

**Panther House and  
156-164 Gray's Inn Road  
London**

ENVIRONMENTAL NOISE SURVEY  
AND NOISE IMPACT ASSESSMENT  
REPORT 22233/NIA1

For :  
Dukelease Properties  
22 Old Bond Street  
London  
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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**

156-164 Grays Inn Road and Panther House are proposed to undergo redevelopment to a mixed use residential and commercial premises. Hann Tucker Associates have been appointed to undertake an environmental noise survey to establish the existing noise levels around the site in order to assess compliance with the Local authority's requirements.

This report presents the survey methodology and findings. The survey data has been used as the basis for various acoustic design and assessment purposes in the context of the National Planning Policy Framework (NPPF).

## **2.0 OBJECTIVES**

To establish by means of a detailed survey of at least 24 hours the existing LA<sub>max</sub>; LA<sub>eq</sub> and LA<sub>90</sub> environmental road, rail and air traffic noise levels at up to two secure on-site positions, using fully computerised unmanned monitoring equipment.

The sets of noise data will be presented with recommendations made for daytime and night-time plant noise emission limits, following liaison with the Local Authority.

The report will also identify incident traffic noise levels to be used in subsequent analysis to establish sound performance specifications for the preliminary external building fabric elements.

Based upon the results of the noise survey data, and guidance of the NPPF undertake a noise assessment to assess the suitability of the proposed development for residential use.

## **3.0 SITE DESCRIPTION**

### **3.1 Location**

The site is located between Grays Inn Road and Mount Pleasant, and falls within London borough of Camden's jurisdiction. See location map below.



Location Map (Imagery © 2015 Google)

### 3.2 Description

The existing site comprises mixed commercial and retail property. Directly to the north and east is predominantly residential property, to the south and west is mixed residential, commercial and retail.

The site currently comprises three to six storey buildings. Many of the adjacent properties extend taller than 6 storeys.

## 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 Adam Kershaw BSc(Hons) MIOA.

### 5.1 Procedure

Fully automated environmental noise monitoring was undertaken from approximately 15:30 hours on 22 July 2015 to 15:30 hours on 23 July 2015.

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 clear. We understand that generally throughout the survey period the weather conditions were suitable for undertaking an environmental noise survey.

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

## 5.2 Measurement Positions

The noise level measurements were undertaken at 2 positions around the development site. The measurement positions are described in the table below.

Position No	Description
1	The sound level meter was installed at the 1st floor office level. The microphone was attached to a pole which protruded out of a first floor windows overlooking Gray's Inn Road.
2	The sound level meter was installed at 4th floor roof level. The microphone was attached to a pole which protruded over the edge of the building overlooking Mount Pleasant.

The approximate measurement positions are shown on the plan below.



Plan Showing Unmanned Measurement Positions (Imagery © 2015 Google)

### 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	3803	LD calibration on 10/02/2015
Position 1 Type 1 ½" Condenser Microphone	Brüel and Kjær	4189	2470596	LD calibration on 10/02/2015
Position 2 Type 1 Data Logging Sound Level Meter	Larson Davis	824	3542	LD calibration on 20/03/2014
Position 2 Type 1 ½" Condenser Microphone	PCB	377B02	104675	LD calibration on 20/03/2014
Type 1 Calibrator	Larson Davis	CAL200		LD calibration on

Each 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 0.1 dB).

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

## 6.0 RESULTS

The results have been plotted on Time History Graphs 22233/TH1 to 22233/TH4 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.

### 6.1 $L_{eq}$ Noise Levels

In order to compare the results of our survey with suitable guidelines it is necessary to convert the measured  $L_{Aeq(15\text{ minute})}$  noise levels into single figure daytime  $L_{Aeq(16\text{-hour})}$  (07:00-23:00 hours) and night-time  $L_{Aeq(8\text{-hour})}$  (23:00-07:00 hours) levels.

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

Position	Daytime $L_{Aeq(16\text{-hour})}$	Night-Time $L_{Aeq(8\text{-hour})}$
1	67dB	65dB
2	53dB	45dB

Note- The above levels have been corrected for façade reflections where appropriate, for comparison with the free field levels.

## 6.2 Incident Noise Levels

The following table presents the typical worst case incident noise levels for each façade (with suitable corrections made for façade reflections). The data may be used in subsequent analysis to establish sound performance specifications for each of the external building fabric elements.

Position	Description	L <sub>eq</sub> Sound Pressure Level (dB) @ Octave Band Centre Frequency (Hz)								dBA
		63	125	250	500	1k	2k	4k	8k	
1 - Front	Typical Daytime L <sub>eq</sub> (07:00 – 23:00)	75	67	64	62	64	60	53	44	67
1 - Front	Typical Night-time L <sub>eq</sub> (23:00 - 07:00)	70	63	60	59	62	58	50	40	65
2 - Rear	Typical Daytime L <sub>eq</sub> (07:00 – 23:00)	62	56	52	51	48	44	38	29	53
2 - Rear	Typical Night-time L <sub>eq</sub> (23:00 - 07:00)	55	47	45	42	40	34	25	19	45

Note - The above levels have been corrected for façade reflections.

## 6.3 Background noise levels

The following table presents the lowest measured L<sub>A90</sub> background noise levels during the survey:

Position	Lowest measured L <sub>A90</sub> background noise level(dB re 2.0 x 10 <sup>-5</sup> Pa)	
	Daytime (07:00-23:00)	Night-Time (23:00 – 07:00)
1	59 dBA	46 dBA
2	47 dBA	44 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 road traffic noise.

## 8.0 PLANNING POLICY/GUIDANCE

### 8.1 National Planning Policy Framework (NPPF)

The following paragraph is from the NPPF:

“123.Planning policies and decisions should aim to:

- avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development;

- mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions;
- recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established; and
- identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.”

## 8.2 Local Development Plan

Table A in Appendix 1 of the Camden Unitary Development Plan presents noise levels at residential sites adjoining road at which planning permission will not be granted. See below.

Noise description and location of measurement	Period	Time	Sites adjoining roads
Noise at 1 metre external to a sensitive façade	Day	07:00 – 19:00	72 dB L <sub>Aeq,12h</sub>
Noise at 1 metre external to a sensitive façade	Evening	19:00 – 23:00	72 dB L <sub>Aeq,4h</sub>
Noise at 1 metre external to a sensitive façade	Night	23:00 – 07:00	66 dB L <sub>Aeq,8h</sub>

## 8.3 BS8233

There are no criteria in current Building Regulations concerning external noise intrusion. We also understand the Planning Authority have not imposed any noise criteria for external noise intrusion in residential or commercial properties. Therefore, there are no statutory requirements for controlling external noise intrusion on this project. We would be pleased to advise on the external building fabric of the commercial/retail units at the detailed design stage.

These guidelines are entirely discretionary but for residential dwellings we would advise in favour of British Standard 8233: 2014 “Guidance on sound insulation and noise reduction for buildings”, which states that it is desirable that internal ambient noise levels do not exceed the following guideline values:

Activity	Location	Desirable Internal Ambient Criteria	
		07:00 – 23:00	23:00 to 07:00
Resting	Living Rooms	35 dB L <sub>Aeq,16hour</sub>	-
Dining	Dining Room/Area	40 dB L <sub>Aeq,16hour</sub>	-
Sleeping (Daytime Resting)	Bedroom	35 dB L <sub>Aeq,16hour</sub>	30 dB L <sub>Aeq,8hour</sub>



## 9.0 ACHIEVABLE INTERNAL NOISE LEVELS

We have predicted the levels that would be achievable in the worst-case dwelling closest to the dominant traffic noise source of Gray's Inn Road.

Annex 6 of PPG24 states the following:

*The following table indicates "Typical noise reduction of a dwelling façade with windows set in brick/block wall."*

Difference Between External and Internal Noise Levels			
Noise Source	Single Glazing	Thermal Double Glazing	Secondary Glazing
Road Traffic	28dBA	33dBA	34dBA
Civil Aircraft	27dBA	32dBA	35dBA
Military Aircraft	29dBA	35dBA	39dBA
Diesel Train	28dBA	32dBA	35dBA
Electric Train	30dBA	36dBA	41dBA

A simple assessment made by deducting the value indicated above for road traffic from the measurement values detailed in Section 6.1, indicates the following noise levels would be expected within the proposed worst case dwellings with thermal double glazing.

Daytime $L_{Aeq(16\text{-hour})}$	Night-Time $L_{Aeq(8\text{-hour})}$
34dBA	32dBA

Note this simple assessment considers residential dwellings only located at our worst case measurement Position 1. These predicted worst case internal noise levels meet the proposed daytime but not the desired night-time criteria.

However, it should be noted that worst case residential dwellings are only proposed to be at 2nd floor level, and their facades would be set back from the road by some amenity/communal entrance space. The building edge will likely have a wall or balustrade, we would expect this additional height from the measurement position and the distance setback will offer suitable additional screening, and thus suitable internal noise levels should be comfortably achievable.

Further mitigation measures can be considered and incorporated at detailed design phase.

## 10.0 MITIGATION MEASURES

Provision exists to provide additional sound insulation as required. The following noise mitigation measures could be proposed:

- The external envelope of the proposed residences can incorporate suitably specified glazing, so as to achieve the proposed criteria summarised above.
- The dwellings could be provided with whole house ventilation systems. Where ventilation would be provided through the façade it would be suitably acoustically attenuated to ensure the achievement of the proposed internal noise criteria would not be compromised.
- In order to comply with Building Regulations (Part F), it is necessary to provide background trickle ventilation to habitable rooms (living rooms and bedrooms). The acoustic performance of which should be assessed during detailed design stage.

At this stage of the design scheme the precise types of window to be used is not known. Nor have selections of acoustic vents been made.

The Local Planning Authority could expect to be provided with details of the sound insulation treatments when available. Therefore in granting consent it could be appropriate for planning condition(s) to be imposed along the following lines:

*“Construction work shall not begin until a scheme for protecting the dwellings against noise from [ ] has been submitted to and approved by the Local Planning Authority; for each applicable dwelling all works which form part of the scheme for that dwelling shall be completed before the dwelling is occupied.”*

## 11.0 PLANT NOISE EMISSION CRITERIA

Items of building services plant will be required as part of the proposed development. Whilst at this stage there are no Planning Conditions relating to plant noise emissions, these items of plant should comply with the requirements of Camden Council; which are 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 (LA90), 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 LA90, expressed in dB(A).”*

On the basis of the above and the survey results we propose the following plant noise emissions limit to be achieved at 1m from the façades of the nearest neighbouring noise sensitive facades:

Position	Plant Noise Emission Criteria (dBA re 2x10 <sup>-5</sup> Pa)		
	Daytime (07:00 – 23:00 hours)	Night-Time (23:00 – 07:00 hours)	24 Hours
1	49	36	36
2	37	34	34

It should be noted that the above plant noise emission limits are subject to planning condition approval by Camden Borough Council.

## 12.0 CONCLUSIONS

A detailed environmental noise survey has been undertaken in order to establish the currently prevailing environmental noise climate around the site.

Appropriate internal noise criteria has been proposed in line with the requirements of the Local Authority and NPPF, which we have demonstrated should be achievable using conventional constructions.

Plant noise emission criteria have been recommended based on the results of the noise survey and in conjunction with the Local Authority.

Typical incident traffic noise levels for the worst effected façades of the proposed development have been specified based on the results on the noise survey data.

The environmental noise impact upon the proposed dwellings has been assessed in the context of the NPPF. Mitigation advice has been recommended to reduce to a suitable level the adverse impact on health and quality life arising from environmental noise.

Based upon the results of our survey and subsequent assessment we would suggest the proposed development should be considered compliant with suitable acoustic requirements for residential use.

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## APPENDIX A

The acoustic terms used in this report are explained below:

**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.

**L<sub>10</sub> & L<sub>90</sub>**: If a non-steady noise is to be described it is necessary to know both its level and the degree of fluctuation. The L<sub>n</sub> indices are used for this purpose, and the term refers to the level exceeded for n% of the time, hence L<sub>10</sub> is the level exceeded for 10% of the time and as such can be regarded as the 'average maximum level'. Similarly, L<sub>90</sub> is the average minimum level and is often used to describe the background noise.

It is common practice to use the L<sub>10</sub> 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.

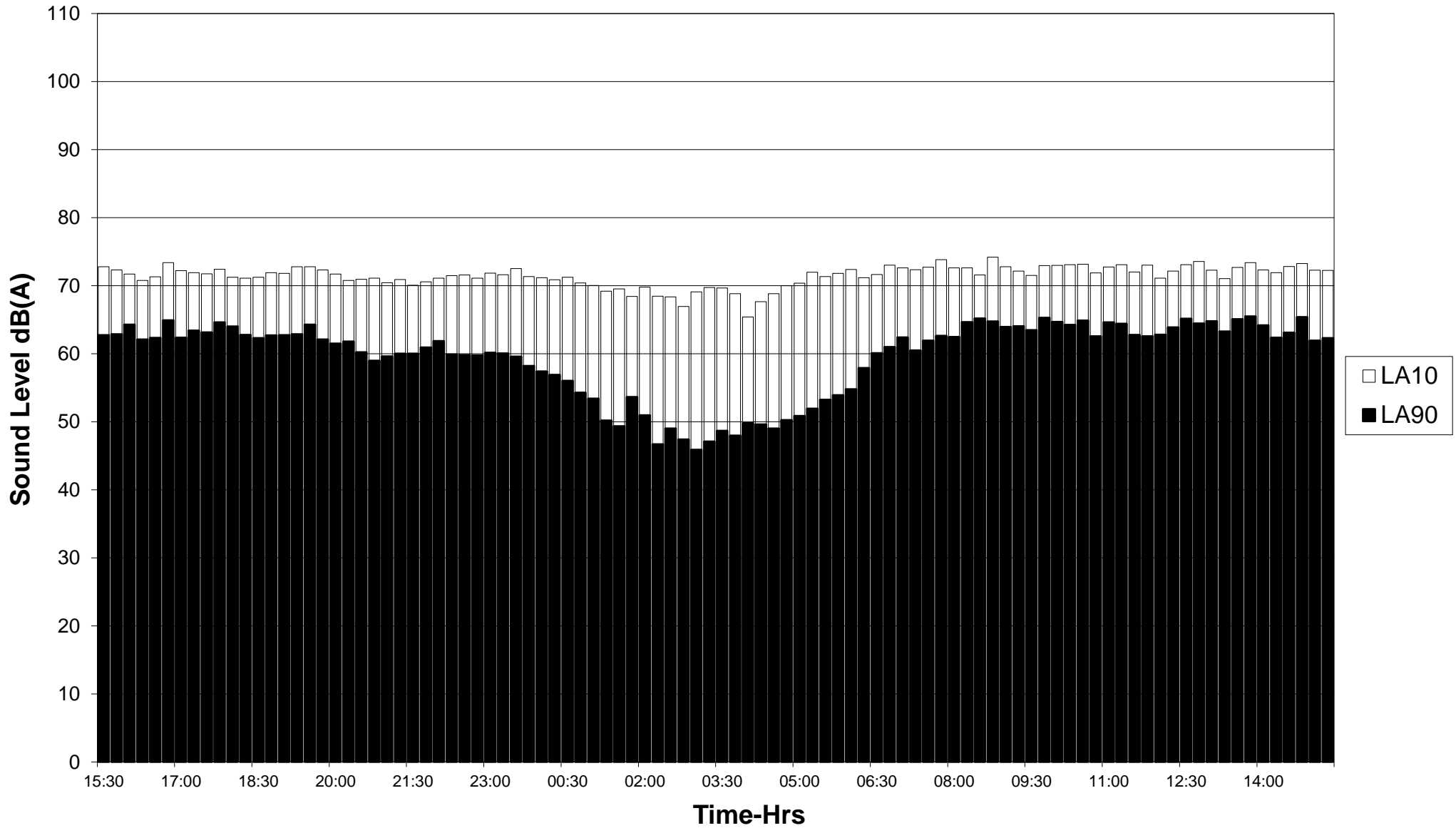
**L<sub>eq</sub>** : The concept of L<sub>eq</sub> (equivalent continuous sound level) has up to recently been primarily used in assessing noise in industry but seems now to be finding use in defining many other types of noise, such as aircraft noise, environmental noise and construction noise.

L<sub>eq</sub> 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).

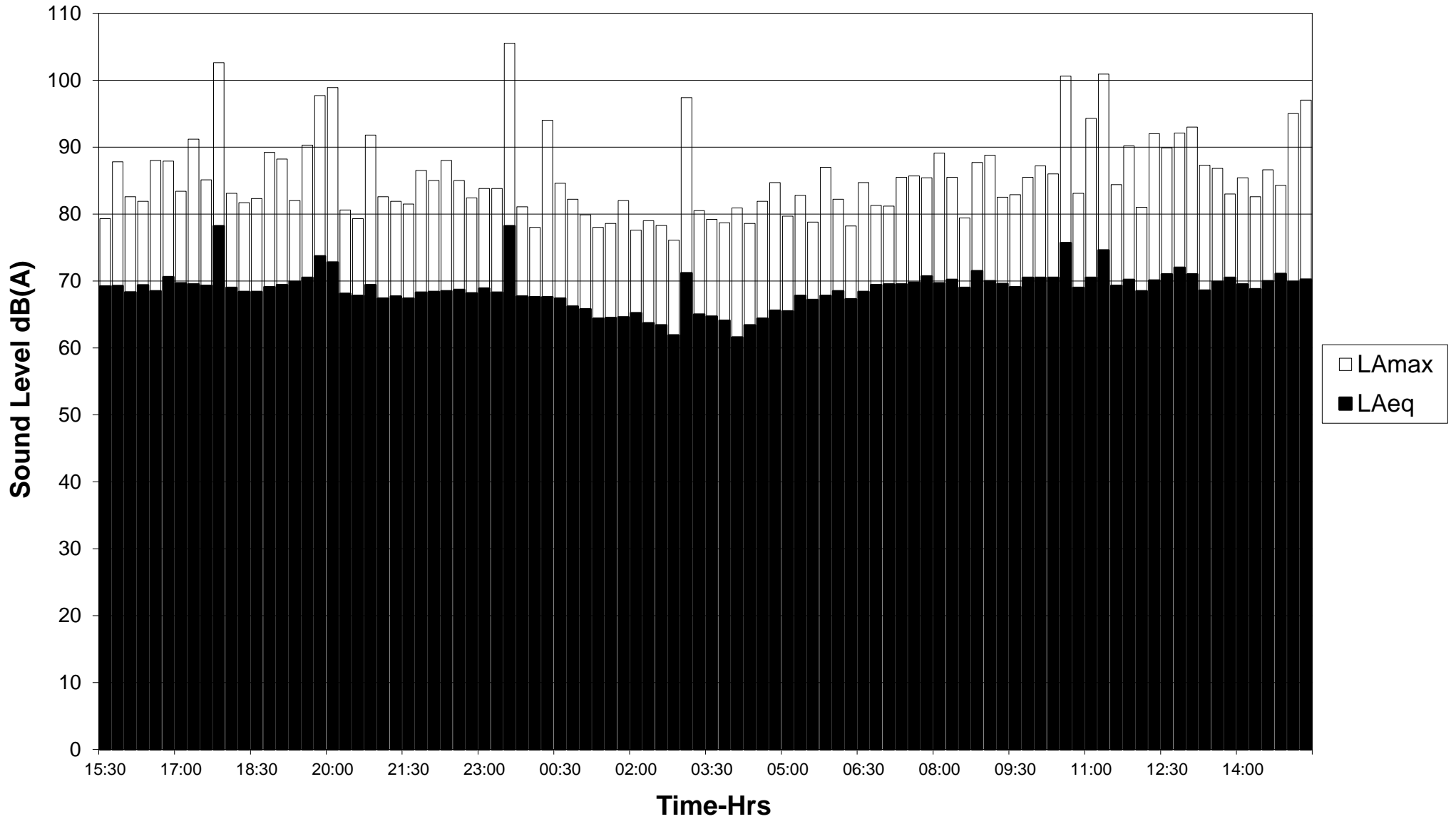
The use of digital technology in sound level meters now makes the measurement of L<sub>eq</sub> very straightforward.

**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.

**154-164 Gray's Inn Road & Panther House**  
**Position 1**  
**L<sub>A10</sub> and L<sub>A90</sub> Noise Levels**  
**Wednesday 22/07/2015 - Thursday 22/07/2015**



**154-164 Gray's Inn Road & Panther House**  
**Position 1**  
**L<sub>Aeq</sub> and L<sub>Amax</sub> Noise Levels**  
**Wednesday 22/07/2015 - Thursday 22/07/2015**

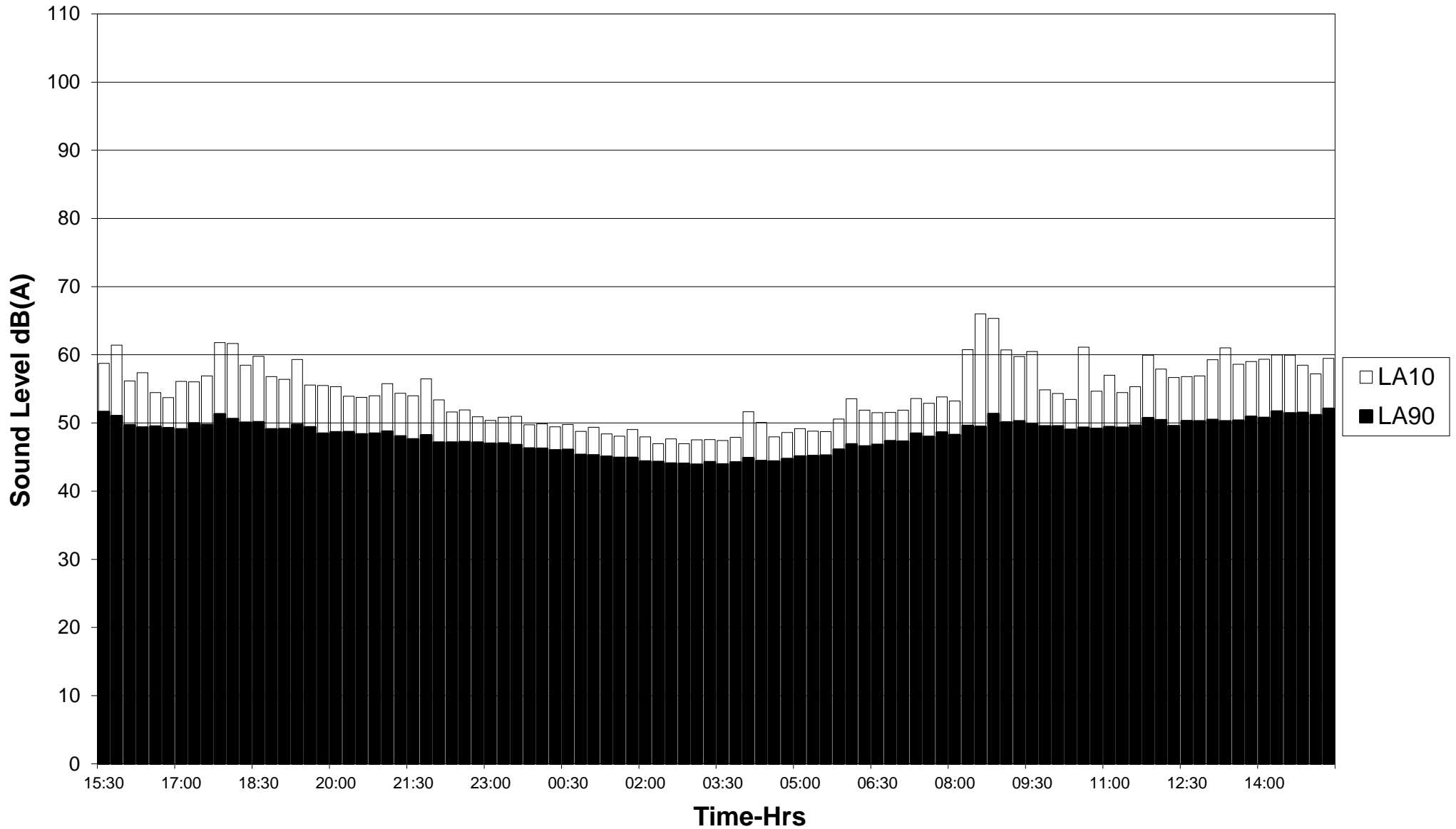


# 154-164 Gray's Inn Road & Panther House

## Position 2

$L_{A10}$  and  $L_{A90}$  Noise Levels

Wednesday 04/04/2012 - Thursday 05/04/2012



**154-164 Gray's Inn Road & Panther House**  
**Position 2**  
**L<sub>Aeq</sub> and L<sub>Amax</sub> Noise Levels**  
**Wednesday 22/07/2015 - Thursday 23/07/2015**

