Thomas Neal's Centre London

Environmental Noise Survey and Plant Noise Assessment Report

23266/PNA1

9 May 2016

For:

SPPM
6 Kingly Street
London
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Hann Tucker Associates
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Document Control

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0	09/05/2016	-		
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1.0 Introduction

As part of a new fit out, building services plant is proposed to be installed at Thomas Neal's Centre, London.

Hann Tucker Associates have therefore been commissioned to undertake a detailed environmental noise survey of the site and to assess the likely impact of the proposed plant in line with the planning requirements of the Local Authority.

This report presents the survey methodology and findings.

2.0 Objectives

To establish, by means of detailed 7 day 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 at the site, thought to be representative of the nearest affected property.

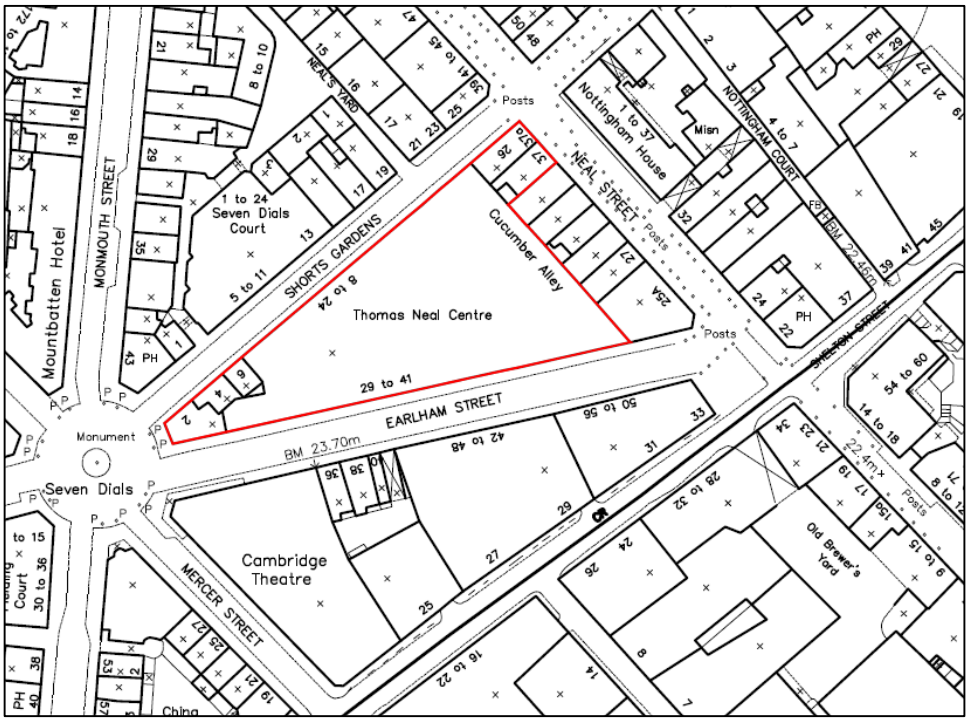
Based on the results of the noise survey, and in conjunction with the Local Authority, to recommend suitable plant noise emission criteria.

To assess the proposed plant and comment on its acceptability.

3.0 Site Description

3.1 Location

The site is located at the Thomas Neal's Centre and falls within the London Borough of Camden. See Location Map below.



Location Map (Rolfe Judd)

3.2 Description

Thomas Neal's Centre is located to the east of Seven Dials. The site is made up largely of retail units across basement, ground and first floor levels. The upper floors are of mixed use including some residential dwellings.

The site is bound to the north by Shorts Gardens, to the south by Earlham Street and to the west by Neal Street. The site is built around a central atrium. The proposed plant is to be installed on the atrium roof around which the surrounding building forms a central light well.

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 Gareth Evans BSc (Hons).

5.1 Procedure

Fully automated environmental noise monitoring was undertaken from approximately 15.30 hours on Friday 29 April 2016 until 15.30 hours on Friday 6 May 2016.

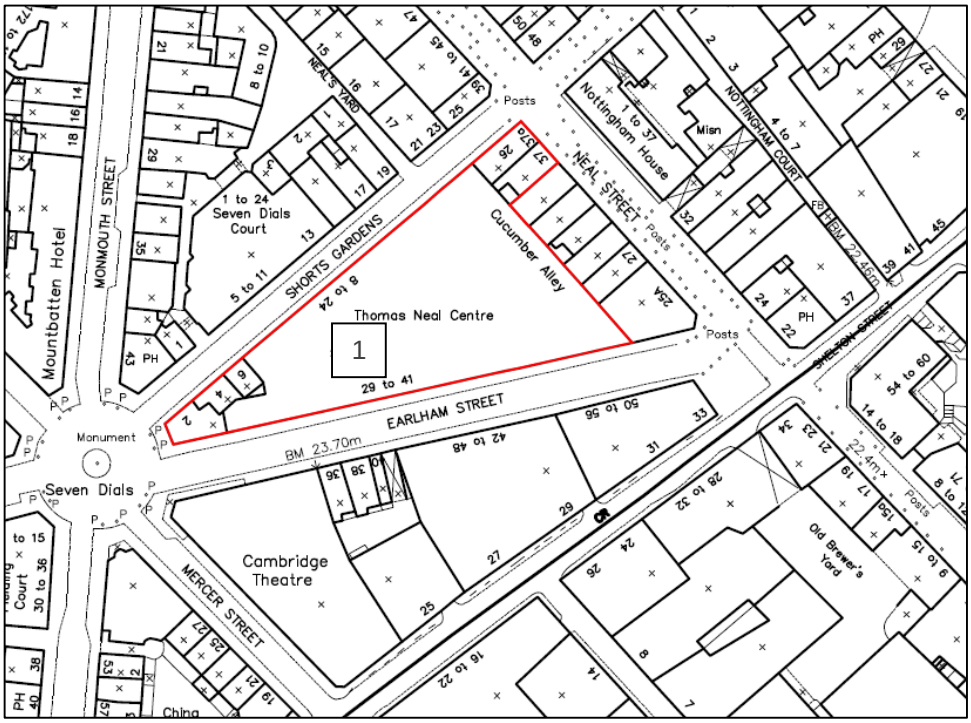
Due to the nature of the survey, i.e. unmanned, it is not possible to accurately comment on the weather conditions throughout the entire survey period. However at the beginning and end of the survey period the wind conditions were calm. The sky was generally clear. We understand that generally throughout 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_{90}, L_{eq} and L_{max} sound pressure levels over 15 minute periods.

5.2 Measurement Position

The noise level measurements were undertaken at position 1No. position on-site. The sound level meter was located on the atrium roof to the south of the central light-well within the Thomas Neal's Centre.

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 Manned Measurement Position (Rolfe Judd)

5.3 Instrumentation

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

Description	Manufacturer	Type	Serial Number	Calibration
Position 1 Type 1 Data Logging Sound Level Meter	Larson Davis	824	3838	LD calibration on 30/10/2014
Position 1 Type 1 ½" Condenser Microphone	Larson Davis	377B02	LW132146	LD calibration on 30/10/2014
Type 1 Calibrator	Larson Davis	CAL200	3082	LD calibration on 09/04/2015

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 Larson Davis windshield.

6.0 Results

The results have been plotted on Time History Graph 23266/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 surveys.

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

Position	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	24 Hours
1	42dBA	41dBA	41dBA

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 nearby construction work and distant road traffic noise.

8.0 Plant Noise Emission Criteria

The site falls within Camden Borough Council's jurisdiction. We understand Camden Council's requirements with regards to plant noise emissions to be as follows:

"Noise levels at a point 1 metre external to sensitive façades 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)."

Based on the above requirements, and the results of the environmental noise survey, the following future plant noise emission criteria should be achieved at 1 metre from the nearest noise sensitive façade based on the minimum measured L_{A90} noise level.

Plant Noise Emission Criteria (dB re 2 x 10^{-5} Pa)		
Daytime (07:00 – 23:00) Hours	**Night-Time (23:00 – 07:00) Hours**	**24 Hours**
37dBA	36dBA	36dBA

These criteria are subject to approval by Camden Borough Council.

9.0 Plant Noise Assessment

We understand that the following item of plant is to be installed at

Plant Description	Location	Qty	Plant Make	Model Number
Management office heat pump	Atrium roof	1	Mitsubishi	MXZ-2D53VA

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	
Management office heat pump	57	58	54	51	48	44	37	29	53

9.2 Location of Plant

The proposed plant is to be located on the atrium roof within the central light well area of the Thomas Neal's Centre. Immediately above the proposed plant location are residential windows at a distance of approximately 2 metres.

9.3 Proposed Hours of Operation

The proposed plant will be serving the management office. As such, we understand that the plant could run up to 24 hours a day.

9.4 Mitigation Measures

In order that the proposed plant be capable of achieving the minimum requirements of the Local Authority, we would recommend that the plant be installed within a full acoustic enclosure capable of reducing the proposed units limiting sound pressure level to 35dBA when measured at 1 metre in any direction on site.

Please find attached our acoustic enclosure specification.

9.5 Plant Noise Impact Assessment

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

	Sound Pressure Level (dB re 2 x 10^{-5} Pa)
Management office heat pump installed with full acoustic enclosure as per Hann Tucker Specification	35dBA
Distance Loss	-2dBA
Façade Correction	+3dBA
Resultant Noise Level	36dBA

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

10.0 Conclusions

A detailed 7 day fully automated environmental noise survey has been undertaken in order to establish the currently prevailing 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 should be capable of achieving the requirements of the Local Authority at the nearest noise sensitive residential window with the specified mitigation measures.

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).

Thomas Neal's Centre, London

Specification for

Acoustic enclosure

The management office heat pump 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 direction under any load conditions.

Duty/Time	A-weighted Limiting Sound Pressure Level at 1m (dB re 2 x 10^{-5} Pa)
24 hour	35

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.

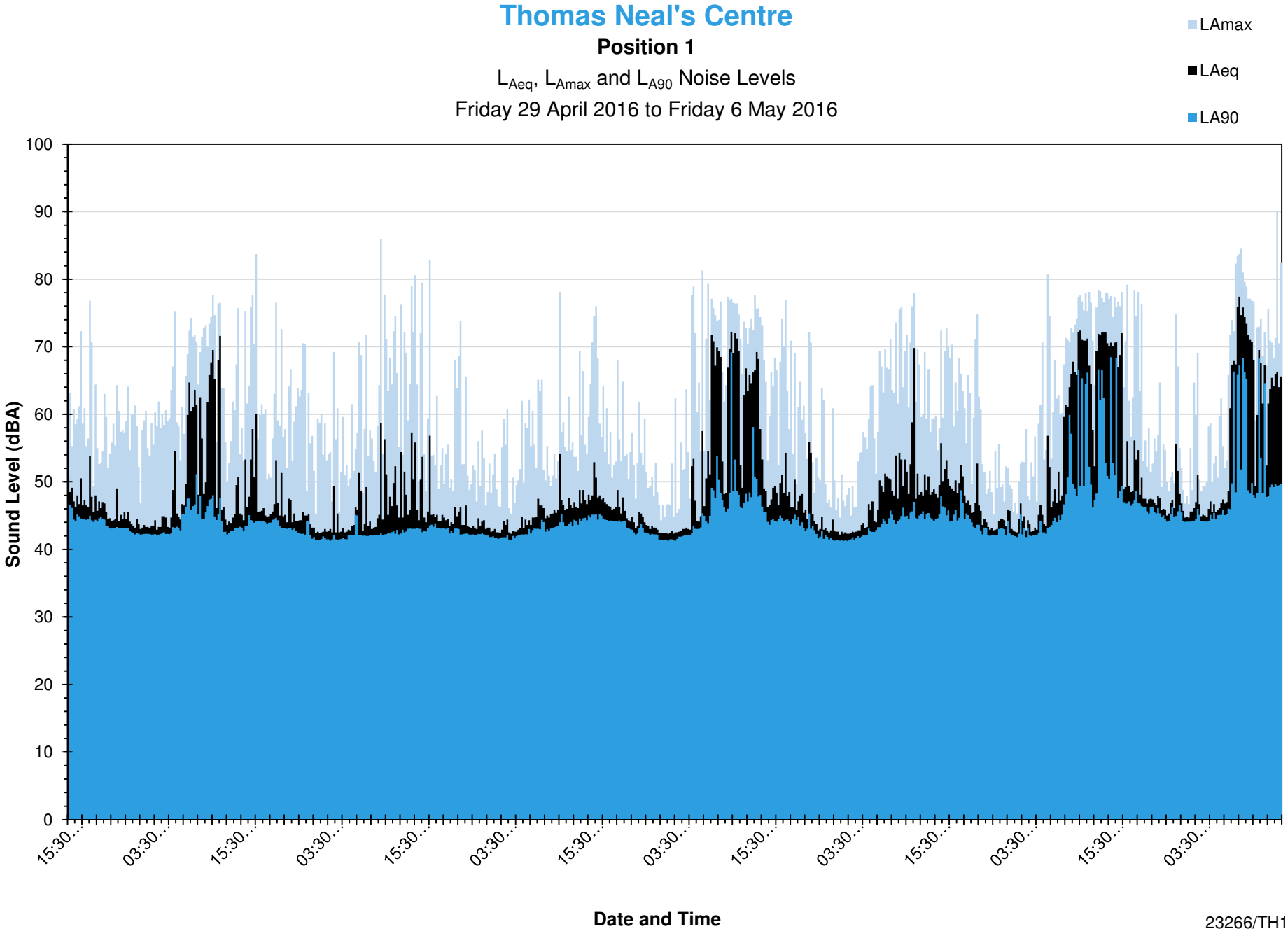
Any deviations from the above specification must be agreed by, and confirmed in writing to, Hann Tucker Associates.

Thomas Neal's Centre

Position 1

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

Friday 29 April 2016 to Friday 6 May 2016



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