such as the neighbouring plant unit not being operational, which could result in a slightly higher background noise level—we consider the assessment reasonable and recommend no mitigation measures.

11 Grange Gardens, London, NW3 7XG - Position 1
Environmental Time History
14/03/2025 to 17/03/2025

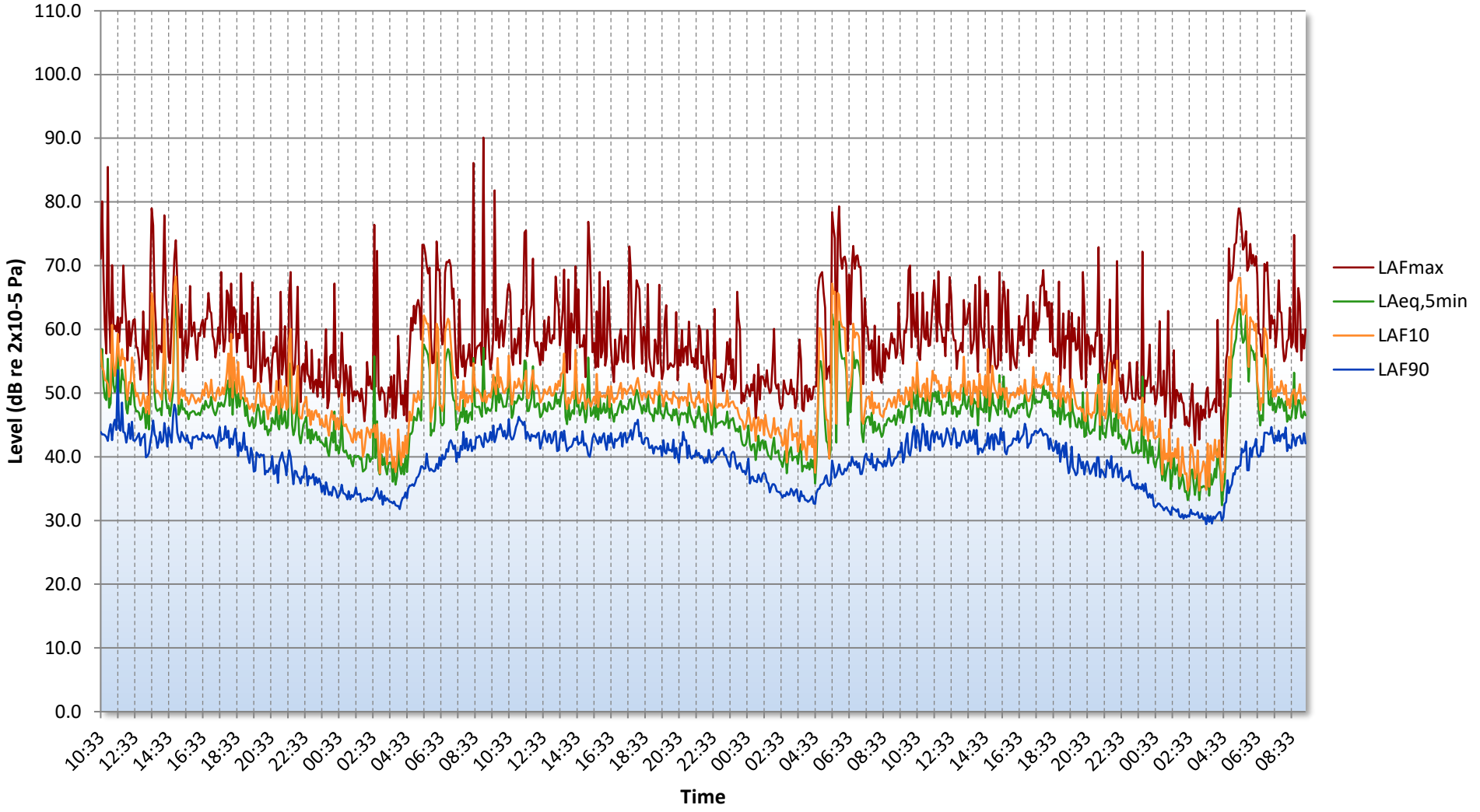

Figure 30000.TH1

11 Grange Gardens, London, NW3 7XG - Position 2
Environmental Time History
14/03/2025 to 17/03/2025

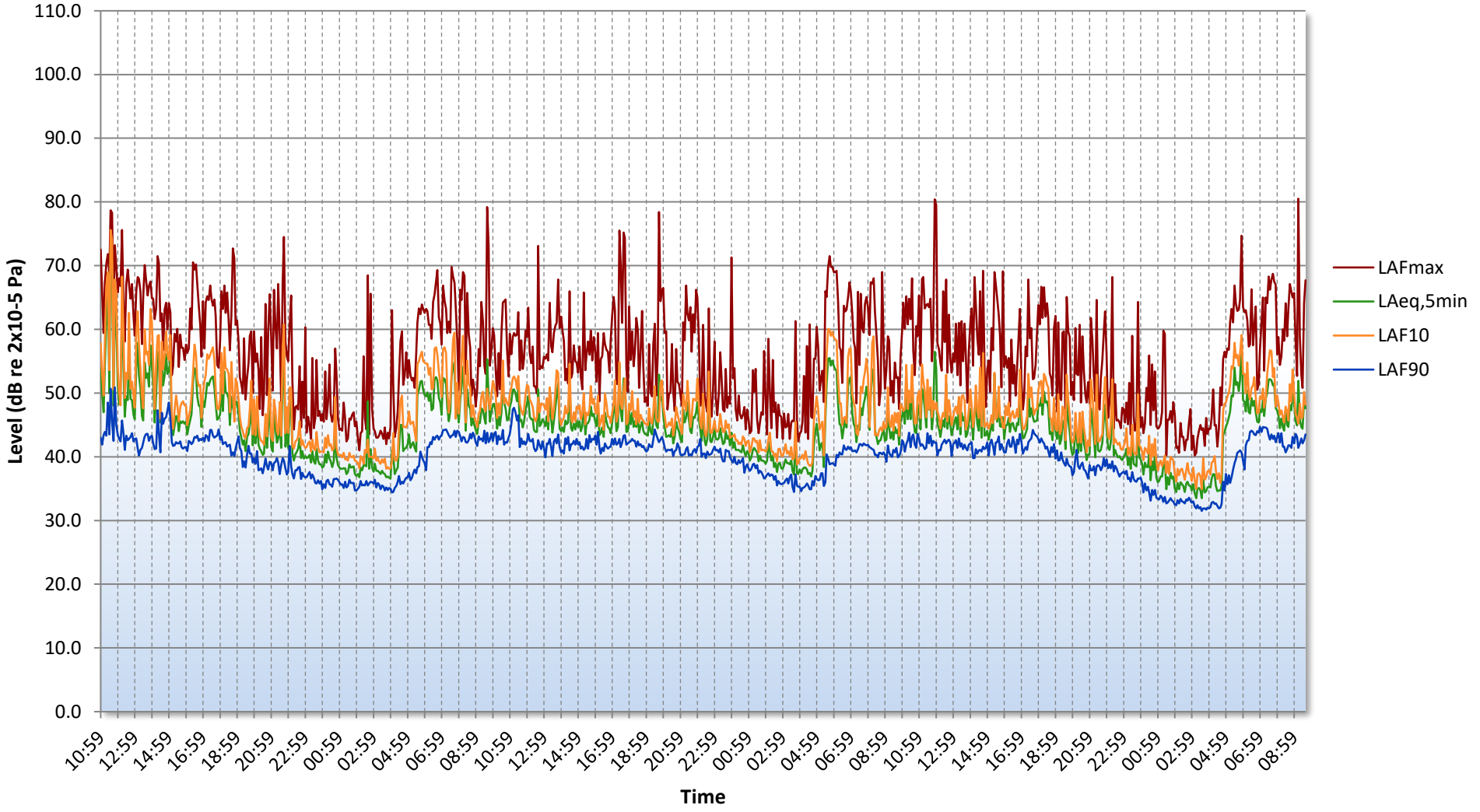

Figure 30000.TH2

11 Grange Gardens, London, NW3 7XG - Position 1
Representative Daytime Background Noise Level
14/03/2025 to 17/03/2025

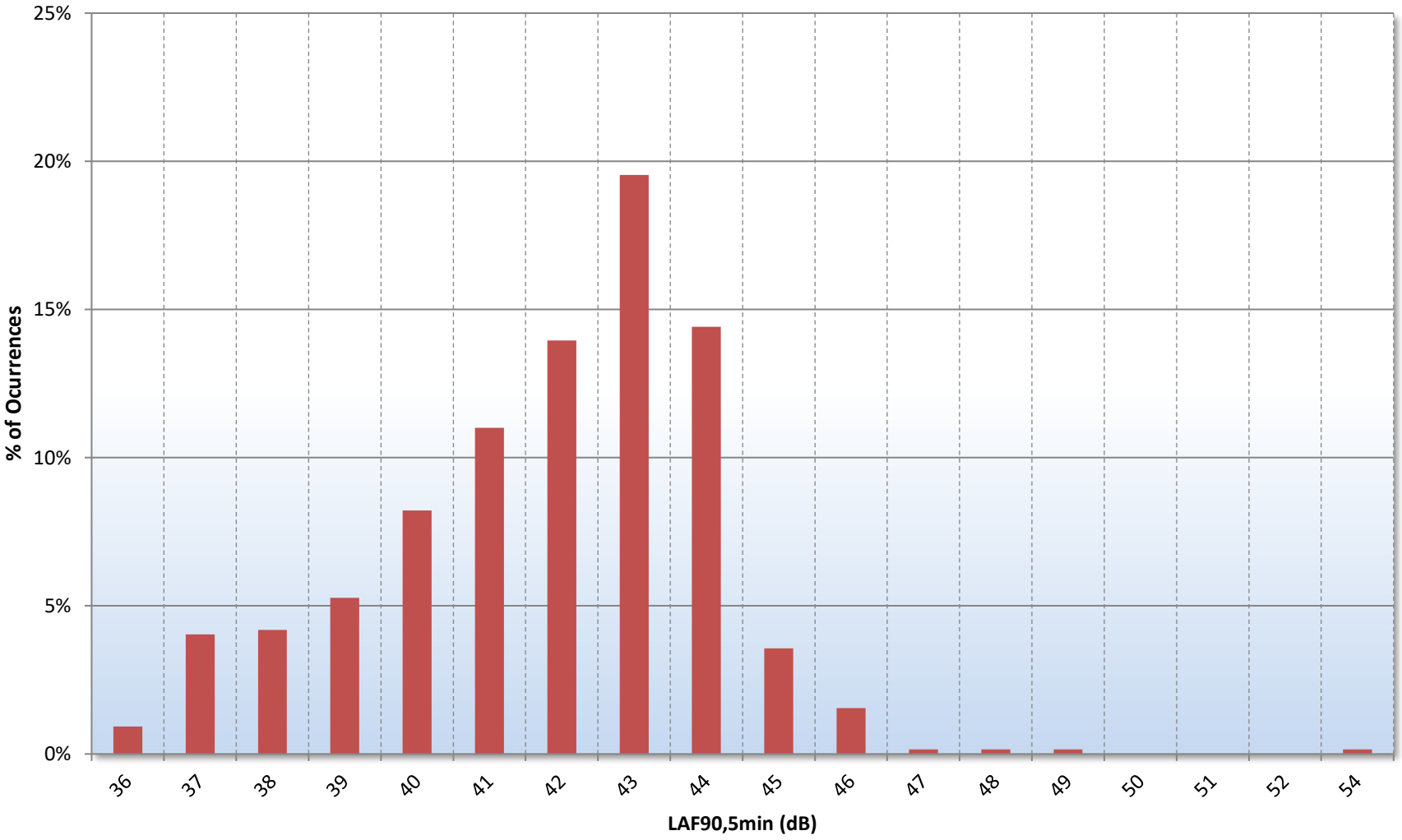

Figure 30000.Daytime L90.TH1

11 Grange Gardens, London, NW3 7XG - Position 2
Representative Daytime Background Noise Level
14/03/2025 to 17/03/2025

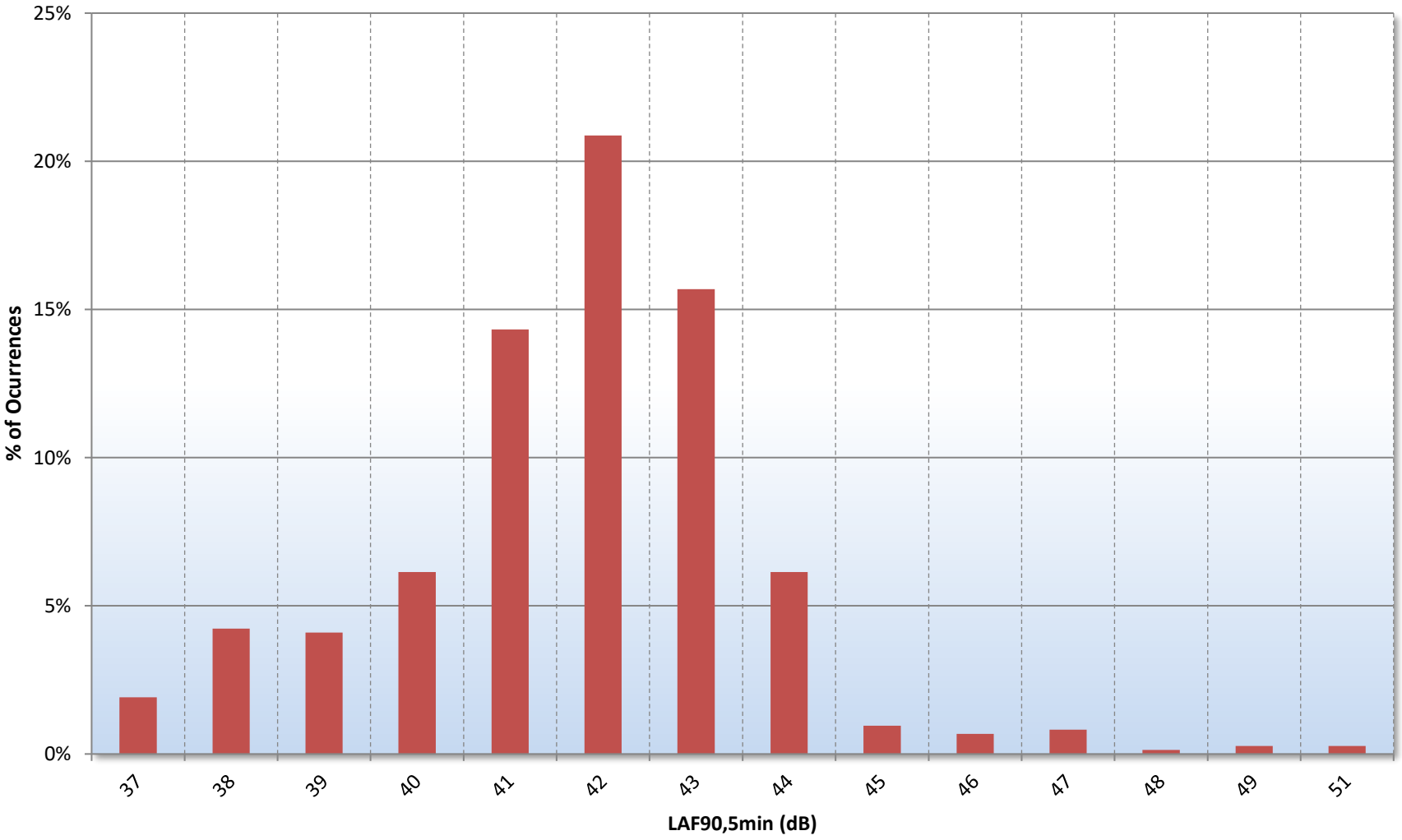

Figure 30000.Daytime L90.TH2

11 Grange Gardens, London, NW3 7XG - Position 1
Representative Night-time Background Noise Level
14/03/2025 to 17/03/2025

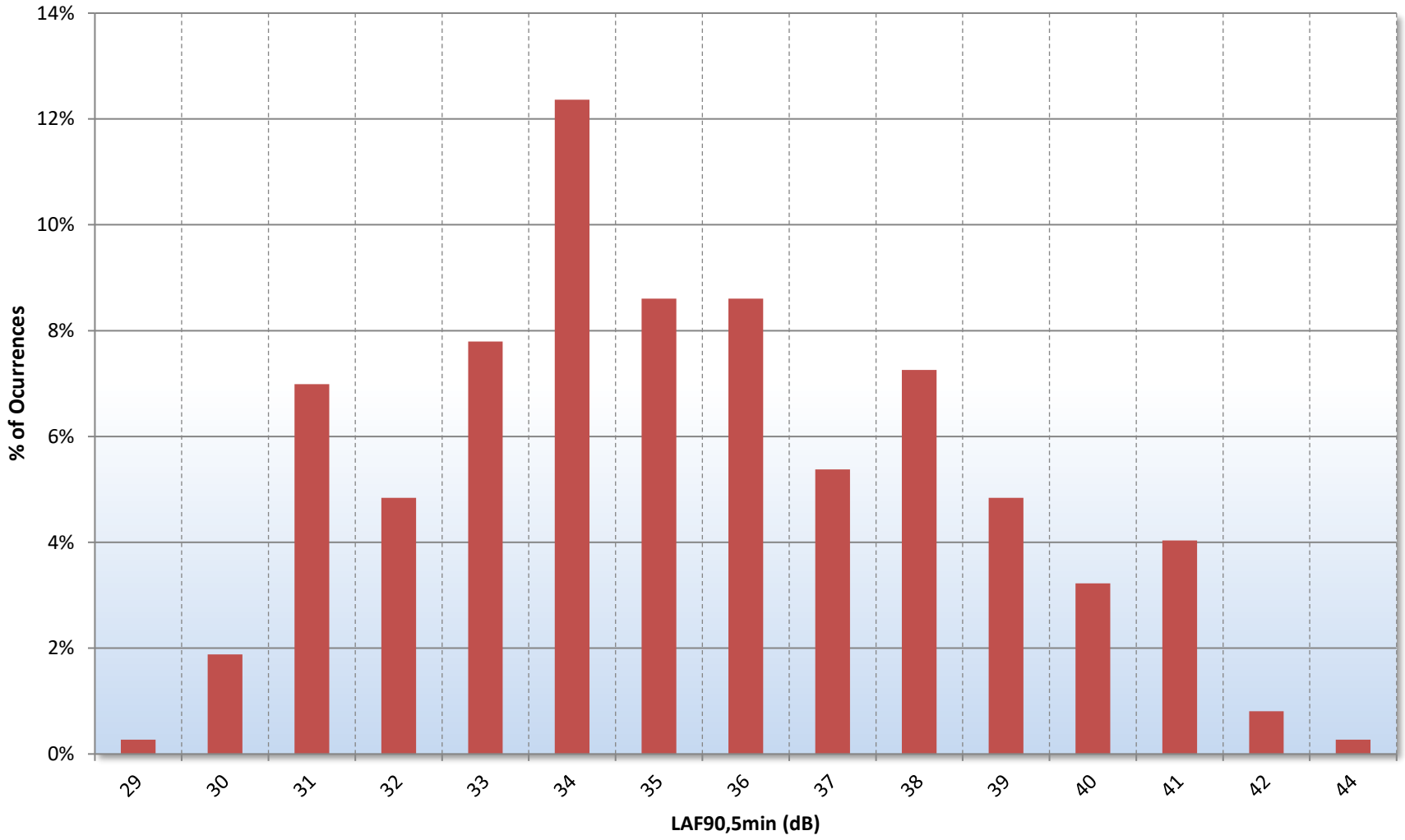

Figure 30000.Night-time L90.TH1

11 Grange Gardens, London, NW3 7XG - Position 2
Representative Night-time Background Noise Level
14/03/2025 to 17/03/2025

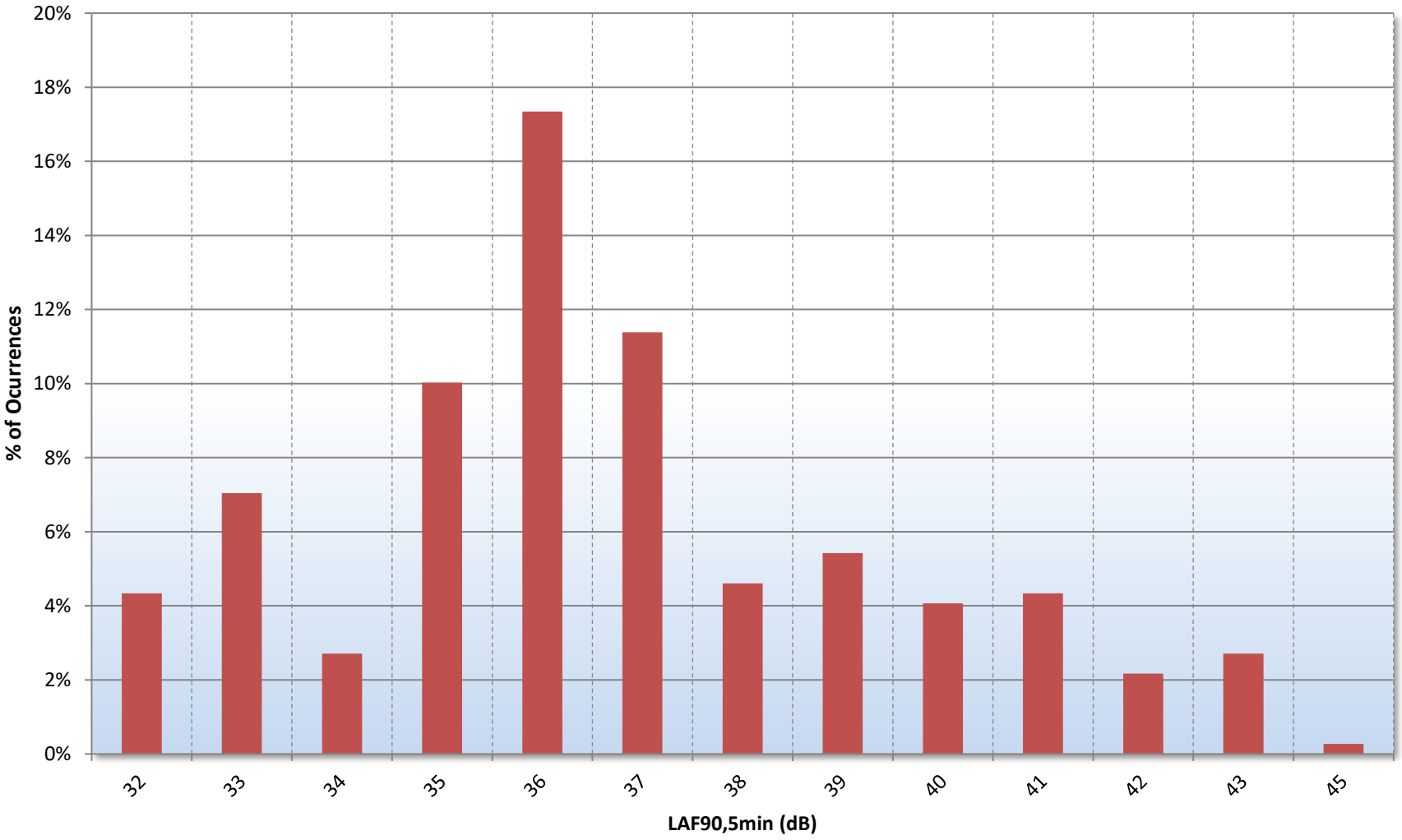

Figure 30000.Night-time L90.TH2

APPENDIX A

GENERAL ACOUSTIC TERMINOLOGY

Decibel scale - dB

In practice, when sound intensity or sound pressure is measured, a logarithmic scale is used in which the unit is the 'decibel', dB. This is derived from the human auditory system, where the dynamic range of human hearing is so large, in the order of 10^{13} units, that only a logarithmic scale is the sensible solution for displaying such a range.

Decibel scale, 'A' weighted - dB(A)

The human ear is less sensitive at frequency extremes, below 125Hz and above 16Khz. A sound level meter models the ears variable sensitivity to sound at different frequencies. This is achieved by building a filter into the Sound Level Meter with a similar frequency response to that of the ear, an A-weighted filter where the unit is dB(A).

L_{eq}

The sound from noise sources often fluctuates widely during a given period of time. An average value can be measured, the equivalent sound pressure level L_{eq}. The L_{eq} is the equivalent sound level which would deliver the same sound energy as the actual fluctuating sound measured in the same time period.

L_{10}

This is the level exceeded for no more than 10% of the time. This parameter is often used as a "not to exceed" criterion for noise.

L_{90}

This is the level exceeded for no more than 90% of the time. This parameter is often used as a descriptor of "background noise" for environmental impact studies.

L_{max}

This is the maximum sound pressure level that has been measured over a period.

Octave Bands

In order to completely determine the composition of a sound it is necessary to determine the sound level at each frequency individually. Usually, values are stated in octave bands. The audible frequency region is divided into 11 such octave bands whose centre frequencies are defined in accordance with international standards. These centre frequencies are: 16, 31.5, 63, 125, 250, 500, 1000, 2000, 4000, 8000 and 16000 Hertz.

Environmental noise terms are defined in BS7445, *Description and Measurement of Environmental Noise*.

APPENDIX A

APPLIED ACOUSTIC TERMINOLOGY

Addition of noise from several sources

Noise from different sound sources combines to produce a sound level higher than that from any individual source. Two equally intense sound sources operating together produce a sound level which is 3dB higher than a single source and 4 sources produce a 6dB higher sound level.

Attenuation by distance

Sound which propagates from a point source in free air attenuates by 6dB for each doubling of distance from the noise source. Sound energy from line sources (e.g. stream of cars) drops off by 3dB for each doubling of distance.

Subjective impression of noise

Hearing perception is highly individualised. Sensitivity to noise also depends on frequency content, time of occurrence, duration of sound and psychological factors such as emotion and expectations. The following table is a guide to explain increases or decreases in sound levels for many scenarios.

Change in sound level (dB)	Change in perceived loudness
1	Imperceptible
3	Just barely perceptible
6	Clearly noticeable
10	About twice as loud

Transmission path(s)

The transmission path is the path the sound takes from the source to the receiver. Where multiple paths exist in parallel, the reduction in each path should be calculated and summed at the receiving point. Outdoor barriers can block transmission paths, for example traffic noise. The effectiveness of barriers is dependent on factors such as its distance from the noise source and the receiver, its height and construction.

Ground-borne vibration

In addition to airborne noise levels caused by transportation, construction, and industrial sources there is also the generation of ground-borne vibration to consider. This can lead to structure-borne noise, perceptible vibration, or in rare cases, building damage.

Sound insulation - Absorption within porous materials

Upon encountering a porous material, sound energy is absorbed. Porous materials which are intended to absorb sound are known as absorbents, and usually absorb 50 to 90% of the energy and are frequency dependent. Some are designed to absorb low frequencies, some for high frequencies and more exotic designs being able to absorb very wide ranges of frequencies. The energy is converted into both mechanical movement and heat within the material; both the stiffness and mass of panels affect the sound insulation performance.

APPENDIX B

11 Grange Gardens, London, NW3 7XG

PLANT NOISE EMISSIONS CALCULATIONS

Source: Plant location 01 **Receiver: NSR 01**	***Frequency, Hz***								***dB(A)***
	63	***125***	***250***	***500***	***1k***	***2k***	***4k***	***8k***	
Plant unit 01(Sound Pressure Level @1m)	44	42	51	44	37	35	27	25	46
Minimum attenuation provided by distance (2.5m), dB	-8	-8	-8	-8	-8	-8	-8	-8	
Total Rating Noise Level of all Plant Unit Installations at Receiver	**36**	**34**	**43**	**36**	**29**	**27**	**19**	**17**	**38**

Source: Plant location 01 **Receiver: NSR 02**	***Frequency, Hz***								***dB(A)***
	63	***125***	***250***	***500***	***1k***	***2k***	***4k***	***8k***	
Plant unit 01 (Sound Pressure Level @1m)	44	42	51	44	37	35	27	25	46
Minimum attenuation due to building envelope, dB	-12	-16	-19	-24	-25	-25	-25	-25	
Minimum attenuation provided by distance (17m), dB	-25	-25	-25	-25	-25	-25	-25	-25	
Total Rating Noise Level of all Plant Unit Installations at Receiver	**7**	**2**	**7**	**-4**	**-13**	**-14**	**-22**	**-25**	**0**

Source: Plant location 02 **Receiver: NSR 03**	***Frequency, Hz***								***dB(A)***
	63	***125***	***250***	***500***	***1k***	***2k***	***4k***	***8k***	
Plant unit 02 (Sound Pressure Level @1m)	56	56	53	51	48	42	36	33	53
Minimum attenuation due to building envelope, dB	-12	-16	-19	-24	-25	-25	-25	-25	
Minimum attenuation provided by distance (14m), dB	-23	-23	-23	-23	-23	-23	-23	-23	
Total Rating Noise Level of all Plant Unit Installations at Receiver	**20**	**18**	**10**	**4**	**0**	**-6**	**-12**	**-15**	**8**

Source: Plant location 02 **Receiver: NSR 04**	***Frequency, Hz***								***dB(A)***
	63	***125***	***250***	***500***	***1k***	***2k***	***4k***	***8k***	
Plant unit 02 (Sound Pressure Level @1m)	56	56	53	51	48	42	36	33	53
Minimum attenuation due to building envelope, dB	-13	-16	-20	-24	-25	-25	-25	-25	
Minimum attenuation provided by distance (7m), dB	-17	-17	-17	-17	-17	-17	-17	-17	
Total Rating Noise Level of all Plant Unit Installations at Receiver	**26**	**23**	**16**	**10**	**6**	**0**	**-6**	**-9**	**14**

Source: Plant location 02 **Receiver: NSR 05**	***Frequency, Hz***								***dB(A)***
	63	***125***	***250***	***500***	***1k***	***2k***	***4k***	***8k***	
Plant unit 02 (Sound Pressure Level @1m)	56	56	53	51	48	42	36	33	53
Minimum attenuation due to building envelope, dB	-12	-16	-19	-24	-25	-25	-25	-25	
Minimum attenuation provided by distance (22m), dB	-27	-27	-27	-27	-27	-27	-27	-27	
Total Rating Noise Level of all Plant Unit Installations at Receiver	**17**	**14**	**6**	**0**	**-4**	**-10**	**-15**	**-19**	**4**