

43 Shelton Street

**Environmental Noise Survey and
Plant Noise Assessment Report**

24547/PNA1-Rev2

31 August 2017

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Document Control

Rev	Date	Comment	Prepared and Authorised by	
0	10-07-2017			
			Firas Farhan Principal Consultant BSc(Hons), MIOA	
1	04-08-2017	Changes clarifying barrier losses		
			Firas Farhan Principal Consultant BSc(Hons), MIOA	
2	31-08-2017	Updated local authority criteria. New plant specifications and plant noise assessment.	Prepared by	Authorised by
				
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Appendix A – Acoustic Terminology

Graph 24547/TH1.01



1.0 Introduction

It is proposed to install items of building service plant at 43 Shelton Street.

Hann Tucker Associates have therefore been commissioned to undertake a detailed 24 hour daytime and night-time fully automated environmental noise survey of the site to establish the currently prevailing noise climate and propose suitable plant noise emission criteria, based on the results of the survey and the requirements of the Local Authority.

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

This report presents the survey methodology and findings.

2.0 Objectives

To establish, by means of detailed 24 hour daytime and night-time fully automated environmental noise monitoring, the existing A-weighted (dBA) L_{90} , L_{eq} and L_{max} environmental noise levels at a selected accessible position, thought to be representative of the nearest affected property.

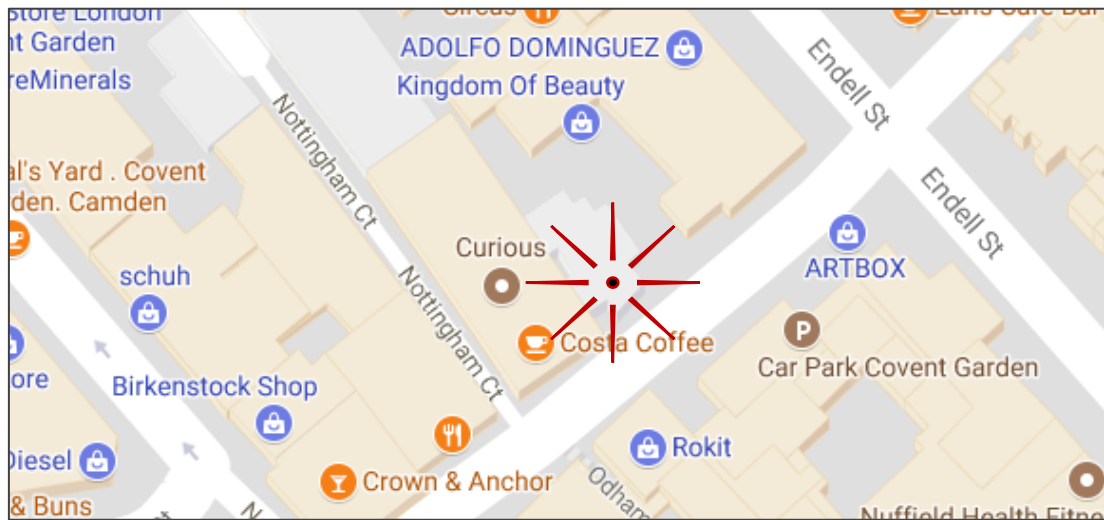
Based on the results of the noise survey, and with reference to the requirements of the Local Authority, to recommend suitable plant noise emission criteria.

To assess the proposed plant and comment on its acceptability.

3.0 Site Description

3.1 Location

The Site falls within London Borough of Camden's jurisdiction. The location is shown in the Location Map below.



(Map Data © 2015 Google)

3.2 Description

The site is a 4 storey commercial building which overlooks Shelton Street to the southeast. The area is surrounded by a mixture of commercial and residential buildings of similar height. See Site Plan below.

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

5.1 Procedure

Fully automated environmental noise monitoring was undertaken from approximately 12:00 hours on Tuesday 04 July 2017 to approximately 12:00 hours on Wednesday 05 July 2017.

Due to the nature of the survey, i.e. unmanned, it is not possible to accurately comment on the weather conditions throughout the entire survey period. However at the beginning and end of the survey period the wind conditions were moderate. The sky was generally clear. We understand that generally throughout the survey period the weather conditions were similar to this. These conditions are considered suitable for obtaining representative measurement results.

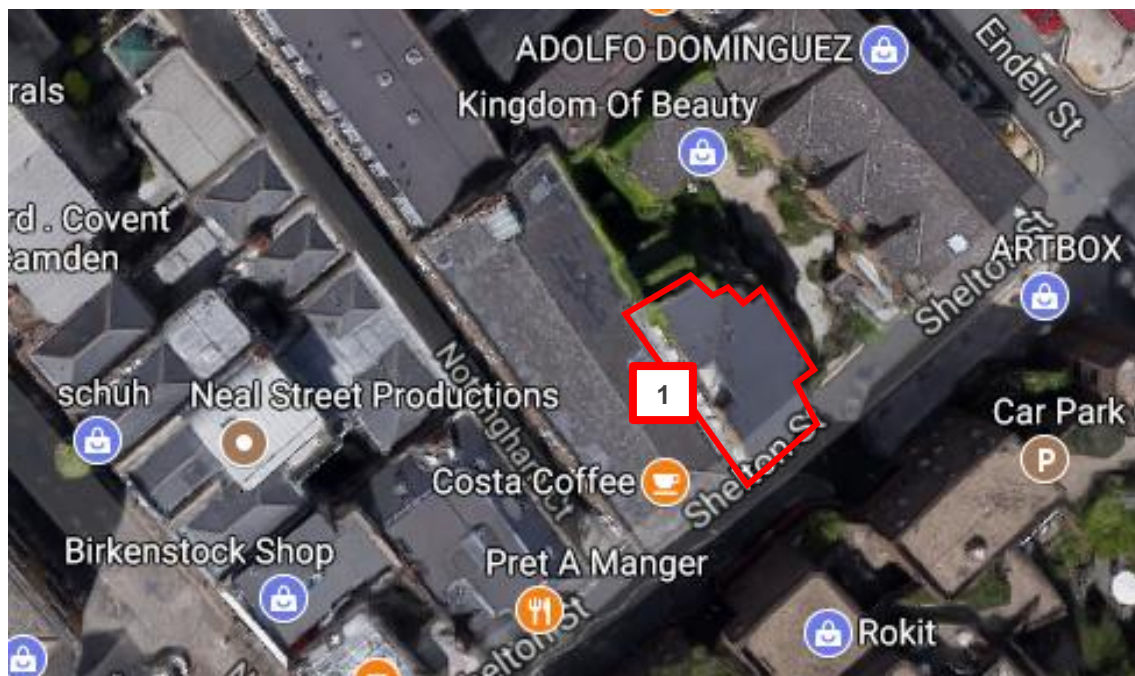


5.2 Measurement Position

The noise level measurements were undertaken at a single Position at the development site. The measurement position is described in the table below.

Position No	Description
1	The sound level meter was located to the rear on the 4th floor of the site. The microphone was attached to a pole approximately 2m above roof level and approximately 1m from the façade of the nearest residential dwellings.

The position was selected in order to assess the lowest noise levels at the development site for subsequent use in setting plant noise emission criteria and is shown on the plan below.



Measurement Position (Imagery © Google, Map Data © 2015 Google)

5.3 Instrumentation

The instrumentation used during the survey is presented in the table below:

Position	Description	Manufacturer	Type	Serial Number	Calibration
1	Type 1 Data Logging Sound Level Meter	Larson Davis	824	3802	Calibration on 11/07/2016



	Type 1 ½" Condenser Microphone	PCB	377B02	107040	Calibration on 11/07/2016
-	Type 1 Calibrator	Larson Davis	CAL200	3082	LD calibration on 03/07/2017

The sound level meter, including the extension cable, was calibrated prior to and on completion of the survey. No significant change was found to have occurred (no more than 0.1dB).

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

6.0 Results

The results have been plotted on Time History Graphs 24547/TH1.01 enclosed, presenting the 15 minute A-weighted (dBA) L_{90} , L_{eq} and L_{max} noise levels at the measurement position throughout the duration of the survey.

The lowest L_{A90} (15 min) measurements recorded during the survey are presented in the table below:

Position	Lowest Measured $L_{A90}(15min)$ Background Noise Level (dB re 2×10^{-5} Pa)		
	Daytime (07:00 – 23:00) Hours	Night-Time (23:00 – 07:00) Hours	24 Hours
1	45 dBA	42 dBA	42 dBA

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 source was noted to be from road traffic on surrounding roads and nearby building services plant.

8.0 Plant Noise Emission Criteria

The site falls within the London Borough of Camden. We understand the London Borough of Camden's advice relating to noise emissions from air conditioning plant is as follows:



“Where appropriate and within the scope of the document 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 order to meet the above advice, noise emissions from the proposed plant should not exceed a level of 10dB below the lowest measured $L_{A90(15min)}$. Therefore, based on the results of the noise survey and the advice above, we recommend the following plant noise emission levels to be achieved with all plant running simultaneously at 1m external to the nearest noise sensitive façade.

Plant Noise Emission Criteria (dBA re:2x10 ⁻⁵ Pa)
Daytime (07:00 – 23:00 hours)
35 dBA

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

9.0 Plant Noise Impact Assessment

It is proposed to install the following items of building services plant.

Plant Description	Location	Qty	Plant Make	Model Number
Condenser	Roof	2	Mitsubishi Electric	MXZ-4D83VA

9.1 Plant Noise Data

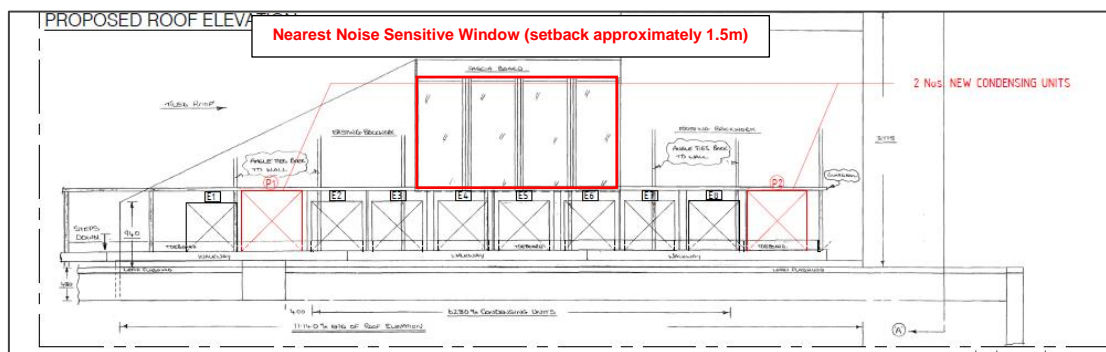
We understand the manufacturer's noise data for the equipment is as follows:

Plant Description	Sound Pressure Level at 1m (dB re 2x10 ⁻⁵ Pa)
MXZ-4D83VA	50 dBA



9.2 Location of Plant

We understand it is proposed to install the condensers on the roof of the site on each end of a row on existing condensers. The nearest noise sensitive receptor is a residential window recessed by approximately 1.5m and approximately 5m away from the proposed plant. The proposed plant thus benefits from screening by the building envelope. The plan below shows the plant location in relation to the nearest noise sensitive window.



(Courtesy of CBRE Ltd)

9.3 Plant Noise Impact Assessment

We understand that the proposed unit will be operational during daytime hours only.

The following tables present our calculations relating to the proposed plant installation.

Description	Sound Pressure Level (dB re 2×10^{-5} Pa)
Unit 1	50 dBA at 1 m
Distance Correction	-11 dBA
Screening Loss from Building Envelope	-13 dBA
Unit 2	50 dBA at 1 m
Distance Correction	-11 dBA
Screening Loss from Building Envelope	-13 dBA
Cumulative Noise Level at the Nearest Noise Sensitive Receptor	29 dBA
Façade Reflection	+3
Resultant Noise Level at the Nearest Noise Sensitive Receptor	32 dBA

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 planning condition.

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 at the nearest noise sensitive residential window.

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).

43 Shelton Street

Position 1

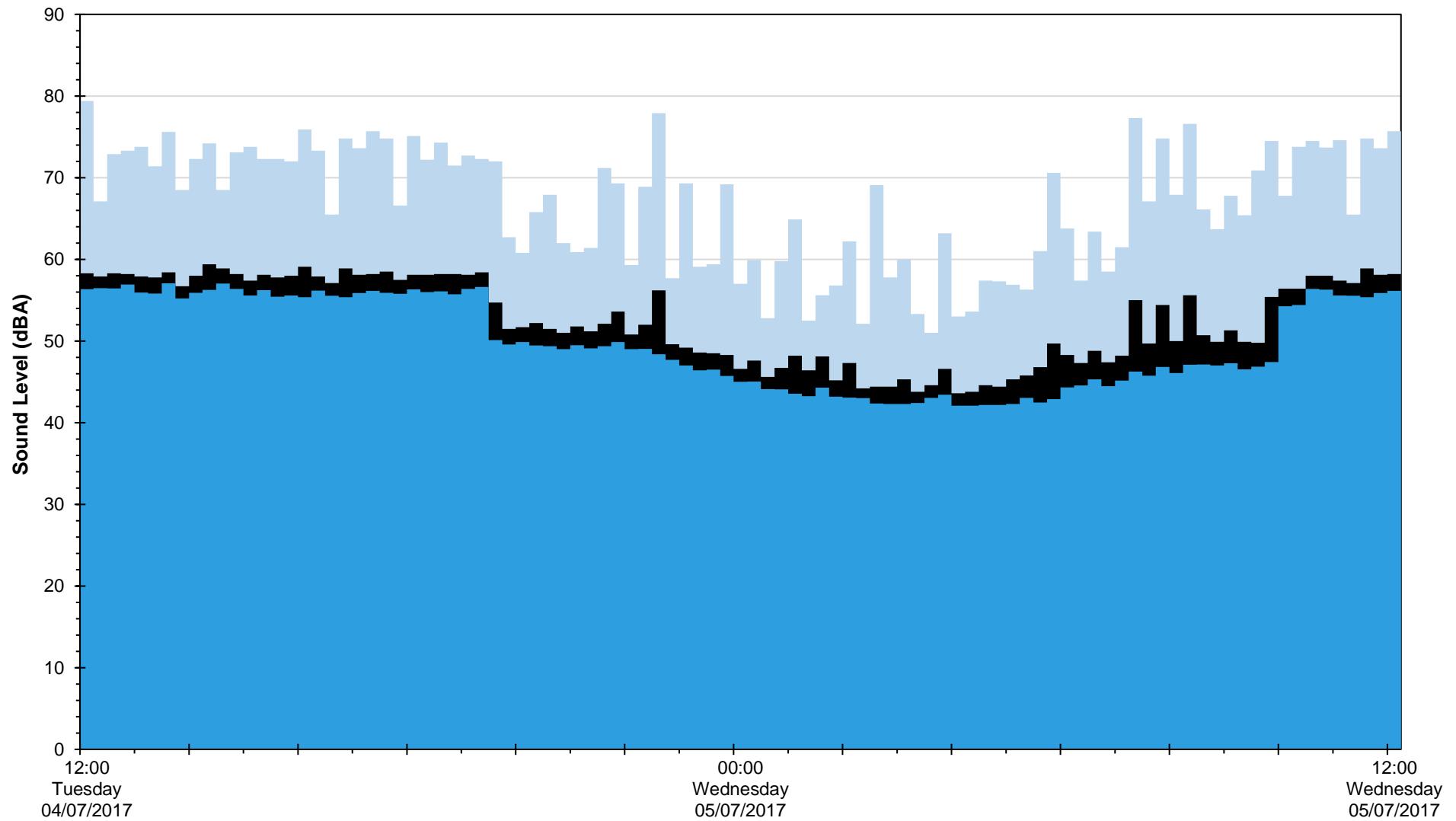
L_{Aeq} , L_{Amax} and L_{A90} Noise Levels

Tuesday 4 July 2017 to Wednesday 5 July 2017

■ L_{Amax}

■ L_{Aeq}

■ L_{A90}



Date and Time

24547/TH1.01