5 Ella Mews
NW3 2NH
London

Environmental Noise Survey and Plant Noise Assessment Report

23519/PNA1 Rev1

3 August 2016

For:
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Hann Tucker Associates

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Document Control

Rev	Date	Comment	Prepared by	Authorised by
0	29/07/2016	-	James Mackenzie Assistant Consultant BSc(Hons), MA, AMIOA	John Gibbs Director MIOA, MSEE, CEnv
1	03/08/2016	Minor corrections to address and Sections 3.2 and 8.0		
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Attachments

1.0 Introduction

New items of plant are proposed to be installed at 5 Ella Mews. Hann tucker Associates have therefore been commissioned to undertake an environmental noise survey to provide a basis for assessment of the environmental plant noise emissions for planning purposes.

This report presents the survey methodology and findings.

2.0 Objectives

To establish, by means of detailed 24 hour daytime and night-time fully manned automated environmental noise monitoring, the existing A-weighted (dBA) L_{90}, L_{eq} and L_{max} environmental noise levels at an accessible roof level position at the site, thought to be representative 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 in conjunction with the Local Authority, to recommend suitable plant noise emission criteria.

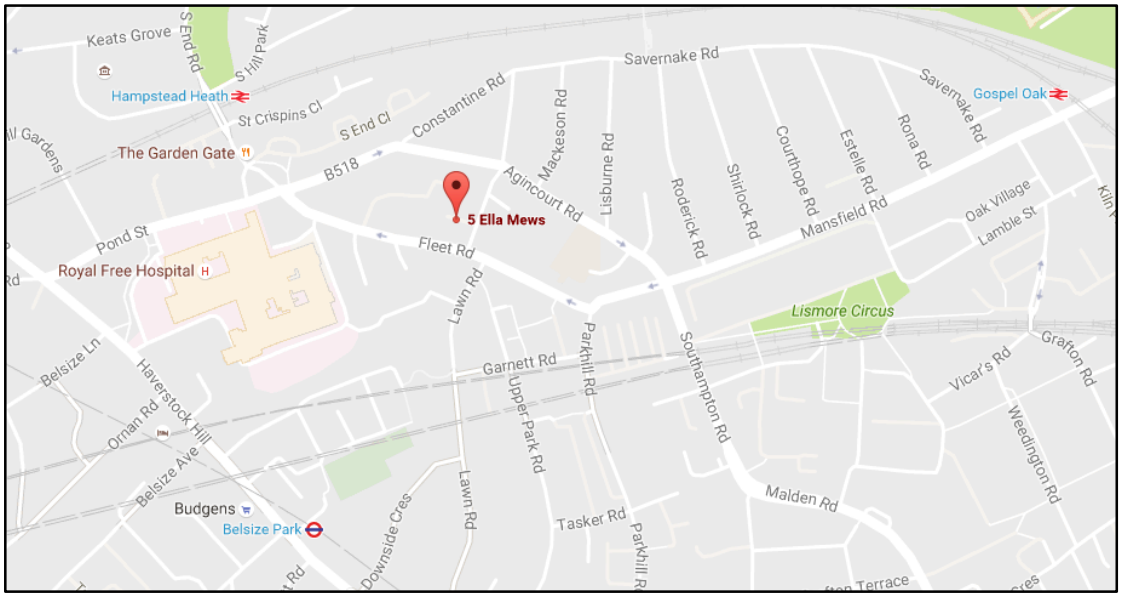
To assess the proposed plant and comment on its acceptability.

These objectives are as set out in our Outline Brief dated 21 July 2016 and SF Studios London's written instructions received on 22 July 2016.

3.0 Site Description

3.1 Location

The site is located at 5 Ella Mews, London, NW3 2NH and falls within the London Borough of Camden's jurisdiction. See Location Map below.



Location Map (Map data - ©2016 Google)

3.2 Description

The site is located at 5 Ella Mews, situated just off Cressy Road. It is a ground and lower ground floor unit adjoined by ground plus 1 storey office buildings to the west and east. The majority of the wider surrounding area is mixed use with a number of commercial businesses and residential. The subjective dominant noise sources around the site were noted to be road traffic noise from nearby Cressy Road and Fleet road and noise from the existing plant on the roof of the site. See Site Plan below.

Site Plan (Imagery © 2016 Bluesky, DigitalGlobe, Getmapping plc, Infoterra Ltd & Bluesky, Map Data © 2016 Google.)

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 James Mackenzie BSc(Hons) MA AMIOA.

5.1 Procedure

Fully automated environmental noise monitoring was undertaken from approximately 10:00 hours on 26 July 2016 until 10:00 hours on 27 July 2016.

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 and the sky was generally patchy cloud. We understand that generally throughout the survey period the weather conditions were consistent with this. 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 over 15 minute periods.

5.2 Measurement Position

The noise level measurements were undertaken at a single position at first floor level on the roof of 5 Ella Mews. The Microphone was attached to a pole connected to the cage surrounding the neighbouring property's window approximately 6m above ground level. The microphone was less than 1m meter from the façade and therefore the presented data includes façade reflections.

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 Position (Imagery © 2016 Bluesky, DigitalGlobe, Getmapping plc, Infoterra Ltd & Bluesky, Map Data © 2015 Google.)

5.3 Instrumentation

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

Description	Manufacturer	Type	Serial Number	Calibration
Type 1 Precision Sound Level Meter	Larson Davis	824	3804	calibration on 05/05/2016
Type 1 Calibrator	Larson Davis	CAL200	3802	calibration on 09/06/2016

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 Graph 23519/TH1 enclosed, presenting the 15 minute A-weighted (dBA) L_{90}, L_{eq} and L_{max} levels at the measurement position throughout the

duration of the survey.

The daytime $L_{Aeq(16\text{-}hour)}$ and night-time $L_{Aeq(8\text{-}hour)}$ noise levels for the position are presented in the table below.

Daytime $L_{Aeq(16\text{-}hour)}$	**Night-Time $_{(LAeq(8\text{-}hour)}$**
52dBA	46dBA

The following table presents the lowest measured L_{A90} background noise levels during the survey:

Lowest 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**
46dBA	44dBA

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 light road traffic noise from nearby Cressy Road and Fleet road, along with noise from the existing plant located on the roof of 5 Ella Mews.

8.0 Plant Noise Emission Criteria

The site lies within the London borough of Camden's jurisdiction. Their advice regarding criteria for atmospheric noise emissions from building service plant is as follows:

"*Noise levels at a point 1 metre 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 façade to at least 10dB(A) below the L_{A90}, expressed in dB(A)".*

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 with all plant operating simultaneously.

Plant Noise Emission Criteria (dB re $2x10^{-5}$ Pa)	
Daytime (07:00 – 23:00 hours)	**Night-time (23:00 – 07:00 hours)**
41dBA	39dBA

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 Local Authority.

9.0 Plant Noise Assessment

We understand that the following items of plant are to be installed at 5 Ella Mews:

Plant Description	Location	Qty	Plant Make	Model Number
AC Unit 1	Flat Roof of 5 Ella Mews	1	Mitsubishi	FDU140VF
AC Unit 2	Flat Roof of 5 Ella Mews	1	Mitsubishi	SCM80ZM-S

9.1 Plant Noise Emissions

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

Plant Description	Sound Pressure Level (dB re $2x10^{-5}$ Pa) at 1 metre at Octave Band Centre Frequency (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
AC Unit 1*	55	53	51	53	45	41	32	28	52
AC Unit 2*	57	55	53	55	47	43	34	30	54

*Manufacturers single figure noise data fitted to a typical octave band spectrum.

9.2 Location of Plant

Both items of plant are to be located on the flat roof of 5 Ella Mews concealed by the gable parapet. The closest noise sensitive window is located approximately 2.5m away at 4 Ella Mews.

9.3 Plant Noise Impact Assessment

The following table presents our calculations relating to the proposed plant installation.

	Sound Pressure Level (dB re $2x10^{-5}$ Pa) at Octave Band Centre Frequency (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
Cumulative level of all plant items	59	57	55	57	49	45	36	32	56
Hemispherical Conformal Area Distance Loss (2.5m)	-5	-5	-5	-5	-5	-5	-5	-5	
Calculated Noise Level at Window	54	52	50	52	44	40	31	27	51

We understand that the proposed units will be operational during daytime and night-time hours. Our calculations indicate that the proposed plant exceeds criteria outlined in Section 8.0 and will therefore require some attenuation in order to meet the requirements of the Local Authority.

9.4 Mitigation Measures

In order to bring the proposed installations into compliance with the proposed criterion, we would recommend installing the plant in an acoustic enclosure offering at least 12dBA. Please see our attached our Specification for Small Acoustic Enclosures and suitable suppliers.

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 roof level environmental noise climate around the site.

Plant noise emission criteria have been recommended based on the results of the noise survey and in conjunction with 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 will require attenuation in order to meet the requirements of the Local Authority at the nearest noise sensitive 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_{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).

5 ELLA MEWS

SPECIFICATION FOR

SMALL ACOUSTIC ENCLOSURES

The two AC Units shall be supplied complete with acoustic treatment which shall achieve adequate levels of attenuation to ensure that the following limiting sound pressure levels are not exceeded at 1m (free field over a reflecting plane) from the enclosure in any horizontal or vertical direction under any load conditions.

Duty/Time	**A-weighted Limiting Sound Pressure Level @ 1m (dB re 2 x 10^{-5} Pa)**
Day 07:00 – 23:00 hours	43
Night – 23:00 – 07:00 hours	41

Furthermore they shall not exhibit any significant tonal content.

Exceedances in excess of the measurement tolerance for a Type 1 sound level meter shall constitute a failure.

The enclosed outer panels shall be constructed from galvanized sheet steel having a minimum thickness of 1.6mm and fixed at 300mm (max) centres. The enclosure inner panels shall be constructed from punch-perforated (round-hole) galvanised sheet steel facing, having a minimum thickness of 0.7mm fixed at 300mm (max) centres. Flattened-expanded (“Expamet”) sheet shall not be used, unless all edges of the sheet are mechanically fixed to the panel casing and galvanised steel cover strips are used to prevent rivet heads pulling through the perforated sheet (trapping the Expamet between two solid steel layers).

The inert, rot and vermin proof, non-hygroscopic and non-combustible mineral wool or glass fibre acoustic medium shall be packed to a density of not less than 48kg/$m^{3.}$ This shall be faced with a glass fibre cloth, or other approved infill protection membrane. Panels shall be constructed and assembled so that no egress of the acoustic medium will occur under the operating conditions.

Doors, access panels, windows and ventilation ducts or electrical cable penetrations hall be treated so as to maintain the specified acoustic insulation of the assembled enclosure.

Demountable sections shall be designed to allow easy disassembly and reassembly by unskilled personnel without affecting the acoustic performance.

The supplier shall ensure that the assembled enclosure is designed and constructed to withstand site operating conditions such as wind and snow loads, roof mounted plant, etc., as appropriate, and if outside, to be 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.

SUITABLE SUPPLIERS

Of

ACOUSTIC ENCLOSURES FOR SMALL AIR CONDITIONING UNITS

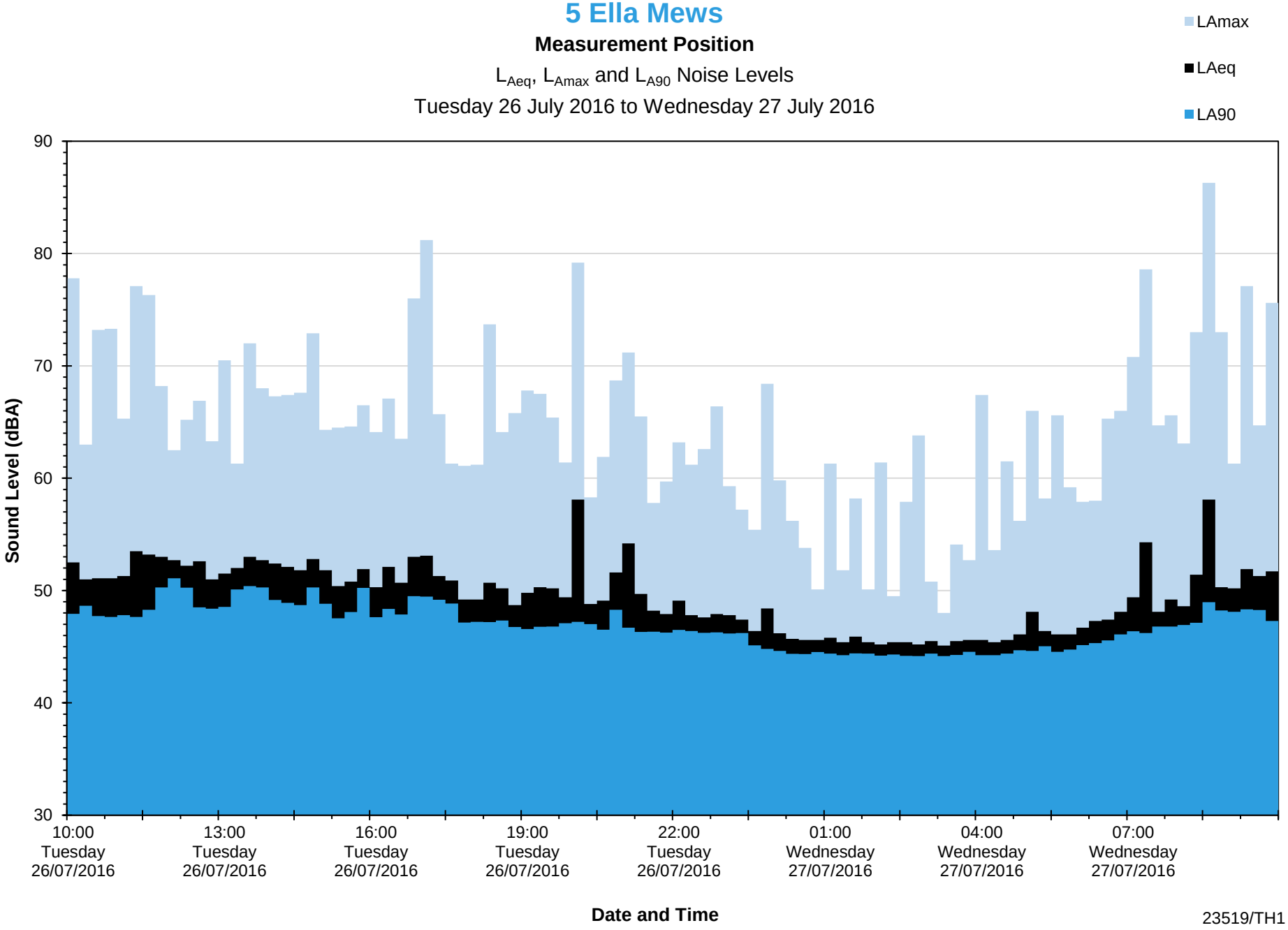
Name & Address	Telephone Number	Contact
Environ Technologies Ltd Regus House 1010 Cambourne Business Park Cambourne CB3 6DP	0870 383 3344	Steve Cox
Acoustic Engineering Services Ltd 78 High Road Byfleet Surrey KT14 7QW	01932 352733	Barry Austin Mark Stagg

5 Ella Mews

Measurement Position

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

Tuesday 26 July 2016 to Wednesday 27 July 2016



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