

Holborn Town Hall 193-197 High Holborn London

Environmental Noise Survey and Plant Noise Assessment Report

25331/PNA1

05 July 2018

For:
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c/o Rolfe Judd
Old Church Court
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Document Control

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1.0 Introduction

A new air conditioning system is proposed to be installed at the Grade II listed former Holborn Town Hall - which now comprises municipal offices.

Hann Tucker Associates have therefore been commissioned to use data from a previously undertaken environmental noise survey at the site, to set plant noise emission requirements based on Local Authority criteria and advise on necessary noise control measures to meet the requirements.

This report presents the survey methodology and findings. The survey data has been used to recommend plant noise emissions criteria and assess if these are achievable with the proposed development.

2.0 Objectives

To identify noise emission limits from the development based on the results of our previously undertaken environmental noise survey, and with reference to the requirements of the Local Authority and/or the application of BS 4142: 2014 and to minimise the possibility of noise nuisance by neighbours.

To assess the noise emissions from the proposed plant, based upon data with which we are provided, and comment upon the acceptability.

To advise on noise control measures if required with reference to the requirements of the Local Authority.

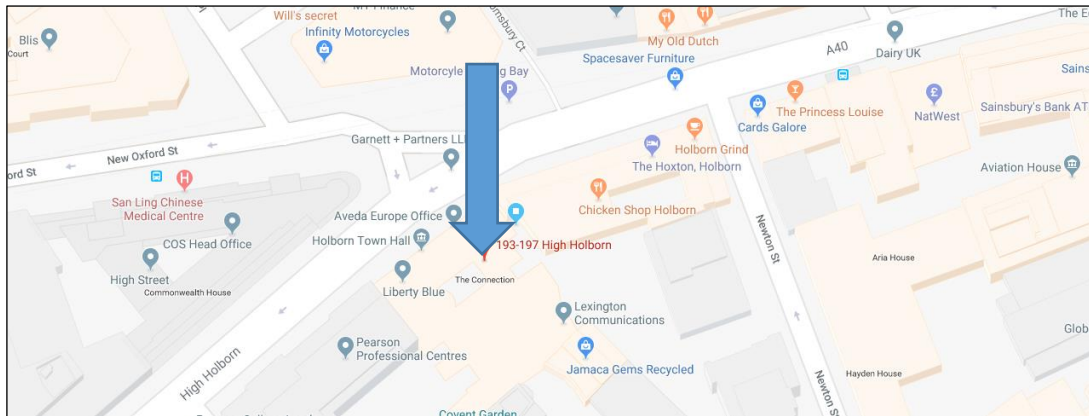
To present our methodology and findings in a detailed Environmental Noise Survey and Plant Noise Assessment Report to accompany the planning application.

3.0 Site Description

3.1 Location

The site is located at 193-197 High Holborn WC1V 7BD.

The location is shown in the Location Map below.



Location Map © 2018 Google Maps

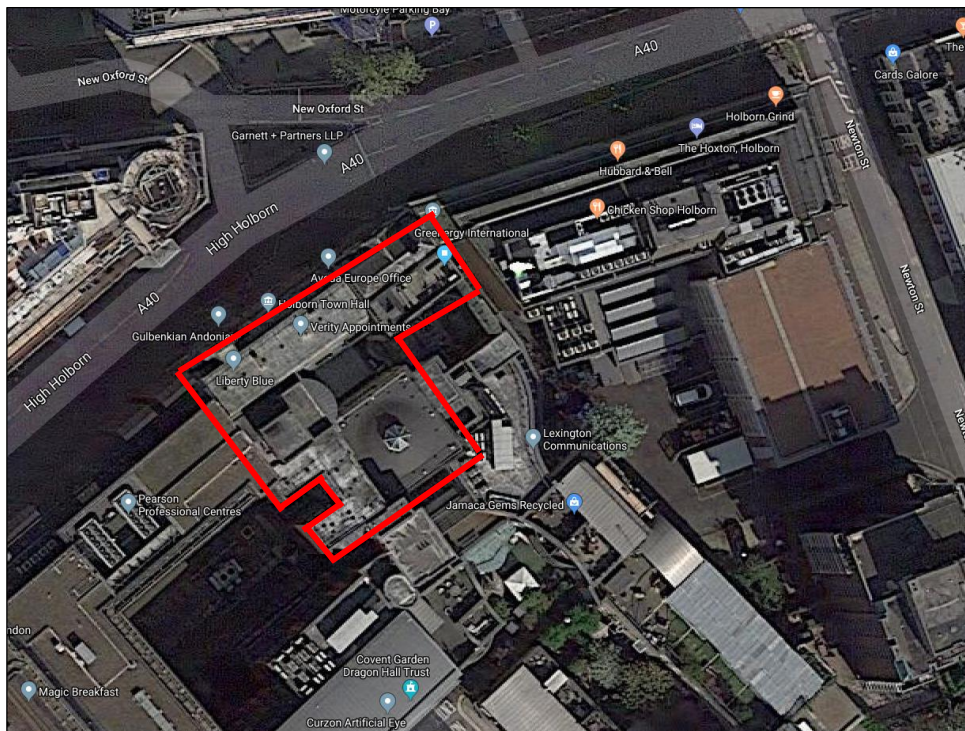
The site falls within the jurisdiction of Camden Borough Council.

3.2 Description

The site is a Grade II listed building and former town hall currently comprising offices.

The building is of varied heights up to six floors surrounding a central hall. The site is adjoined by buildings of a similar height and of office/commercial use.

The approximate site boundary is shown in the Site Plan below.



Site Plan © Google Maps 2018



4.0 Acoustic Terminology

For an explanation of the acoustic terminology used in this report please refer to Appendix A enclosed.

5.0 Survey Methodology

The survey was undertaken by Daniel Stuart BSc (Hons) AMIOA.

5.1 Procedure

Fully automated environmental noise monitoring was undertaken from approximately 2.45pm hours on 11 May 2018 to 2.45pm hours on 12 May 2018.

During the periods we were on site the wind conditions were calm. The sky was generally clear. We understand that generally throughout the survey period the weather conditions were partly cloudy. These conditions are considered suitable for obtaining representative measurement results.

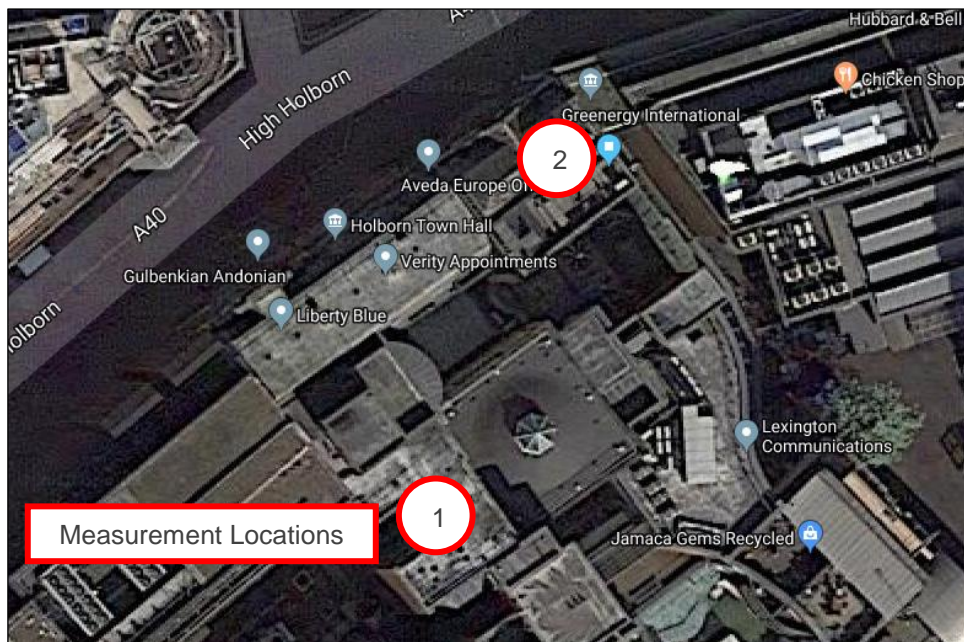
Measurements were taken continuously of the A-weighted (dBA) L_{90} , L_{eq} and L_{max} sound pressure levels.

5.2 Measurement Positions

The noise level measurements were undertaken at two positions as described in the table below.

Position No	Description
1	Sound level meter was located on the 4 th floor (plus ground) rooftop. Microphone mounted on pole approximately 15m above ground and 35m from the nearest road (High Holborn).
2	Sound level meter was located on the 4 th floor (plus ground) rooftop on the site boundary with property at 199 High Holborn. Microphone mounted on pole at a height of approximately 18m and 10m from the nearest road (High Holborn).

The positions are shown on the plan below.



Location Map © 2018 Google Maps

Description	Manufacturer	Type	Serial Number
Position 1 Type 1 ½" Condenser Microphone	PCB	377B02	122885
Position 1 Type 1 Preamp	Larson Davis	PRM902	3692
Position 1 Type 1 Data Logging Sound Level Meter	Larson Davis	824	3444
Position 2 Type 1 ½" Condenser Microphone	ACO Pacific	7052E	52450
Position 2 Type 1 Preamp	Svantek	SV12L	30424
Position 2 Type 1 Data Logging Sound Level Meter	Svantek	957	28035

Each sound level meter, including the extension cable, was calibrated prior to and on completion of the surveys. No significant changes were found to have occurred.



Each sound level meter was located in an environmental case with the microphone connected to the sound level meter via an extension cable. Each microphone was fitted with a windshield.

6.0 Results

The results have been plotted on Time History Graphs 25331/TH1 and 25331/TH2 enclosed presenting the 15 minute A-weighted (dBA) L_{90} , L_{eq} and L_{max} levels at each measurement position throughout the duration of the survey.

Using the guidance outlined from Section 8.1.4 (below) in BS4142:2014, a background level to be used with the Local Authority criteria has been selected using statistical analysis. See graphs 25331/BG1.1 to 25331/BG2.2 enclosed.

“NOTE 1 To obtain a representative background sound level a series of either sequential or disaggregated measurements ought to be carried out for the period(s) of interest, possibly on more than one occasion. A representative level ought to account for the range of background sound levels and ought not automatically to be assumed to be either the minimum or modal value.”

The following table presents the L_{A90} background noise levels during the survey.

Position	Measured L_{A90} Background Noise Level (dB re 2 x 10 ⁻⁵ Pa)	
	Daytime (07:00 – 23:00) Hours	Night-time (23:00 – 07:00) Hours
1	52	48
2	54	47

7.0 Discussion Of Noise Climate

Due to the nature of the survey, i.e. unmanned, it is not possible to accurately describe the dominant noise sources, or specific noise events throughout the entire survey period. However at the beginning and end of the survey period the dominant noise sources were noted to be traffic noise from the surrounding roads and neighbouring rooftop plant noise.

8.0 Plant Noise Emission Criteria

8.1 BS 4142:2014

When setting plant noise emission criteria reference is commonly made to BS 4142: 2014 “Methods for rating and assessing industrial and commercial sound”.



BS 4142 states that: *“The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs”. An estimation of the impact of the specific noise can be obtained by the difference of the rating noise level and the background noise level and considering the following:*

- *“Typically, the greater this difference, the greater the magnitude of the impact.”*
- *“A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context.”*
- *“A difference of around +5dB is likely to 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 the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.”*

The determination of the “rating level” and the “background level” are both open to interpretation, depending on the context.

In summary it is not possible to set plant noise emission criteria purely on the basis of BS 4142:2014. It is reasonable to infer from the above, however, that a difference of around -5dB corresponds to “No Observed Effect Level” as defined in the Noise Policy Statement for England.

8.2 Plant Noise Emission Criteria

The site comes under the jurisdiction of Camden Borough Council, which outlines its requirements as below in *Camden Local Plan 2017: Appendix 3*

“...a ‘Rating Level’ of 10 dB below background (15dB if tonal components are present) should be considered as the design criterion



Existing Noise Sensitive Receptor	Assessment Location	Design Period	LOAEL (Green)	LOAEL to SOAEL (Amber)	SOAL (Red)
Dwellings**	Garden used for main amenity (free field) and Outside living or dining window (façade)	Day	'Rating level' 10dB below background	'Rating level' 9dB below and 5dB above background	'Rating level' greater than 5dB above background
Dwellings **		Night	'Rating level' 10dB below background and no events exceeding 57dBL _{Amax}	'Rating level' 9dB below and 5dB above background or noise events between 57dB and 88dBL _{Amax}	'Rating level' greater than 5dB above background and/or events exceeding 88dBL _{Amax}

*10dB should be increased to 15dB if the noise contains audible tonal elements. (day and night). However, if it can be demonstrated that there is no significant difference in the character of the residual background noise and the specific noise from the proposed development then this reduction may not be required. In addition, a frequency analysis (to include, the use of Noise Rating (NR) curves or other criteria curves) for the assessment of tonal or low frequency noise may be required.

**Levels are given for dwellings, however, levels are use specific and different levels will apply dependant on the use of premises”

Noting these criteria are given for residential dwellings and the primary noise sensitive neighbours are offices and commercial units, this rating level may be considered too stringent for the less noise sensitive neighbours. We would consider a rating level of 5dB below background a reasonable criteria for offices and commercial units.

On the basis of the above and the results of the environmental noise survey, we propose that the following plant noise emission criteria be achieved at 1 metre from the nearest noise sensitive window.

Position	Plant Noise Emission Criteria (dB re 2x10 ⁻⁵ Pa)	
	Daytime (07:00 – 23:00) Hours	Night-time (23:00 – 07:00) Hours
1	47	43
2	49	42



The above criteria are to be achieved with all of the proposed plant operating simultaneously.

If plant contains tonal or impulsive characteristics the external design criteria should be reduced by 5dBA.

It should be noted that the above are subject to the final approval of the London Borough of Camden Borough Council.

9.0 Plant Noise Impact Assessment

We understand the proposed plant comprises a single Mitsubishi Electric PURY-P400YNW-A.

9.1 Plant Noise Data

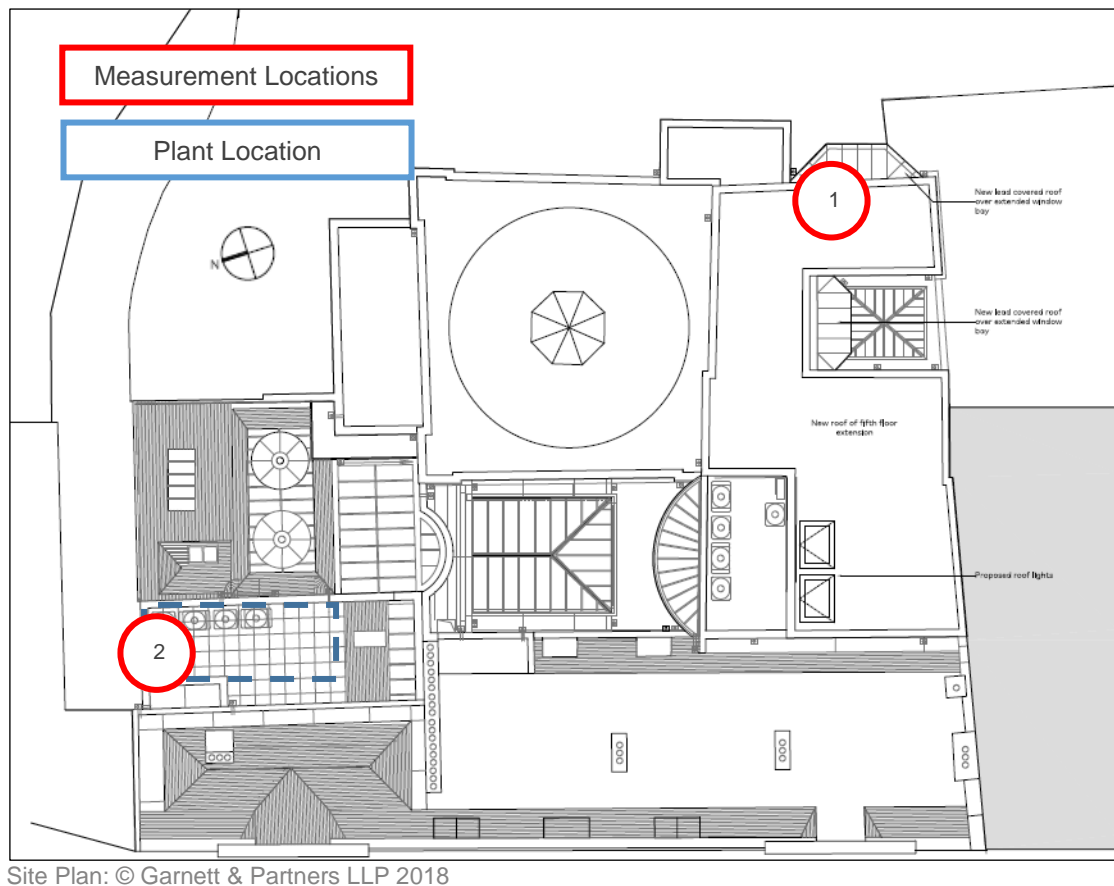
We understand the manufacturer's noise data for the equipment to be as follows:

Plant Description	Sound Pressure Level (dB re 2×10^{-5} Pa) at 1 metre at Octave Band Centre Frequency (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
PURY-P400YNW-A	73	64.5	66	64.5	59	54.5	49	46	65

9.2 Location of Plant

The proposed plant location is the 5th floor rooftop, on the northern side of the building. This is approximately 10m horizontally away, and two storeys above the nearest neighbouring office window. There is a 1m barrier comprising a brick wall separating the plant area from the neighbouring property.

The position is shown on the plan below.



9.3 Plant Noise Impact Assessment

We understand that the proposed unit will be operational during daytime and night-time hours.

The following table summarises our predictions of atmospheric noise emissions from the proposed plant areas to the nearest commercial window, assuming the existing barriers around the proposed plant areas remain in place.

Description	Sound Pressure Level (dB re 2×10^{-5} Pa) at Octave Band Centre Frequency (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
Sound Pressure Level at 1m	73	64.5	66	64.5	59	54.5	49	46	65
Distance Correction	-20	-20	-20	-20	-20	-20	-20	-20	-20
Barrier Correction	-5	-6	-6	-7	-9	-11	-14	-16	-7
Calculated Noise Level at Receptor	48	39	40	38	30	24	15	10	38

Our calculations indicate that the proposed plant should be capable of achieving the requirements of the Local Authority outlined in Section 8.0.



10.0 Conclusions

An environmental noise survey has been undertaken in order to establish the currently prevailing noise levels.

Plant noise emission criteria have been recommended based on the results of the noise survey and with reference to the Local Authority's policy.

An assessment has been carried out to determine the plant noise emissions at the nearest noise sensitive window.

The assessment indicates that the proposed plant should be capable of achieving the requirements of the Local Authority.

Appendix A

The acoustic terms used in this report are defined as follows:

dB Decibel - Used as a measurement of sound level. Decibels are not an absolute unit of measurement but an expression of ratio between two quantities expressed in logarithmic form. The relationships between Decibel levels do not work in the same way that non-logarithmic (linear) numbers work (e.g. 30dB + 30dB = 33dB, not 60dB).

dBA The human ear is more susceptible to mid-frequency noise than the high and low frequencies. The 'A'-weighting scale approximates this response and allows sound levels to be expressed as an overall single figure value in dBA. The _A subscript is applied to an acoustical parameter to indicate the stated noise level is A-weighted

It should be noted that levels in dBA do not have a linear relationship to each other; for similar noises, a change in noise level of 10dBA represents a doubling or halving of subjective loudness. A change of 3dBA is just perceptible.

L_{90,T} L₉₀ is the noise level exceeded for 90% of the period *T* (i.e. the quietest 10% of the measurement) and is often used to describe the background noise level.

L_{eq,T} L_{eq,T} is the equivalent continuous sound pressure level. It is an average of the total sound energy measured over a specified time period, *T*.

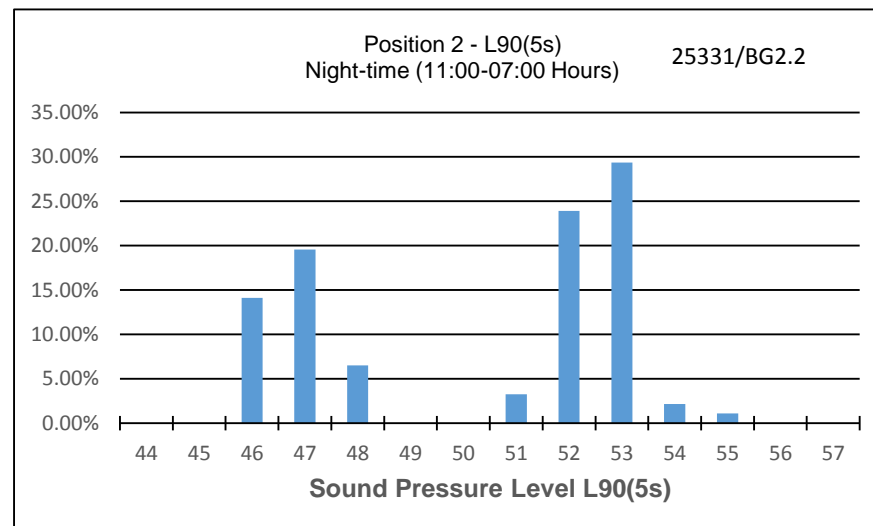
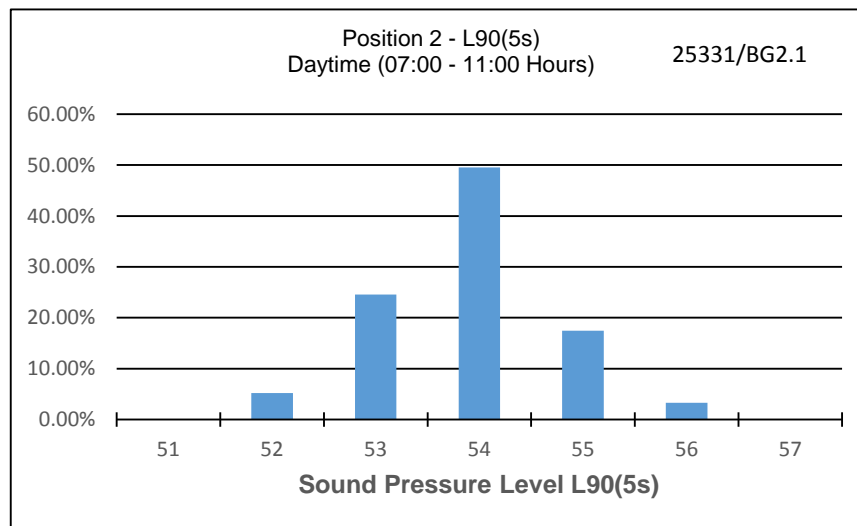
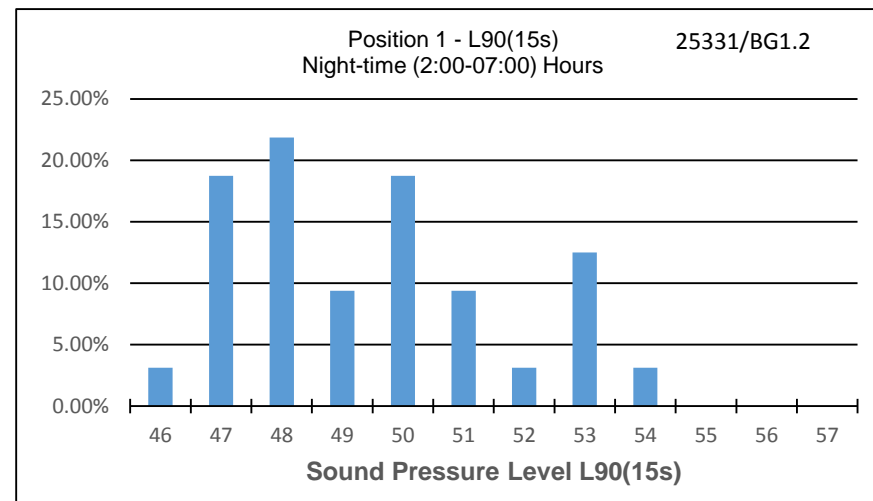
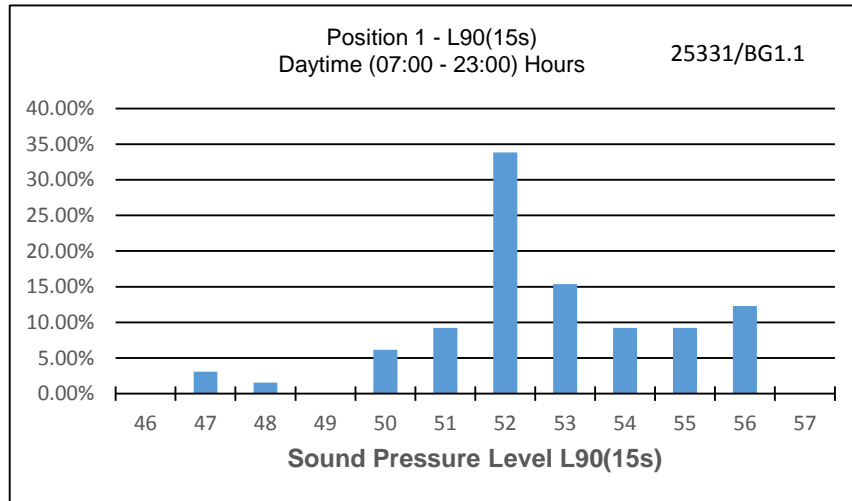
L_{max} L_{max} is the maximum sound pressure level recorded over the period stated. L_{max} is sometimes used in assessing environmental noise where occasional loud noises occur, which may have little effect on the L_{eq} noise level.

Sound Pressure Level (L_p) is the sound pressure relative to a standard reference pressure of 2×10^{-5} Pa. This level varies for a given source according to a number of factors (including but not limited to: distance from the source; positioning; screening and meteorological effects).

Sound Power Level (SWL or L_w) is the total amount of sound energy inherent in a particular sound source, independent of its environment. It is a logarithmic measure of the sound power in comparison to a specified reference level (usually 10^{-12} W).

Background Noise Level Distribution

High Holborn 25331/BG1.1-25331/BG2.2



High Holborn

Position 1

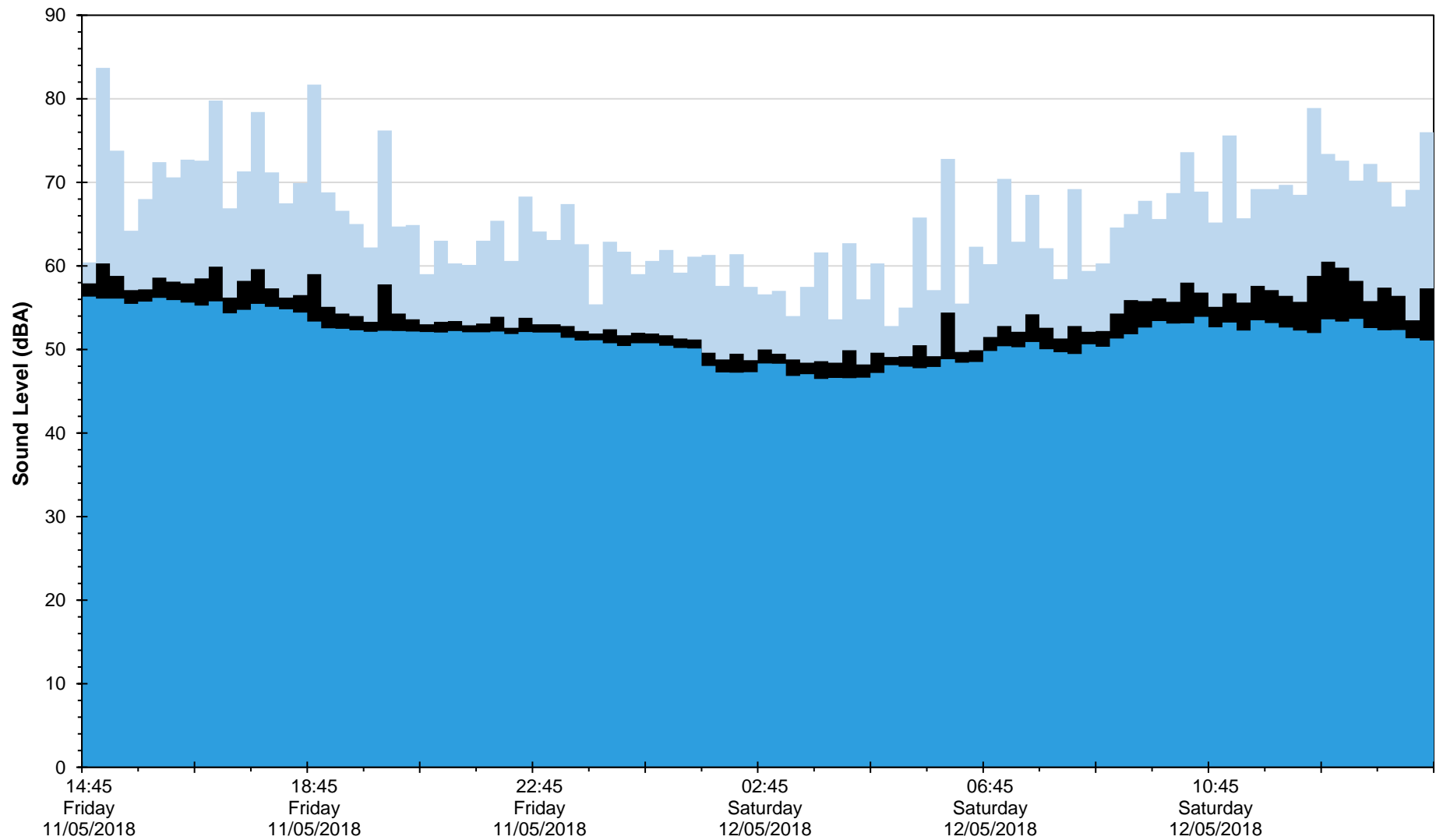
L_{Aeq} , L_{Amax} and L_{A90} Noise Levels

Friday 11 May 2018 to Saturday 12 May 2018

■ L_{Amax}

■ L_{Aeq}

■ L_{A90}



Date and Time

25331/TH1

High Holborn

Position 2

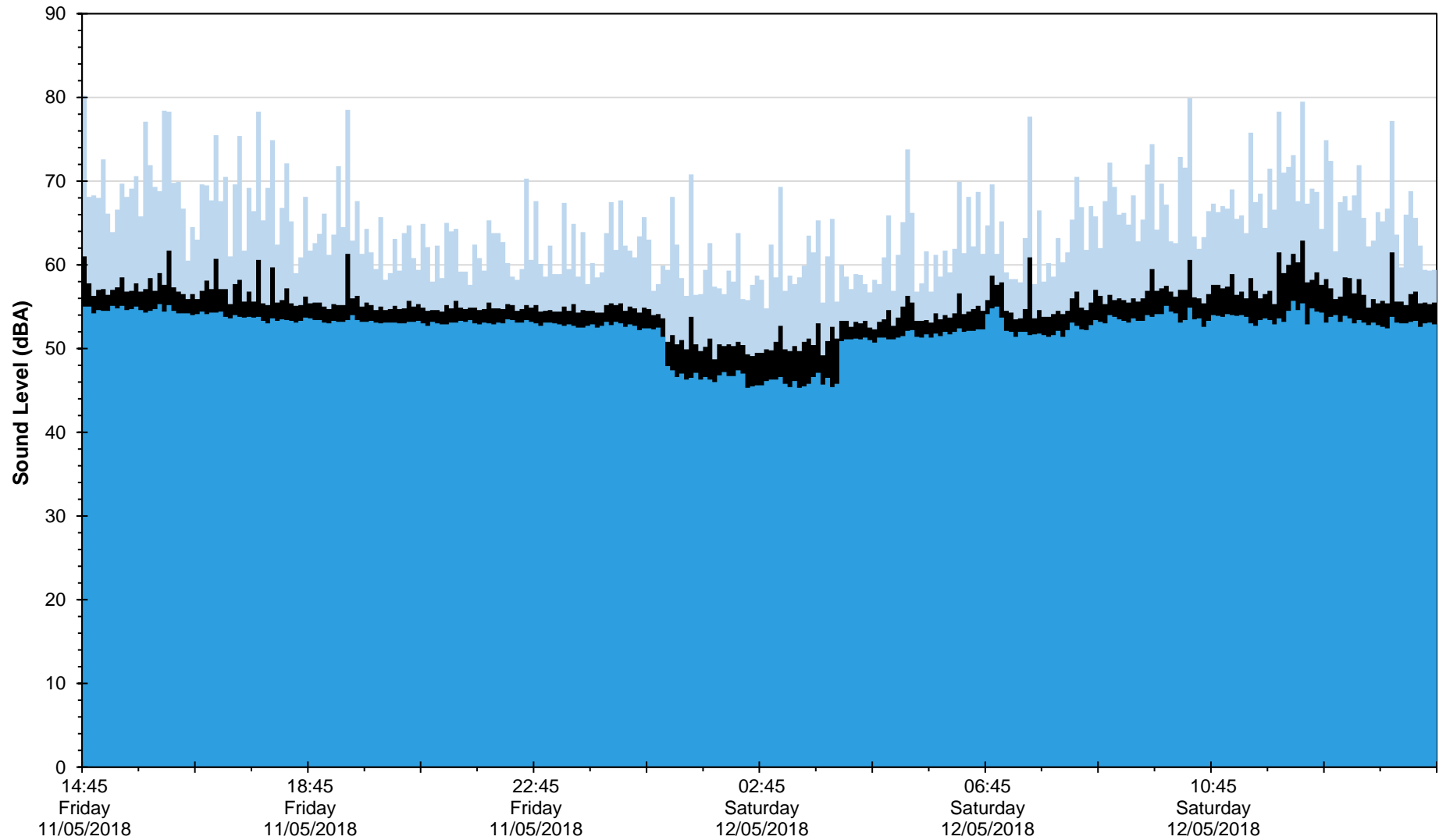
L_{Aeq} , L_{Amax} and L_{A90} Noise Levels

Friday 11 May 2018 to Saturday 12 May 2018

■ L_{Amax}

■ L_{Aeq}

■ L_{A90}



Date and Time

25331/TH2