

Fielding Court London

ENVIRONMENTAL NOISE SURVEY & PLANT NOISE ASSESSMENT REPORT 20237/PNA1.RevA

For:

Fresson + Tee
1 Sandwich Street
London
WC1H 9PF

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HANN TUCKER ASSOCIATES

Consultants in Acoustics
Noise and Vibration

Head Office

Duke House
1-2 Duke Street
WOKING
Surrey GU21 5BA

Tel : 01483 770595
Fax : 01483 729565

Northern Office

First Floor
346 Deansgate
MANCHESTER
M3 4LY

Tel : 0161 832 7041
Fax : 0161 832 8075

E-mail : Enquiries@hanntucker.co.uk
www.hanntucker.co.uk

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APPENDIX A

Revision No.	Date	Description
A	07/08/2014	Updated to include party wall construction

This report has been prepared by Hann Tucker Associates Limited (HTA) with all reasonable skill, care and diligence in accordance with generally accepted acoustic consultancy principles and the purposes and terms agreed between HTA and our Client. Any information provided by third parties and referred to herein may not have been checked or verified by HTA unless expressly stated otherwise. This document contains confidential and commercially sensitive information and shall not be disclosed to third parties. Any third party relies upon this document at their own risk.

1.0 INTRODUCTION

A new item of building services plant is proposed as part of a refurbishment project at Fielding Court, London WC1.

Accordingly, Hann Tucker Associates have been commissioned to carry out an environmental noise survey and plant noise assessment in order to satisfy the requirements of the Local Authority.

This report presents the survey methodology and findings. The survey data has been used as the basis for acoustic assessment purposes.

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_{10} , L_{90} , L_{eq} and L_{max} environmental noise levels at selected accessible street position, thought to be representative of the noise climate of the nearest affected property.

To measure L_{eq} , L_{90} and L_{max} octave band spectra noise levels for typical daytime and night-time periods at each measurement position in order to obtain a more detailed description of the noise climate.

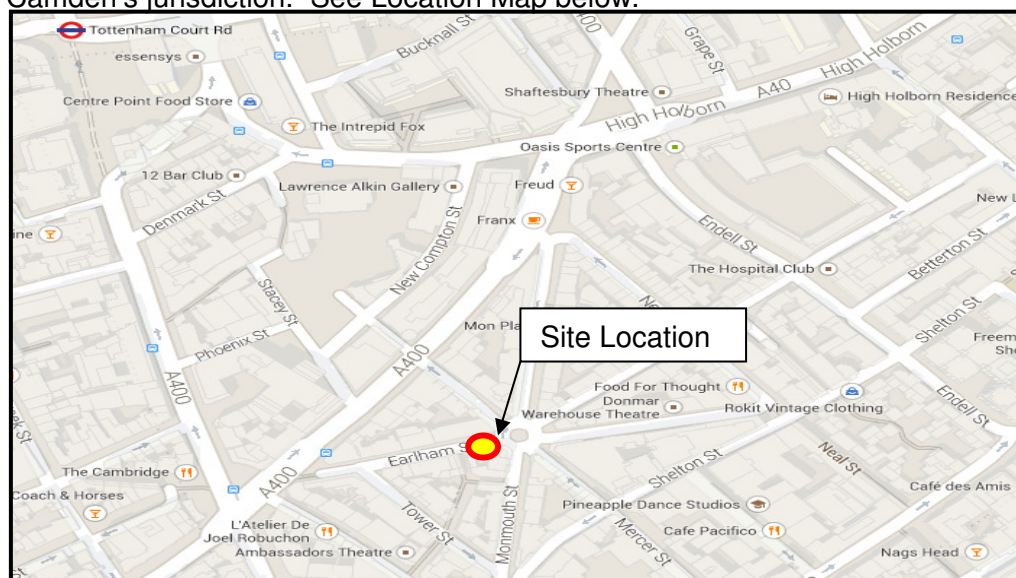
Based on the results of the noise survey, and with reference to the requirements of the Local Authority, to recommend suitable plant noise emission criteria.

To assess the proposed plant and comment on its acceptability.

3.0 SITE DESCRIPTION

3.1 Location

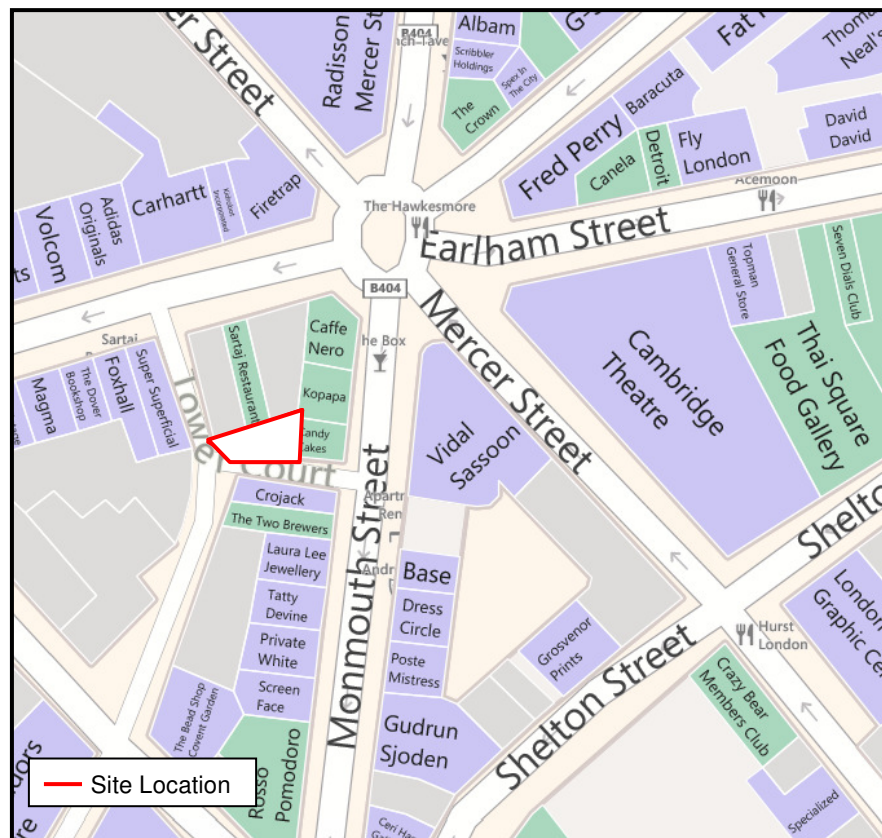
The site is located at Fielding Court and falls within the London Borough of Camden's jurisdiction. See Location Map below.



Location Map (maps.google.co.uk)

3.2 Description

Fielding Court is a 4No. storey residential building and consists of 36 separate flats. The site is bounded by similar sized mixed use buildings and is adjacent to Earlham Street to the north west and Monmouth Street to the east. 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 METHODOLOGY

The survey was undertaken by Greg Barry MSc AMIOA.

5.1 Procedure

Fully automated environmental noise monitoring was undertaken from approximately 11:00 hours on Wednesday 16 April 2014 to 11:00 hours on Thursday 17 April 2014.

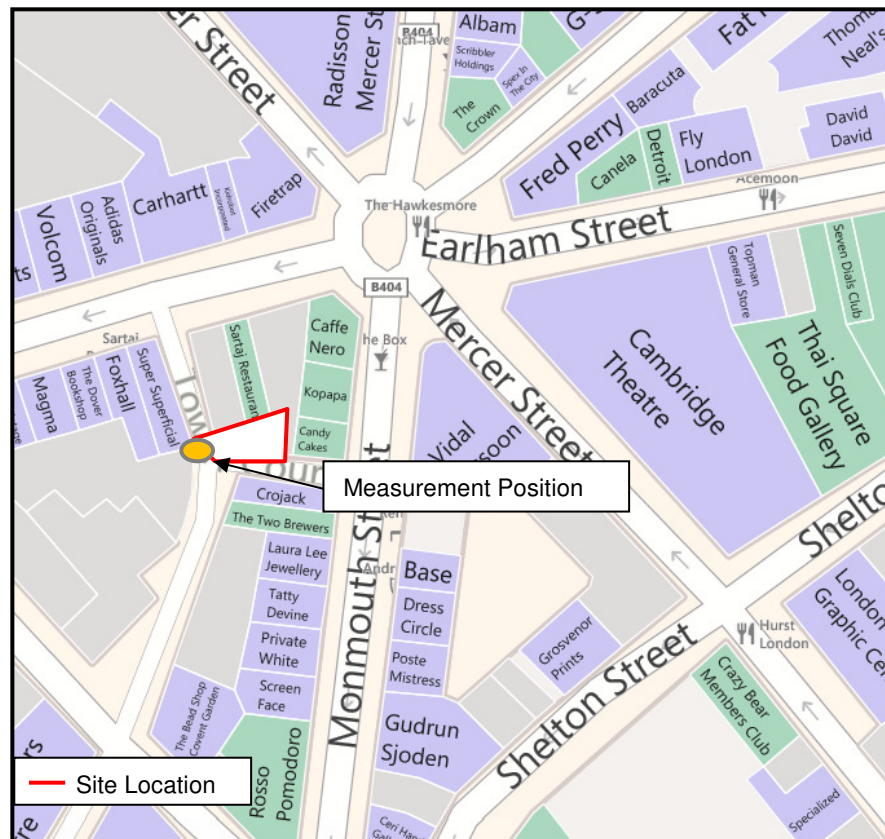
Due to the nature of the survey, i.e. unmanned, it is not possible to accurately comment on the weather conditions throughout the entire survey period. However at the beginning and end of the survey period the wind conditions were calm. The sky was generally clear. We understand that generally throughout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

Measurements were taken continuously of the A-weighted (dBA) L_{10} , L_{90} , L_{eq} and L_{max} sound pressure levels over full 15 minute periods.

5.2 Measurement Position

The noise level measurements were undertaken at 2 Fielding Court. The microphone was situated at 1st floor level and attached to a pole overlooking Tour Court road. The microphone was positioned a distance of 1m from the façade of 2 Fielding Court in a non-free field environment.

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.



Plan Showing Unmanned Measurement Positions (maps.google.co.uk)

5.3 Instrumentation

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

Description	Manufacturer	Type	Serial Number	Latest Verification
Type 1 Data Logging Sound Level Meter	Larson Davis	824	3533	LD calibration on 14/03/2013
Type 1 ½" Condenser Microphone	PCB	377B02	106047	LD calibration on 14/03/2013
Type 1 Calibrator	Larson Davis	CAL200	3082	LD calibration on 21/03/2013

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 0.1dB).

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 Larson Davis windshield.

6.0 RESULTS

The results have been plotted on Time History Graphs 20237/TH1.1 to 20237/TH1.2 enclosed, presenting the 15 minute A-weighted (dBA) L_{10} , L_{90} , L_{eq} and L_{max} levels at each measurement position throughout the duration of the survey.

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 the surrounding road network.

8.0 PLANT NOISE EMISSION CRITERIA

We understand that the requirements of London Borough of Camden for both office and residential properties are as follows:

Noise levels at a point 1 meter external to sensitive facades shall be at least 5dB(a) less than the existing background measurement (L_{A90}), expressed in dB(A) when all plant/ equipment are in operation. Where it is anticipated that any plant/equipment will have a noise that has a distinguishable, discrete continuous note (whine, hiss, screech, hum) and/or if there are distinct impulses (bangs, clicks, clatters, thumps) special attention should be given to reducing the noise levels from that piece of plant/equipment at any sensitive facade to at least 10dB(A) below the L_{A90} , expressed in dB(A)

Based on London Borough of Camden criteria, and the results of the environmental noise survey, we propose the following future plant noise emission criteria to be achieved at 1 metre from the nearest noise sensitive façades:

Plant Noise Emission Criteria $L_{A90(1\text{hour})}$ (dB re 2×10^{-5} Pa) at Nearest Noise Sensitive Façade		
Daytime (07:00-23:00 hours)	Night Time (23:00 –07:00 hours)	24 Hrs
47	42	42

It should be noted that the above plant noise emission limits are subject to approval from the London Borough of Camden.

9.0 PLANT NOISE ASSESSMENT

We understand that the following items of plant are to be installed at Fielding Court.

Plant Description	Location	Qty	Plant Make	Model Number
Heat Pump Outdoor Unit	Ground Floor level Adjacent Tower Court road	3	Toshiba	RAV-SM1403AT-E

9.1 Plant Noise Emissions

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

Plant Description	Sound Power Level (dB re 1×10^{-12} Watts) at 1 metre at Octave Band Centre Frequency (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
RAV-SM1403AT-E	77	72	72	70	66	62	55	47	71

9.2 Location of Plant

The proposed plant is to be located at ground floor level of Fielding Court and will be situated within an opening set back into the façade of Fielding Court (highlighted in red on the drawing below) which is known as the condensation cupboard,



Drawing No. 21599-P02 provided by Fresson and Tee Ltd.

Hann Tucker Associates understands that the nearest noise sensitive window is approximately 5m away at 2 Tower Court. Hann Tucker Associates also understands that the condensation cupboard is proposed to be covered on the front with an acoustic louvre. Please find enclosed our required specifications for acoustic louvres.

9.3 Plant Noise Impact Assessment

The following table presents our calculations relating to the proposed plant installation. The calculations have been carried out on in-house software in order to determine the reverberant sound pressure level within the condensation cupboard. Initial calculations indicated that noise emissions from the proposed plant would exceed the Local Authority criteria. We have therefore had to include acoustic treatment of 2m² of 75mm thick mineral fibre for the condensation cupboard.

	Sound Pressure Level (dB re 2x10 ⁻⁵ Pa) at Octave Band Centre Frequency (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
RAV-SM1403AT-E (Lw)	77	72	72	70	66	62	55	47	71
Reverberant Noise Level (Lp)	85	80	80	77	73	69	62	54	79
Façade Reflection	+3	+3	+3	+3	+3	+3	+3	+3	
Calculated Lp Level at Window (No Acoustic Louvre)	64	59	59	56	52	48	41	33	57
Required SRI of Louvre	-8	-10	-11	-20	-27	-27	-26	-25	
Calculated Lp Level at Window (With Acoustic Louvre)	56	49	48	36	25	21	15	8	41

We understand that the proposed units will be operational for 24 hours. Our calculations indicate that the proposed plant should be capable of achieving the requirements of the Local Authority outlined in Section 8.0.

9.4 Party Wall Construction

The condensation cupboard is located adjacent to a residential property at Fielding Court and is separated by a party wall. In order to mitigate noise intrusion from the proposed plant within the adjacent property a 150mm concrete wall with an independent wall lining on the residential side is proposed.

10.0 CONCLUSIONS

A detailed 24 hour daytime and night-time fully automated environmental noise survey has been undertaken in order to establish the currently prevailing street level environmental noise climate around the site.

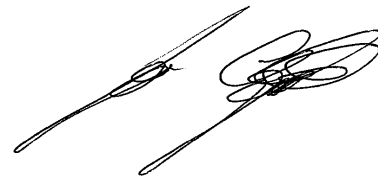
Plant noise emission criteria have been recommended based on the results of the noise survey and with reference to the requirements of the Local Authority.

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 window.



Prepared by
Greg Barry
Consultant
HANN TUCKER ASSOCIATES



Checked by
John Gibbs
Director
HANN TUCKER ASSOCIATES

Appendix A

The acoustic terms used in this report are as follows:

dB : Decibel - Used as a measurement of sound pressure level. It is the logarithmic ratio of the noise being assessed to a standard reference level.

dBA : The human ear is more susceptible to mid-frequency noise than the high and low frequencies. To take account of this when measuring noise, the 'A' weighting scale is used so that the measured noise corresponds roughly to the overall level of noise that is discerned by the average human. It is also possible to calculate the 'A' weighted noise level by applying certain corrections to an un-weighted spectrum. The measured or calculated 'A' weighted noise level is known as the dBA level.

Because of being a logarithmic scale noise 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.

L₁₀ & L₉₀: If a non-steady noise is to be described it is necessary to know both its level and the degree of fluctuation. The L_n indices are used for this purpose, and the term refers to the level exceeded for n% of the time, hence L₁₀ is the level exceeded for 10% of the time and as such can be regarded as the 'average maximum level'. Similarly, L₉₀ is the average minimum level and is often used to describe the background noise.

It is common practice to use the L₁₀ index to describe traffic noise, as being a high average, it takes into account the increased annoyance that results from the non-steady nature of traffic noise.

L_{eq} : The concept of L_{eq} (equivalent continuous sound level) has up to recently been primarily used in assessing noise in industry but seems now to be finding use in defining many other types of noise, such as aircraft noise, environmental noise and construction noise.

L_{eq} is defined as a notional steady sound level which, over a stated period of time, would contain the same amount of acoustical energy as the actual, fluctuating sound measured over that period (e.g. 1 hour).

The use of digital technology in sound level meters now makes the measurement of L_{eq} very straightforward.

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.

FIELDING COURT

ACOUSTIC SPECIFICATION FOR

ACOUSTIC LOUVRE SCREENING

Acoustic louvre screening shall extend:

- continuously around the front of the plant area.

The louvre blades shall face in the direction opposite to that which would be conventional for weather louvers, such that the plant is not visible between the louvre blades when viewed from below.

Performance

The acoustic louvres shall be at least 300mm deep and provide, in their as-installed condition, the following minimum combined sound reduction indices (SRI's)/Transmission Losses when tested in accordance with BS EN ISO 10140-2:2010:

Minimum Sound Reduction Index (dB) at Octave Band Centre Frequency (Hz)							
63	125	250	500	1k	2k	4k	8k
8	10	11	20	27	27	26	25

Construction

The louvre frame shall be constructed from a suitable gauge of galvanised mild steel, or aluminium, supporting louvre blades of like material. The acoustic material in the blades shall be packed to a density of not less than 45kg/m³ and be inert, rot and vermin proof, non-hygroscopic incombustible mineral fibre. This shall be faced with glass fibre cloth, or other approved infill protection membrane, and retained on the lower blade face by perforated galvanised mild steel or aluminium (not "expamet" or similar derivative) having a minimum thickness of 0.5mm fixed at 200mm (max) centres.

All junctions between the acoustic screen and adjacent structures shall be made good and sealed with a heavy grout and/or non-hardening dense mastic.

The supplier shall ensure that the assembled enclosure is designed and constructed to withstand site operating conditions such as wind and snow loads, etc., as appropriate, and is suitably weatherproofed.

The acoustic media shall not comprise materials which are generally composed of mineral fibres, either man made or naturally occurring, which have a diameter of 3 microns or less and a length of 200 microns or less or which contain any fibres not sealed or otherwise stabilised to ensure that fibre migration is prevented.

Any deviations from the above specification must be agreed by, and confirmed in writing to, Hann Tucker Associates.