Royal London House
194 Deansgate, Manchester

Noise Impact Assessment Report

25513/NIA1

21 May 2018

For:
CEG
c/o Indigo Planning Limited
St James Tower
7 Charlotte Street
Manchester
M1 4DZ

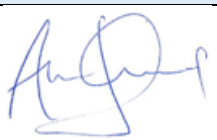
Hann Tucker Associates
Consultants in Acoustics Noise & Vibration

Head Office: Duke House, 1-2 Duke Street, Woking, Surrey, GU21 5BA (t) +44 (0) 1483 770 595
Manchester Office: First Floor, 346 Deansgate, Manchester, M3 4LY (t) +44 (0) 161 832 7041
(w) hanntucker.co.uk (e) enquiries@hanntucker.co.uk

Hann Tucker Associates

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Document Control

Rev	Date	Comment	Prepared by	Authorised by
00	21/05/2018	-		
			Lewis Stonehouse Senior Consultant BA(Hons), MSc, MIOA	Andrew Jameson Director BSc(Hons), MIOA, MIET

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Time History Graph 25513/TH1

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1.0 Introduction

A change of use from a takeaway to a coffee show has been proposed on the ground floor level of Royal London House, 194 Deansgate, Manchester.

Hann Tucker Associates have therefore been commissioned to undertake an environmental noise survey of the site and assess the potential noise impact the proposed redevelopment may have on surrounding properties.

This report presents our findings and recommendations.

2.0 Objectives

To establish, by means of fully automated environmental noise monitoring, the existing A-weighted (dBA) L_{90}, L_{eq} and L_{max} environmental noise levels at the site.

To undertake a review of the relevant guidance and industry standards to establish appropriate assessment criteria and methodology for various new noise sources associated with the development.

Based on the results of our environmental noise survey and the requirements of the Local Authority, to recommend suitable plant noise emission limits.

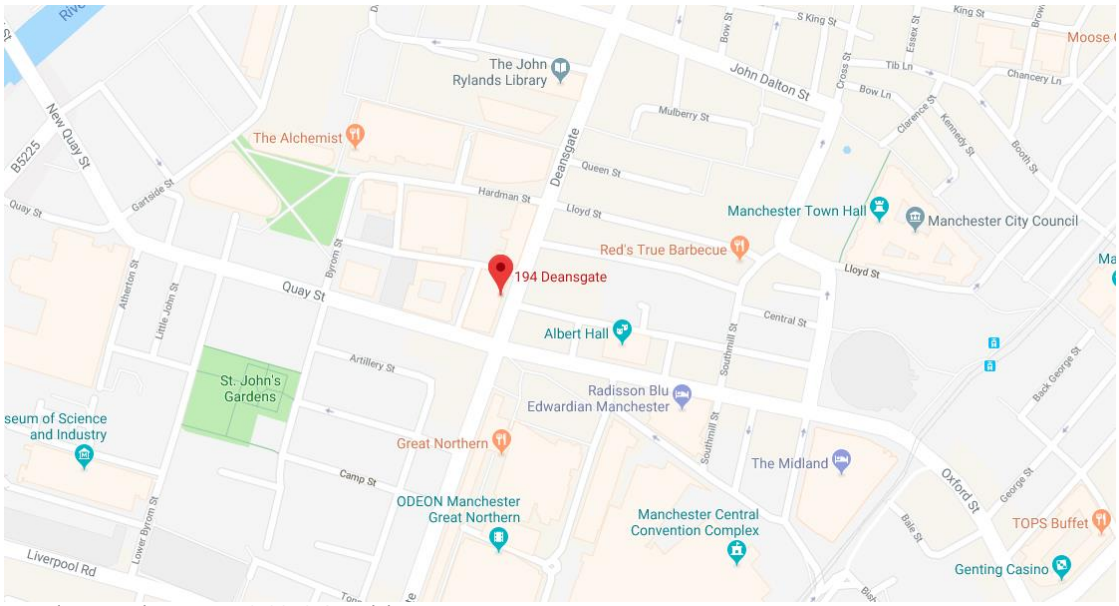
Based on the results of our site studies and with reference to the relevant guidance and industry standards, to assess the likely impact of operational noise generated by the proposed use at ground floor level upon other uses in the building and upon the surrounding buildings.

Where appropriate, to outline recommendations for mitigation measures to control noise generated by the development.

3.0 Site Description

3.1 Location

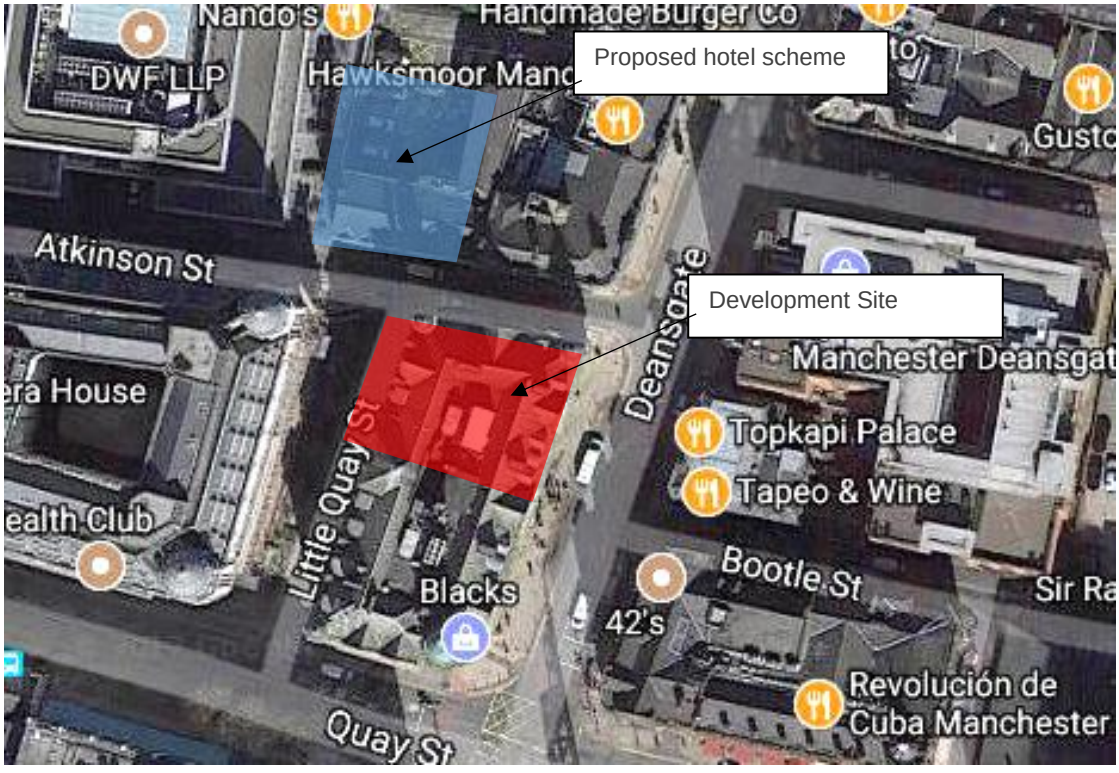
The site is located at Royal London House, 194 Deansgate and falls within Manchester City Council's jurisdiction. See Location Map below.



Location Map (Map Data © 2018 Google)

3.2 Description

The site comprises a ground plus five (5No.) storey building on Deansgate, with retail units on the ground and basement floors and office accommodation from floors 1 – 5. The surrounding buildings comprise predominantly commercial and retail uses and are generally comparable in height to 194 Deansgate. However, an existing commercial unit called Invicta House to the north over Atkinson Street has been granted planning approval for a conversion into a hotel. See Site Plan below.



Site Plan (Imagery © 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 Planning Policy/Guidance

5.1 Noise Policy Statement for England

The Government's Noise Policy Statement for England (NPSE, March 2010) sets out the long term vision for Government noise policy, which is to "*Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development*".

The NPSE includes three primary aims to be achieved through effective management of environmental, neighbour and neighbourhood noise; (1) avoid "significant adverse" impacts on health and quality of life, (2) mitigate and minimise "adverse" impacts on health and quality of life, and (3) where possible, contribute to the improvement of health and quality of life.

5.2 National Planning Policy Framework

The National Planning Policy Framework (NPPF, March 2012) sets out the Government's planning policies for England and how these are expected to be applied. It sets out the Government's requirements for the planning system only to the extent that it is relevant, proportionate and necessary to do so. It provides a framework within which local people and their accountable councils can produce their own distinctive local and neighbourhood plans, which reflect the needs and priorities of their communities.

The planning system should prevent both new and existing development from contributing to, or being put at, unacceptable risk from environmental factors including noise.

Planning policies and decisions should aim to avoid noise giving rise to significant adverse impacts on health and quality of life as a result of new development. Conditions may be used to mitigate and reduce noise to a minimum so that adverse impacts on health and quality of life are minimised.

Reference is made to the Government's Noise Policy Statement for England (NPSE, March 2010) which sets out the long term vision for Government noise policy, which is to "*Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development*".

5.3 Local Planning Requirements

Manchester City Council requirements are outlined in Section 3.0 of Manchester City Council's Planning & Noise Technical Guidance document (December 2015).

5.3.1 Noise from Fixed Building Services Plant

Section 3.6.1.5.1 outlines that the noise assessment for fixed plant should be based on BS 4142:2014 and the assessment must demonstrate that

"Externally mounted ancillary plant, equipment and servicing shall be selected and/or acoustically treated in accordance with a scheme so as to achieve a rating level of 5dB (L_{Aeq}) below the typical background (L_{A90}) level at the nearest noise sensitive location."

5.4 BS 4142: 2014

BS 4142: 2014 '*Method for Rating industrial noise affecting mixed residential and industrial areas*' describes methods for rating and assessing the effects of outdoor sound levels, of an industrial and/or a commercial nature, *"on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident".*

The impact of a specific sound is indicated by subtracting the existing background noise level from the rating level (i.e. noise level from the proposed items of plant/machinery/etc. plus any acoustic feature corrections).

The noise from the new development is expressed in terms of a rating level and given as a $L_{Aeq,T}$ noise level. The existing background noise level is expressed in terms of a $L_{A90,T}$ noise level. T is the assessment time interval, which is 1-hour for operations during daytime hours (07:00 to 23:00 hours) and 15-minutes for operations during night-time hours (23:00 to 07:00 hours). Acoustic penalties apply to plant emitting noise of a tonal, irregular or impulsive nature.

5.5 BS 8233: 2014

British Standard 8233: 2014 '*Guidance on sound insulation and noise reduction for buildings'* provides guidance for the control of noise intrusion and, for offices, suggests that an appropriate indoor ambient noise level design range is 45-50 dB L_{Aeq}.

5.6 IoA Good Practice on the Control of Noise from Pubs and Clubs

The Institute of Acoustics (IoA) present guidance on the control of noise from bars and restaurants in their "Good Practice on the Control of Noise from Pubs and Clubs". This document suggests the criteria should depend on the number of noisy events hosted at the site per year. For regular events, broadband and low frequency noise limits are recommended.

6.0 Baseline Environmental Noise Survey

6.1 Methodology

6.1.1 Procedure

Fully automated environmental noise monitoring was undertaken from approximately 15:30

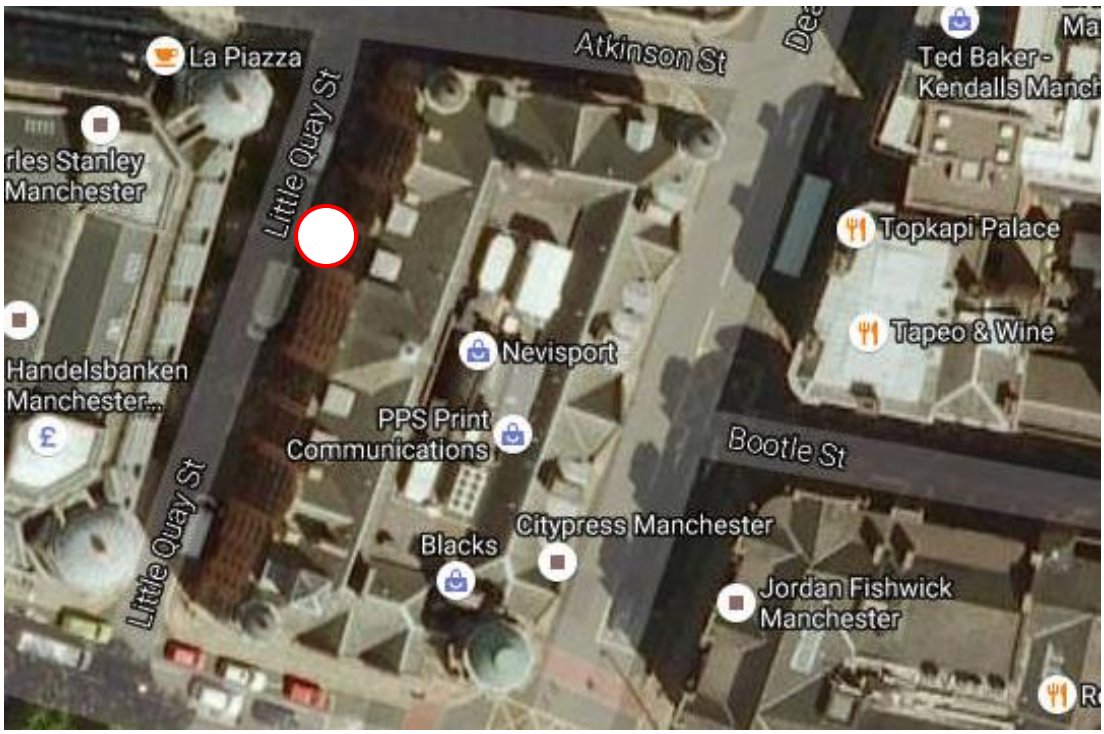
hours on Friday 27 April to approximately 10:00 hours on Tuesday 1 May 2018. The survey was undertaken by L. P. Stonehouse BA(Hons), MSc, MIOA.

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

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 measurements.

6.1.2 Measurement Position

The noise level measurements were undertaken at a single "façade" measurement position, with the microphone protruding from third floor level on the western façade of the building overlooking Little Quay Street as shown below.



Plan Showing Unmanned Measurement Positions (Imagery © 2018 Google)

6.1.3 Instrumentation

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

Description	Manufacturer	Type	Serial Number	Calibration
Type 1 Data Logging Sound Level Meter	Larson Davis	824	3533	30/08/2017
Type 1 Calibrator	Larson Davis	CAL200	3083	16/04/2018

The sound level meter, including the extension cable, was calibrated prior to and on completion of the surveys. No significant deviations occurred (no more than 0.1 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.

6.2 Results

The results have been plotted on Time History Graphs 25513/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 following table presents the lowest measured L_{A90} background noise levels during the survey:-

Period	Lowest Measured L_{A90} Background Noise Level (dB)
Daytime (07:00-23:00hr)	53
Night-time (23:00-07:00hr)	52

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 on the surrounding road network.

8.0 Operational (Entertainment) Noise Impact Assessment

8.1 Overview

The proposed basement/ground floor unit shall be used as a café (A3) with operational hours of 07:30-02:00.

We have been informed that the prospective tenant would intend to operate with background music only.

Our assessment considers the following noise transfer paths:-

- Café-to-office via floor.
- Café noise breakout to external receptors.

For internal (structural) noise transfer, our assessment is based on the understanding from the client, who owns the offices, that office spaces will only generally be sensitive to noise during typical office hours (i.e. 08:00-20:00hr on weekdays).

Externally, the nearest noise sensitive receptors considered in our assessment are summarised below.

Receptor Type	Sensitive	Location (Distance)
Office	Daytime Only	Upper floor offices across Deansgate & Atkinson Street (7 metres at its closest).
Residential	24-hour	Proposed Hotel Development at Invicta House (10 metres).

To inform our assessment of the unit operating as a cafe, we have drawn upon previously measured noise levels within a similar café in Manchester City Centre during a busy service with 'background' music. These typical noise levels are presented below.

Location	Typical Highest Reverberant Noise Level (dB $L_{eq,5\text{-}min}$) at Octave Band Centre Frequency (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
Within café	59	65	64	62	59	56	53	48	64

8.2 Proposed Assessment Criteria

Internal Noise Transfer

Based on the above and the guidelines reviewed in Section 5.0, we would suggest internal noise transfer to adjacent offices areas is controlled to a level 10 dB below normal office internal noise level design targets. This would be generally in line with MCC guidelines, although these are primarily focused on residential receptors. Consideration should be given to low frequency noise transfer, and thus it would be appropriate to assign octave band noise limits.

Offices are typically designed to achieve an internal noise level of circa NR 35 L_{eq}. In line with MCC guidance, we would therefore propose operational noise from the A3 unit is controlled to achieve NR 25 L_{eq} in the office space above as per below:-

Internal Noise Transfer from Commercial Unit

Receive Location (Sensitive Period)	Operational Noise Limit, L_{eq} (dB) at OCBF (Hz)								Broadband
	63	125	250	500	1k	2k	4k	8k	
First Floor Office	55	44	35	29	25	22	20	18	NR25

After 20:00, we have been informed that the office accommodation above will not be sensitive

to noise transfer as the space is not expected to be occupied. **We understand this has been verified by the Landlord.**

External Noise Breakout

In relation to noise egress to external receptors, operational noise shall achieve the following noise limits at 1 metre from receptor windows, which are 10 dB below prevailing background noise levels (in line with MCC requirements).

External Noise Breakout from Commercial Unit

External Receptor Type	Operational Noise Limit, $L_{eq,5min}$ (dB) at OCBF (Hz)								Broadband (dBA)
	63	125	250	500	1k	2k	4k	8k	
Office	54	43	42	41	39	38	33	25	43

8.3 Assessment of Internal Noise Transfer

In order to inform an accurate assessment of noise transfer to the office space above, we have drawn upon the results of the airborne sound insulation test of the separating floor that was undertaken for the assessment of the adjacent unit (196 Deansgate). The measured airborne sound insulation performance of the floor is summarised below (presented in terms of the level difference, D).

Element	Level Difference, D (dB) at OCBF (Hz)							
	63	125	250	500	1k	2k	4k	8k
Floor	32	39	46	53	61	65	65	65

Based on the above, the latest drawings for the scheme and “cafe” reverberant source noise levels, we have assessed daytime (08:00-20:00) the results of our noise transfer calculation are summarised below.

Desc.	Sound Level L_{eq} (dB) at OCBF (Hz)								Broadband, dBA (NR)
	63	125	250	500	1k	2k	4k	8k	
Source Room Level	59	65	64	62	59	56	53	48	64
Calculated Receive Room Level	**25**	**23**	**14**	**4**	**<0**	**<0**	**<0**	**<0**	**NR2**
Proposed Limits	55	44	35	29	25	22	20	18	NR25
Compliance Note	✓	✓	✓	✓	✓	✓	✓	✓	✓

The above indicates the operation of the unit as a café during the daytime should comfortably satisfy our proposed noise limits within the first floor office accommodation.

8.4 Assessment of External Noise Breakout

The facades of the commercial unit will comprise:-

- Single glazed windows to be retained and renovated;
- 500mm thick (min) masonry walls, made good;
- Single-glazed entrance door.

The sound reduction performance figures for these elements used in our calculations are presented below.

Element	Estimated Sound Reduction, R (dB) at Octave Band Centre Frequency (Hz)							
	63	125	250	500	1k	2k	4k	8k
Wall	42	49	50	55	60	65	65	65
Windows	15	20	22	25	26	29	34	41
Door	15	17	24	30	28	24	28	30

Based on the above, the latest drawings for the scheme and both “restaurant” and “late bar” reverberant source noise levels, we have assessed the daytime 08:00-20:00hr operational noise output and the evening/night 20:00-02:00hr operational noise output to the nearest office window and residential receptors. The results are summarised below and compared against the proposed assessment criteria.

Our assessment is based on the following equation where SRI is the composite sound reduction of the facade, r is distance and S is the radiating area.

$$SPL_{out} = SPL_{in} - SRI + 10\log_{10}\left(\frac{S}{r^2}\right) - 14$$

Daytime Operation (08:00-20:00) – to Upper Floor Offices over Deansgate & Atkinson Street

Description	Sound Level (dB) at OBCF (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
SPL in, $L_{eq,5min}$	59	65	64	62	59	56	53	48	64
Composite SRI	16	22	26	30	30	29	34	36	-
$10*\log_{10}(S/r^2)$	-7	-7	-7	-7	-7	-7	-7	-7	-
-14	-14	-14	-14	-14	-14	-14	-14	-14	-
SPL at receptor, $L_{eq,5min}$	**23**	**22**	**17**	**11**	**8**	**6**	**<0**	**<0**	**15**
Proposed Limits	54	43	42	41	39	38	33	25	43
Compliance Note	✓	✓	✓	✓	✓	✓	✓	✓	✓

The above indicates the operation of the unit as a café during the daytime should comfortably satisfy the proposed noise breakout limits, thus indicating no adverse noise impact on its surroundings.

9.0 Plant Noise Emissions

9.1 Proposed Limits

On the basis of the requirements of the Local Authority as outlined in Section 6.2 and the results of the environmental noise survey, we propose that the following plant noise emission limits be achieved at the nearest noise sensitive location with all plant operating simultaneously. This is 5 dB below the measured background noise level (corrected to free-field).

Period	BS 4142 Plant Noise Rating Limit (dB)
Daytime (07:00-23:00hr)	48
Night-time (23:00-07:00hr)	38

Plant noise shall be assessed in accordance with BS 4142: 2014 and shall be subject to the final approval of Manchester City Council. This could include pre completion noise level checks on the installed plant.

9.2 Assessment

We would be pleased to review proposals upon receipts of the required information.

10.0 Conclusions

The existing A-weighted (dBA) L_{90}, L_{eq} and L_{max} environmental noise levels at the site have been established by means of fully automated environmental noise monitoring.

A review of the relevant guidance and industry standards has been undertaken to establish appropriate assessment criteria and methodology for various new noise sources associated with the development.

Based on the results of our environmental noise survey and the requirements of the Local Authority, appropriate plant noise emission limits have been set. We will be happy to undertake a detailed assessment of plant proposals when selections have been finalised.

The likely impact of noise generated by the proposed café at ground and basement floor levels upon other uses in the building and upon the surrounding buildings has been assessed.

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.

L_p — Sound Pressure Level (SPL) 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).

L_w — Sound Power Level (SWL) 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).

194 Deansgate, Manchester

A-weighted Sound Levels at Automated Position 1

Friday 27 April - Tuesday 1 May 2018

25513/TH1

