# 15 Shorts Gardens & 2-3 Neal's Yard London WC2H 9AT

Environmental Noise Survey and Plant Noise Assessment Report

31993/PNA1/Rev01

24 January 2025

For: Fresson and Tee Queens House 55-56 Lincoln's Inn Fields London WC2A 3LJ



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# **Document Control**

Rev	Date	Comment	Prepared by	Reviewed by	Approved by
		Revised to include	Alt -	<u> 20-0</u>	har fin
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# Environmental Noise Survey and Plant Noise Assessment Report 31993/PNA1/Rev01

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## 1.0 Introduction

Hann Tucker Associates Limited (Hann Tucker) has been commissioned by Fresson and Tee to undertake a plant noise assessment for a site in Seven Dials, London.

The site, which is located on Short's Gardens and backs onto Neal's Yard, is proposing to install new external building services plant as part of the redevelopment of the site.

Hann Tucker Associates has therefore been commissioned to undertake a detailed environmental noise survey at the site to establish baseline noise conditions as presented herein.

Suitable plant noise emission criteria based on the requirements of the of the Local Authority and the application of BS 4142: 2014+ A1:2019 have been established, and a plant noise impact assessment undertaken.

# 2.0 Objectives

To undertake an environmental noise survey to establish the existing L<sub>Amax</sub>, L<sub>Aeq</sub> and L<sub>A90</sub> environmental road, rail and air traffic noise levels at selected accessible positions.

The survey will enable noise emission limits from the development to be identified with reference to the requirements of the Local Authority and/or the application of BS 4142: 2014 + A1:2019 and to minimise the possibility of noise nuisance to neighbours.

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

# 3.0 Acoustic Terminology

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

#### 4.1 Location

The site is located within the busy shopping area of Seven Dials near Covent Garden in London.

The location is shown in the Location Map below.



Location Map (Map Data © 2024)

The site falls within the jurisdiction of the London Borough of Camden.

#### 4.2 Description

The front façade of the site is located on Shorts Gardens, this is a predominantly commercial street with a number of different shops. The site itself is currently a vacant shopping unit on the ground floor with No. 6 storeys of residential units above, adjacent to the site there are buildings of a similar size, opposite the site there is the seven dials market which is a building consisting of a ground floor plus No. 2 storeys.

The rear façade of the site is on Neal's Yard which has a number of different shops, cafes and restaurants within the courtyard.

The site is shown in the Site Plan below.



Site Plan (Map Data © 2024)

#### **Planning Policies, Standards & Guidance** 5.0

#### 5.1 **Policies & Guides**

In order to provide a suitable assessment a number of national planning policies have been considered.

All guidance used to form a noise impact assessment is taken from various standards, guidance, and Local Authority requirements as summarised below:

- Local Planning Policy
- British Standard 4142:2014 + A1:2019
- Statutory Noise Nuisance •

Detailed information for relevant planning policies and guidance can be found within Appendix B.

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### 5.2 Specific Local Authority Criteria

The site lies within the jurisdiction of Camden City Council. The council have the following requirements pertaining to commercial/industrial noise sources:

#### "Industrial and Commercial Noise Sources

A relevant standard or guidance document should be referenced when determining values for LOAEL and SOAEL for non-anonymous noise. 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).

# Table C: Noise levels applicable to proposed industrial and commercial developments (including plant and machinery)

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 or bedroom window (façade)	Day	'Rating level' 10dB* below background	'Rating level' between 9dB below and 5dB above background	'Rating level' greater than 5dB above background
Dwellings**	Outside bedroom window (façade)	Night	'Rating level' 10dB* below background and no events exceeding 57dBL <sub>Amax</sub>	'Rating level' between 9dB below and 5dB above background or noise events between 57dB and 88dB L <sub>Amax</sub>	'Rating level' greater than 5dB above background and/or events exceeding 88dBL <sub>Amax</sub>

\*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 given are for dwellings, however, levels are use specific and different levels will apply dependent on the use of the premises.

The periods in Table C correspond to 0700 hours to 2300 hours for the day and 2300 hours to 0700 hours for the night. The Council will take into account the likely times of occupation for types of development and will be amended according to the times of operation of the establishment under consideration.

There are certain smaller pieces of equipment on commercial premises, such as extract ventilation, air conditioning units and condensers, where achievement of the rating levels (ordinarily determined by a BS:4142 assessment) may not afford the necessary protection. In these cases, the Council will generally also require a NR curve specification of NR35 or below, dependant on the room (based upon measured or predicted Leq,5mins noise levels in octave bands) 1 metre from the façade of affected premises, where the noise sensitive premise is located in a quiet background area."

## 6.0 Baseline Noise Survey

#### 6.1 Procedure

Fully automated environmental noise monitoring was undertaken by Greg Moore BA (Hons) AMIOA and assisted by James Corby from approximately 13:30 hours on Monday 28 October 2024 to 13:45 hours on Tuesday 29 October 2024 to establish existing baseline noise levels. Measurements were taken continuously of the A-weighted (dBA) L<sub>90</sub>, L<sub>eq</sub>, and L<sub>max</sub> sound pressure levels over discrete 15-minute periods.

#### 6.2 Measurement Position

The microphone was attached to a pole approximately 2.5 metres above ground level within the lightwell. The microphone was within free-field conditions and clear of any reflective surfaces.

The position is shown on the plan below.



Plan Showing Measurement Positions (Imagery © 2024, Google Maps, Map Data © 2024)

#### 6.3 Weather Conditions

For the unattended survey between Monday 28 October 2024 to Tuesday 29 October 2024, local weather reports indicated no notable periods of rainfall, with temperatures ranging from 10 °C (night) to 14 °C (day) and wind speeds less than 4 m/s. During our time on site, skies were overcast, wind conditions were calm and from a southerly direction and road surfaces were dry.

#### 6.4 Instrumentation

Description	Manufacturer	Туре	Serial Number	Calibration
Type 1 ½" Condenser Microphone	PCB	377B02	163037	Calibration on 20/08/2024
Preamp	Larson Davis	PRM902	3945	Calibration on 20/08/2024
Type 1 Data Logging Sound Level Meter	Larson Davis	824	2897	Calibration on 20/08/2024
Type 1 Calibrator	Bruel & Kjaer	4230	1511010	Calibration on 26/07/2024

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

The sound level meter, including the extension cable, was calibrated prior to and on completion of the surveys. No significant change was found to have occurred (no more than 0.2 dB).

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.

#### 6.5 Results

The results have been plotted on Time History Graph 31993/TH1 enclosed presenting the 15 minute A-weighted (dBA)  $L_{90}$ ,  $L_{eq}$  and  $L_{max}$  levels at the single measurement position throughout the duration of the survey.

BS 4142 states that "the background sound level must be reliable and suitably represent he particular circumstances and periods of interest. For this purpose, the objective is not simply to ascertain a lowest measured background sound level, but rather to quantify what is typical during particular time periods." Taking this into account, the following histograms have been created which display the occurrence of each sound level (L<sub>A90</sub>) for the day and night-time periods.



Daytime Histogram



Night-time Histogram

Based on the above plots the  $L_{A90}$  values presented below are considered to be the 'representative' background sound levels determined through statistical analysis of the 15-minute readings.

Representative Measured L <sub>A90(15min)</sub> Background Sound Level (dB re 2 x 10-5 Pa)				
Daytime (07:00 – 23:00) Hours	Night-Time (23:00 – 07:00) Hours			
47	47			

#### 6.6 Discussion Of Noise Climate

Due to the nature of the survey, i.e. unattended, 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 noise climate was noted to be dominated by the existing plant in the surrounding area.

## 7.0 Plant Noise Emission Criteria

Building services plant external noise emission levels will need to comply with local authority requirements and statutory noise nuisance legislation.

Based on the results of the noise survey and the requirements of the Local Authority (as outlined in Section 5.2), we propose that the following plant noise emission criteria be achieved incident at the nearest noise sensitive residential windows at the façade, with all plant operating simultaneously.

Rating Plant Noise Emiss	ion Criteria (L <sub>Ar,Tr</sub> , dB)
Measured Representative Background Noise Level	50dBA façade level <sup>[1]</sup>
Requirement	10dB below background at façade
Plant noise emission criteria	40 dBA at receptor

Notes:

[1] 3dB façade correction added to free field levels in accordance with BS4142

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

Noise shall be assessed in accordance with BS 4142:2014+A1:2019 with corrections applied for any plant emitting noise of a tonal or irregular quality.

It should be noted that the above is subject to the final approval of the Local Authority.

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# 8.0 Plant Noise Impact Assessment

### 8.1 **Proposed Plant**

#### 8.1.1 Plant Location

The proposed condenser unit is to be located within the lightwell between 15 Shorts Garden and 2-3 Neal's Yard. The nearest noise sensitive window is located at the flats above 2-3 Neal's Yard, this is approximately 1.5 meters away from the top of the proposed unit and enclosure.

Adjacent to the condenser unit there is proposed to be an extract fan for the bar area.

The proposed location is shown below:



Drawing provided by Fresson and Tee

#### 8.1.2 Plant Operation

At the time of writing the hours of operation are not known, therefore we have assessed the unit using the night-time levels. It should be noted these are the same as the daytime levels.

#### 8.1.3 Plant Noise Data

It is understood the new plant comprises a condenser and an extract fan.

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

Plant Description	Sound Power Level (dB re 10 <sup>-12</sup> W) at Octave Band Centre Frequency (Hz)								dBA
Fiant Description	63	125	250	500	1000	2000	4000	8000	UDA
Samsung AM060NXMDGREU	64	66	71	63	62	53	56	61	67

At the time of writing this report, the extract fan has not been selected. The fan should be selected and attenuated (if necessary) so as not to exceed a total limiting sound pressure level of 42 dBA when measured at 1m on-site (combination of case breakout, plus atmospheric noise).

#### 8.1.4 Attenuation Measures

There are already attenuation measures proposed by the client, consisting of an Environ ELV.1.1.25AC acoustic enclosure for the proposed condenser.

We received the documents 'Environ T8-1700 P1 Samsung AM06NXMDGREU' and the associated acoustic information. These documents outline the below transmission loss for the unit.

Enclosure Description	Transmission Loss — Environ ELV1.1.25AC Acoustic Enclosure at Octave Band Centre Frequency (Hz)							
Enclosure Description	63	125	250	500	1000	2000	4000	8000
Environ ELV.1.1.25AC	11	13	19	28	34	36	36	37

Specific details of the proposed tenant extract plant have not yet been finalised. All plant will be selected, located and attenuated such that the limiting sound pressure levels presented in Section 8.1.3 are achieved.

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Provision should be made for the following noise control measures as part of the inherent design to meet these requirements:

- Enclosing noisy plant within the building envelope; \_
- Selecting suitably quiet 'low noise' plant;
- Attenuation of air intake/discharge louvres with duct-mounted attenuators; \_
- Anti-vibration mounts to control structure-borne noise and vibration.

#### 8.2 **Plant Noise Impact Assessment**

The following table summarises our predictions of atmospheric noise emissions from the proposed condenser plant, considering the proposed mitigation measures set out in Section 8.1.4, to the nearest noise sensitive residential window.

		Sound Level at Octave Band Centre Frequency (Hz)							
	63	125	250	500	1000	2000	4000	8000	abri
Condenser SWL	64	66	71	63	62	53	56	61	67
Distance Loss (SWL to SPL 4m)	-19	-19	-19	-19	-19	-19	-19	-19	
Proposed Enclosure Attenuation	-11	-13	-19	-28	-34	-36	-36	-37	
Calculated Sound Pressure Level at Receptor	34	34	33	16	9	≤ 3	1	5	26

The following table summarises predictions of atmospheric noise emissions from the proposed extract fan, considering the limiting sound pressure levels presented in Section 8.1.3.

	Sound Pressure Level (dBA)
Extract Fan Sound Pressure Level at 1m	42
Distance Loss (3m)	-2
Calculated Sound Pressure Level at Receptor	40

The following table summarises our predictions of atmospheric noise emissions from the cumulative condenser plant and extract fan, considering the proposed mitigation measures set out in Section 8.1.4 and the limiting sound pressure levels presented in Section 8.1.3, to the nearest noise sensitive residential window.

	Sound Pressure Level (dBA)
Calculated Sound Pressure Level of Condenser Unit at Receptor	26
Calculated Sound Pressure Level of Extract Fan at Receptor	40
Calculated Cumulative Sound Pressure Level at Receptor	40

## 8.3 BS4142:2014+A1:2019 Assessment

Based on the above predictions of atmospheric noise emissions the table below provides an initial BS4142:2014+A1:2019 assessment.

Resu	ılts	Relevant Clause	Commentary	
Specific Sound Level (Cumulative Sound Pressure Level as above)	L <sub>Aeq</sub> = 40 dB	7.3.8 7.3.9 7.3.10	Specific noise level at the nearest receptor for all items of plant.	
Acoustic Feature Correction	0	9.2	We do not anticipate there to be an acoustic feature based on our understanding of the plant, and therefore no acoustic feature corrections have been added	
Rating level	(40+0) dB = 40 dB	9.2		
Representative Background Sound Level	Representative L <sub>A90</sub> = 50dB	8.1.1 8.1.3 8.3	Representative background sound level measured at the proposed development site during the day.	
Excess of rating over background sound level	(50-40) dB = -10 dB	11	Assessment indicates the likelihood of a low impact on the nearby residents, depending on the context.	
Assessment indicates likelihood of a low impact on the nearby residents, depending on the context.		11	The rating level does not exceed the background during the daytime hours.	
Uncertainty of the assessment	Low	10	The background sound level is based on repeatable measurements made over the duration of a 24-hour period.	

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

# 9.0 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 requirements.

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, in conjunction with the proposed mitigation measures, should be capable of achieving the proposed environmental noise criteria at LOAEL level, 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.

- $L_{90,T}$   $L_{90}$  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<sub>max</sub> L<sub>max</sub> is the maximum sound pressure level recorded over the period stated. L<sub>max</sub> is sometimes used in assessing environmental noise where occasional loud noises occur, which may have little effect on the L<sub>eq</sub> noise level.

Sound Pressure Level ( $L_p$ ) is the sound pressure relative to a standard reference pressure of 2 x 10<sup>-5</sup> 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).

# Appendix B

# **Planning Policies, Standards & Guidance**

## B.1 BS 4142:2014 + A1:2019

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

The procedure contained in BS 4142:2014 provides an assessment of the likely effects of sound on people when comparing the specific noise levels from the source with representative background noise levels. Where the noise contains "a tone, impulse or other characteristic" then various corrections can be added to the specific (source) noise level to obtain the "rating level".

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.

### **B.2** Statutory Noise Nuisance

S79(1)(g) of the Environmental Protection Act 1990 defines a statutory nuisance as *"noise emitted from a premises so as to be prejudicial to health or a nuisance"*. A duty is placed on the Local Authority to serve an abatement notice under S80 if it becomes satisfied that a statutory nuisance exists.

There is however no quantitative definition/objective method in determining statutory noise nuisance, and as such we are not able to definitively advise or determine on such matters. Noise nuisance is subjective and requires multiple factors to be considered, including but not limited to:

- Straining to hear something is generally considered not a nuisance, however,
- Noise level (of source and relative to background), timing, duration, type of noise, frequency, location, continuous or repetitive, all factor into judging nuisance.

To mitigate against, though not remove entirely, the risk of a statutory noise nuisance, a noise assessment should be undertaken by a Suitably Qualified Acoustician. Adoption of appropriate and relevant industry standards/guides can provide a structured framework for such assessments, improving the credibility of mitigation efforts. It is also important to also recognise that ongoing management (both active and passive) may also be necessary depending on the context of the situation.

Appendix C

**Time History Graphs** 

	15 Shorts Garden & 2-3 Neal's Yard	Lmax
	Position 1	
	$L_{eq}$ , $L_{max}$ and $L_{90}$ Noise Levels	■Leq
	Monday 28 October 2024 to Tuesday 29 October 2024	■L90
100 T		



Date and Time

31993/TH1