

**DOUBLE TREE BY HILTON LONDON – WEST END
92 SOUTHAMPTON ROW
BLOOMSBURY
LONDON
WC1B 4BH**

24 HOUR ENVIRONMENTAL NOISE ASSESSMENT

Our Ref: CPT/060918/004

Report prepared by:

SPEK Noise Control Ltd
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Lichfield
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Written By:

Cliff Tucker AMIOA

Date: 6th September 2018

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Disclaimer:

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1.0 Brief

- 1.1 To carry out an Environmental Noise Assessment & Report in order to establish the prevailing environmental noise levels enjoyed by the site.
- 1.2 From these measurements and through liaison with the Local Authority we establish an acoustic design criterion (the Rating Level) 1.0 meters from the nearest acoustically critical location (the Assessment Position).
- 1.3 To analyse the published acoustic data for the proposed equipment in relation to the Rating Level including any proposed acoustic control hardware in order to establish compliance or otherwise.
- 1.4 We have excluded the following from our brief:
 - Construction noise
 - Any Building Regulations noise considerations
 - Traffic noise/traffic count per se, although we have recorded LA10 percentiles.
 - Health and safety acoustics.

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2.0 Executive Summary

- 2.1 An Environmental Noise Assessment has been carried out at Double Tree by Hilton Hotel, 92 Southampton Row, London, WC1B 4BH.
- 2.2 A minimum background noise level of 44 (43.9) dB LA_{90, 15mins} has been measured for the hours of operation of the proposed plant.
- 2.3 A Rating Level is set at 10 dB below the relevant background noise levels, as per Camden Council's normal conditions.
- 2.4 The Rating Level is therefore be 34 dB LA_{eq, 15 mins}.
- 2.5 The proposed plant is to installed at various locations at roof top level and should be designed, selected, located and acoustically treated to ensure that the cumulative specific noise level with all plant operating at normal duties does not exceed 34 dB-A at the closest potential points of complaint (the Assessment Positions).
- 2.6 At the time of writing the final plant selections are unavailable. Once the make, model, quantity and proposed locations for the plant is finalised it will be necessary to issue a supplementary report with detailed acoustic calculations to confirm that this condition can be met.

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3.0 Description & Location

- 3.1 The Double Tree by Hilton Hotel London West End is an eight-storey hotel located in a street of mixed commercial and residential properties within the London Borough of Camden.
- 3.2 The hotel is undergoing significant refurbishment and this report is in relation to Phase 3 of those works whereby the proposal is to increase the number of guest rooms by eighteen rooms over six floors.
- 3.3 It is proposed that new and relocated plant will be located on the newly created roof space adjacent to the Atrium.
- 3.4 The proposed plant consists of approximately 22 no. new/ relocated air conditioning condenser units; a single chiller; approximately 5 no. heat recovery units; and 4 no. extract ducts from the ensuite bathrooms located below.
- 3.5 The hotel is bounded by Southampton Row to the South West with 5 Bloomsbury Place beyond; mixed commercial/ residential property aligning the North East side of Southampton Row to the North West; the rear of the properties aligning the South West side of Old Gloucester Street to the North East; and further mixed commercial/ residential property to the South East.

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4.0 Instrumentation

4.1 The instrumentation employed was:

- Rion NL-32/NX-22RT Class 1 Environmental Noise Analyser
- Rion NC74 Class1 Acoustic Calibrator
- Rion 12 mm Condenser Microphone & Foam Windshield on 1,5 meter Extension Pole.
- Rion Weatherproof Security Box

4.2 The instruments carry current calibration certificates a copy of which is available from our offices upon request.

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5.0 Time, Date & Environmental Conditions

- 5.1 The survey was conducted from 10.04 on the 15th August 2018 through until 10.04 on the 16th August 2018.
- 5.2 The weather throughout the survey period was warm with clear skies, occasional light rain and light winds.
- 5.3 The site engineer was Cliff Tucker: the results were analysed & reported by Cliff Tucker.

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6.0 Methodology.

- 6.1 The survey and report generally follow the procedures, method and assessments as described in BS 4142: 2014 'Methods for rating and assessing industrial and commercial sound'.
- 6.2 The standard requires a comparison between the typical measured background noise level and the equivalent continuous A-weighted sound pressure level of the proposed plant at the Assessment Position.
- 6.3 BS4142: 2014 also requires uncertainty to be considered as part of the assessment.
- We have undertaken a 24 hour background noise survey and the data gathered has been analysed to ensure that any influences from the weather conditions have been accounted for in the assessment.
 - The calibration of the sound level meter was checked before and after the survey period and no significant drift found.
 - Standard acoustic theory has been applied in the noise propagation calculations.

It is therefore considered that the uncertainty associated with the assessment is minimal and the results, as stated, are therefore valid.

- 6.4 The Reference Time Interval used for the survey was 15 minutes.
- 6.5 The microphone position (the measurement position) was at roof top level on the North West façade of the building.
- 6.6 The background level as measured at the microphone position is considered to be representative of the levels enjoyed at the Assessment Positions.
- 6.7 The Assessment Positions are as follows:
- 5 Bloomsbury Place located to the South West of the hotel and not less than 17 m from the building boundary.
 - The top floor North Eastern elevation window of 86 Southampton Row located to the North West and a distance of not less than 10 m from the building boundary.
 - The rear of the properties aligning Old Gloucester Street located to the North East and a distance of

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- not less than 13 m from the proposed closest plant location.
 - The top floor North Eastern façade windows of 106A Southampton Row located to the South East and a distance of not less than 12 m from the building boundary.
- 6.8 The measurement position; assessment positions; and the other relevant points of interest are shown on the plan within Appendix 'A'.
- 6.9 The measured levels were the principle LA percentiles as prescribed in BS 4142.
- 6.10 The most significant of the measured percentiles for our purposes are as follows:
- LA_{eq} , (the mean sound pressure level corresponding to a fluctuation level across time period 't'). Used for the measurement and assessment of the Ambient Noise Level; The Specific Noise Level; The Residual Level and the Rating Level
 - LA_{10} ('A' weighted level exceeded for 10% of the time) is used for traffic noise assessment.
 - LA_{90} , ('A' weighted level exceeded for 90% of the time). Represents the Background Level and is often used as the target threshold against which the acoustic design criteria are set.
- We also measured the maximum and minimum levels.
- 6.11 You will note the basic objective is to establish a Rating Level at the Assessment Point for comparison with the specific noise level from any new plant in order to predict the likelihood of noise complaint.
- 6.12 Camden Council's requirements are for any new noise to be not less than 10 dB-A below the minimum background noise level for the hours of operation of the equipment.
- 6.13 The plant has the propensity to operate 24 hours per day, 7 days per week.

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7.0 Results Summary & Assessment of Required Rating Level

- 7.1 The full set of measured levels are presented in Appendix C of this report
- 7.2 The plant has the propensity to operate 24 hours per day 7 days per week.
- 7.3 The minimum $LA_{90, 15 \text{ mins}}$ level measured was 43.9 dB LA_{90} measured through at 04.04 on the 16th August 2018.
- 7.4 The Rating Level is therefore set at 34 dB $LA_{eq, 15 \text{ mins}}$.

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8.0 Analysis

As the make, model, quantities, and locations of the proposed plant is as yet undecided we cannot, at this stage, produce calculations to verify that the Local Authorities requirements will be met.

Once the proposed plant schedules and the installation locations have been finalised it will be necessary to submit a supplementary report demonstrating compliance with the Local Authorities requirements.

Given the proposed number of different plant items it is likely that attenuation in the form of open top acoustic enclosures/ screens will be required to mitigate the noise levels, particularly when operating at full duty.

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9.0 Conclusion

The new plant that is to be installed should be designed, selected, located and acoustically treated to ensure that the specific noise level from the proposed plant as measured at the Assessment Positions does not exceed 34 dB LA_{eq}, 15mins.

Assuming this is achieved as outlined above then the Local Authority's requirements in terms of noise will be met.

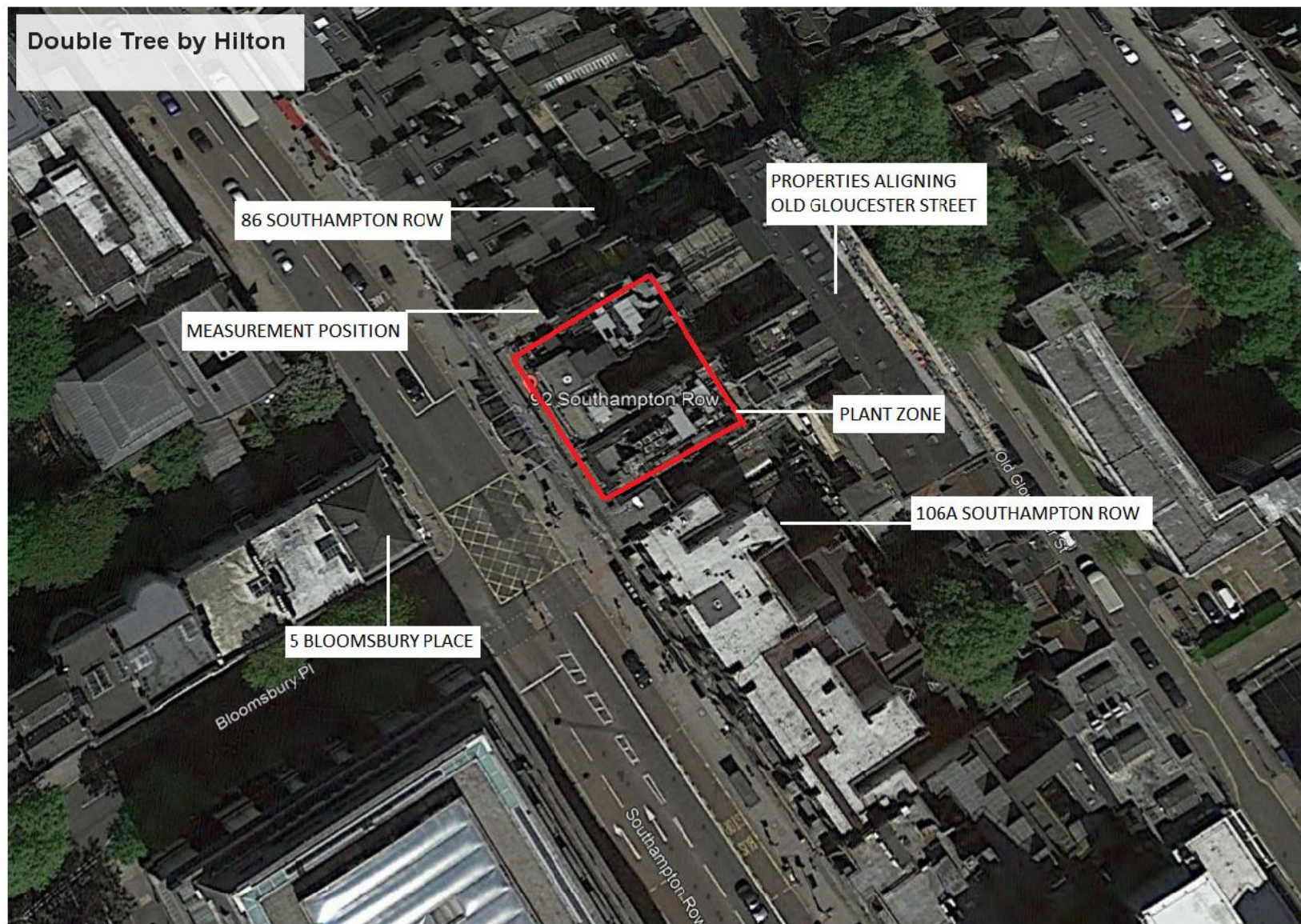
Report ends

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APPENDIX A – Positions, Distances, & Locations

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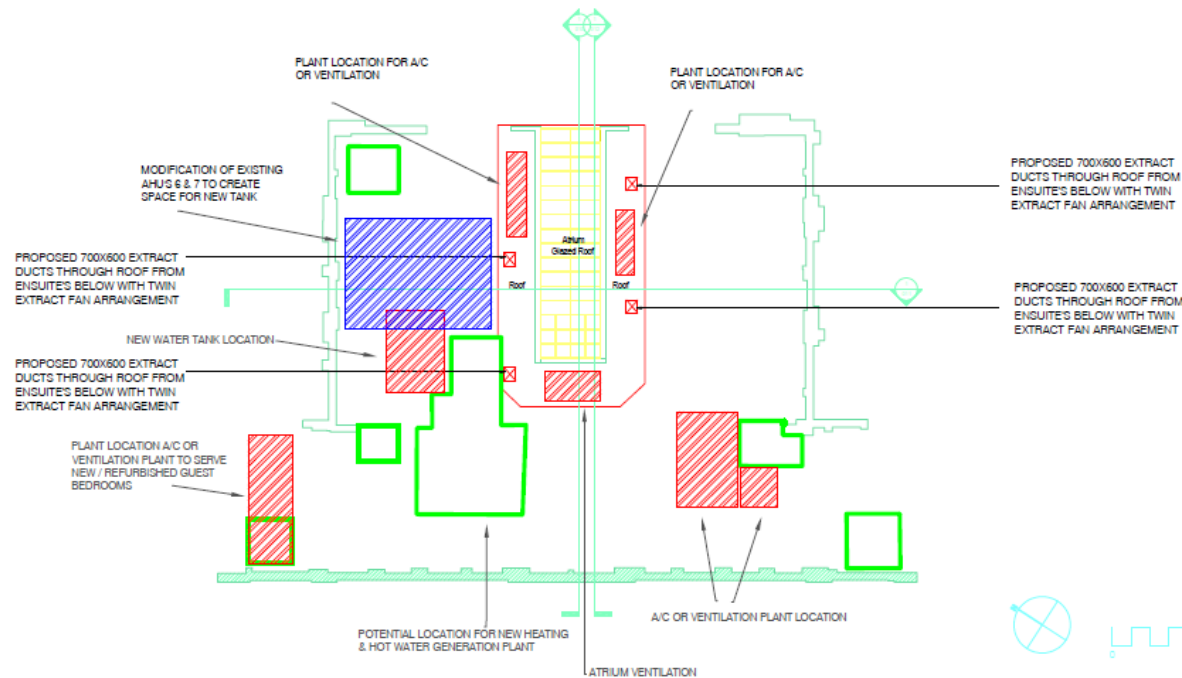


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DO NOT SCALE

ALL DIMENSIONS TO BE CHECKED ON SITE

NOTES:



REV	DATE	COMMENTS
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DRAWING STATUS INFORMATION ONLY

PROJECT

DOUBLETREE WEST END

PHASE 3

CLIENT

CRIMSON HOTELS

IN ASSOCIATION WITH

MORRISON DESIGN

DRAWING TITLE

POTENTIAL ROOFTOP

PLANT LOCATIONS

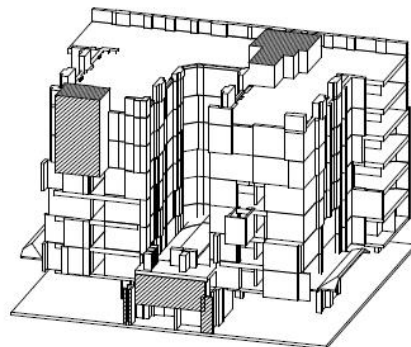
HBS HOCKLEY BUILDING SERVICES LIMITED

Holly House, 9-11 Holly Lane, Manton Green, Birmingham B37 7AP
 T: 0121 685 4545 F: 0121 685 4546 E: admin@hockley-bs.com

DRAWN BY	CHECKED BY	APPROVED BY
LMc	LMc	LMc

START DATE	SCALE	DRAWING SIZE
27/07/18	NTS	A3

JOB No.	DRAWING No.	REVISION
TBC	SCH-4756-RT	-



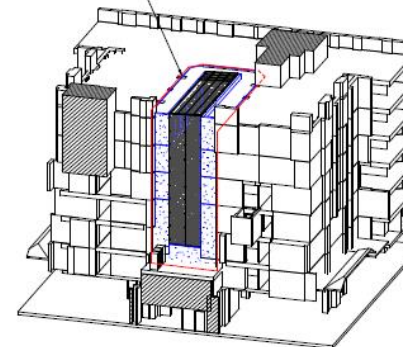
Existing view of from
adjacent hotel roof top



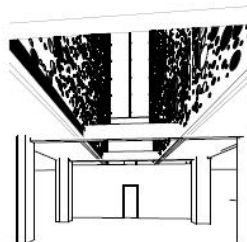
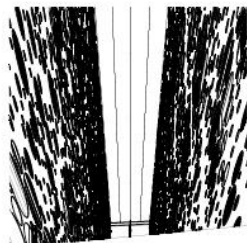
Existing view of lightwell
from adjacent hotel roof top



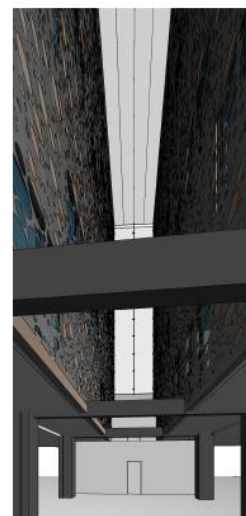
Existing view of bottom of
lightwell / roof of reception
from adjacent hotel roof top



② 3D Model - Proposed



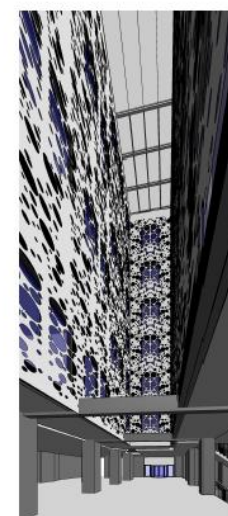
4 3D Artistic View - Reception



3 3D Reception View - Shaded



5 3D Artistic View - Entrance



6 3D Entrance View - Shaded

Revision	Description	Date
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MORRISON DESIGN
CHARTERED ARCHITECTS

St Alkmunds House, 103 Belper Road, Derby DE1 3ES
T 01332 363266 F 01332 291441 Email: info@northondesign.co.uk

Job Title
DoubleTree West End Hotel

Phase 3 Preliminary Proposals

Drawing Title
Atrium 3D Views

File Size:
Printer Settings:

Exhibit 8.1 1-1000 Counts (20) Checked: Check Date: 12/28/05

Job No.	Revision No.	Revision
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3984 SK003

PRELIMINARY

Appendix B – Full Measured Levels

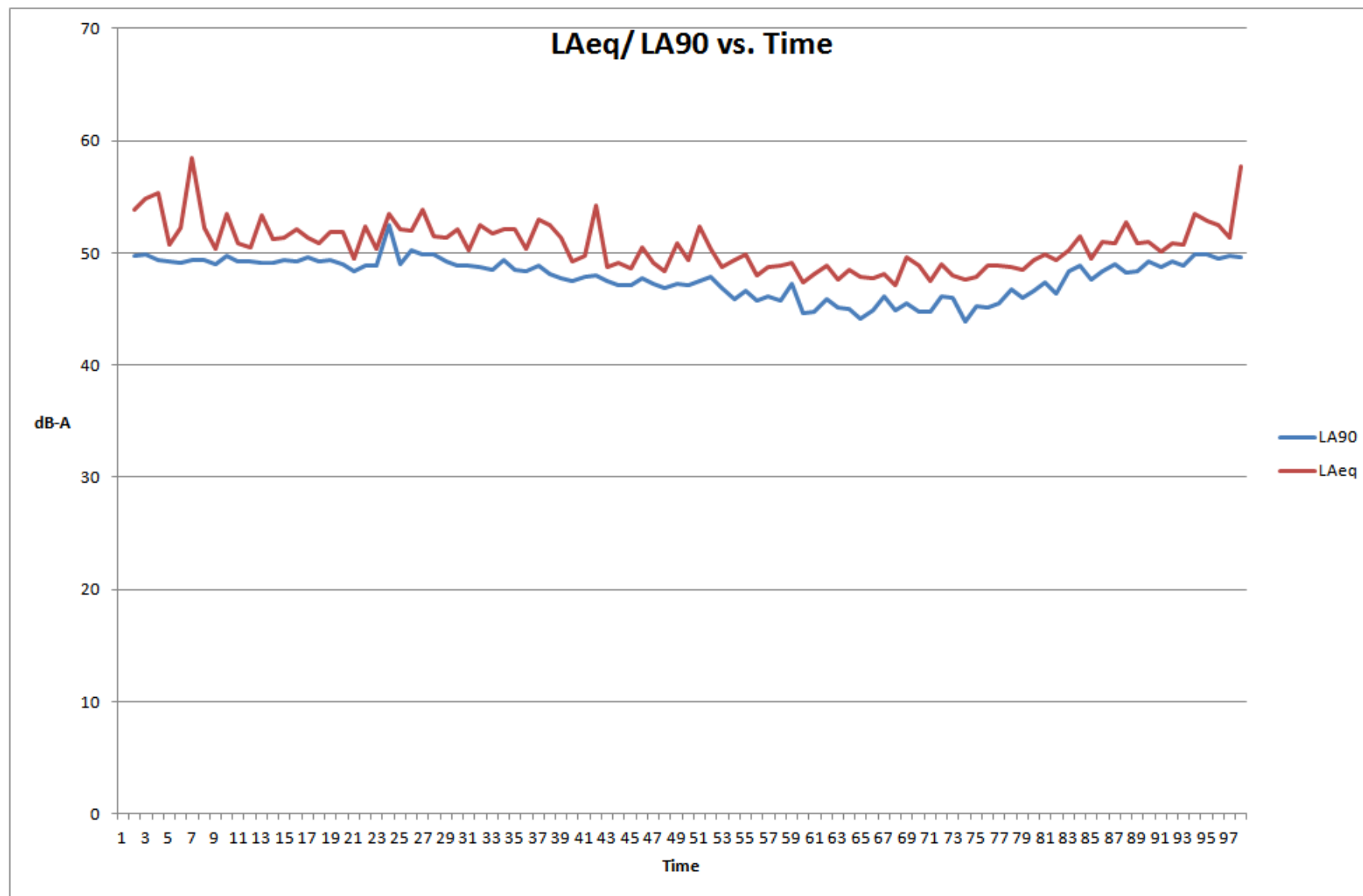
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<u>Ref</u>	<u>Time</u>	<u>Measurment Time</u>	<u>L_{Amax}</u>	<u>L_{Amin}</u>	<u>L_{A10}</u>	<u>L_{A90}</u>	<u>L_{Aeq}</u>
1	15/08/2018 10:04	0:15:00	80.3	48.2	53.0	49.7	53.9
2	15/08/2018 10:19	0:15:00	67.6	47.8	57.0	49.8	54.8
3	15/08/2018 10:34	0:15:00	67.8	47.9	60.1	49.4	55.3
4	15/08/2018 10:49	0:15:00	62.8	47.7	51.5	49.2	50.7
5	15/08/2018 11:04	0:15:00	66.4	47.8	53.3	49.1	52.2
6	15/08/2018 11:19	0:15:00	75.6	48.3	60.7	49.4	58.5
7	15/08/2018 11:34	0:15:00	62.7	48.4	54.4	49.4	52.2
8	15/08/2018 11:49	0:15:00	62.1	47.7	51.3	49.0	50.3
9	15/08/2018 12:04	0:15:00	71.4	48.6	56.1	49.7	53.5
10	15/08/2018 12:19	0:15:00	64.7	47.7	52.3	49.2	50.9
11	15/08/2018 12:34	0:15:00	64.2	48.1	51.4	49.2	50.5
12	15/08/2018 12:49	0:15:00	70.6	47.5	53.0	49.1	53.3
13	15/08/2018 13:04	0:15:00	66.8	47.9	51.3	49.1	51.2
14	15/08/2018 13:19	0:15:00	66.7	47.9	51.5	49.3	51.4
15	15/08/2018 13:34	0:15:00	67.2	48.0	51.9	49.2	52.1
16	15/08/2018 13:49	0:15:00	70.3	48.2	53.0	49.6	51.3
17	15/08/2018 14:04	0:15:00	66.7	47.6	52.1	49.2	50.9
18	15/08/2018 14:19	0:15:00	67.5	48.2	53.5	49.4	51.9
19	15/08/2018 14:34	0:15:00	66.5	47.4	53.0	49.0	51.8
20	15/08/2018 14:49	0:15:00	62.7	46.8	50.5	48.4	49.5
21	15/08/2018 15:04	0:15:00	70.3	47.3	52.9	48.9	52.3
22	15/08/2018 15:19	0:15:00	67.9	47.6	51.1	48.9	50.3
23	15/08/2018 15:34	0:15:00	71.7	49.7	54.3	52.5	53.5
24	15/08/2018 15:49	0:15:00	72.6	47.2	53.3	49.0	52.1
25	15/08/2018 16:04	0:15:00	64.3	49.0	53.7	50.2	52.0
26	15/08/2018 16:19	0:15:00	68.5	48.6	56.0	49.9	53.8
27	15/08/2018 16:34	0:15:00	65.9	48.6	52.5	49.9	51.5
28	15/08/2018 16:49	0:15:00	59.0	47.9	53.3	49.2	51.3
29	15/08/2018 17:04	0:15:00	66.0	47.0	54.2	48.8	52.1
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37	15/08/2018 19:04	0:15:00	68.9	46.5	53.2	48.1	52.5
38	15/08/2018 19:19	0:15:00	77.6	45.7	52.5	47.7	51.3
39	15/08/2018 19:34	0:15:00	61.5	46.0	50.6	47.5	49.2
40	15/08/2018 19:49	0:15:00	60.3	46.1	51.2	47.9	49.7
41	15/08/2018 20:04	0:15:00	70.0	46.6	56.3	48.0	54.2
42	15/08/2018 20:19	0:15:00	62.6	46.1	49.9	47.5	48.7
43	15/08/2018 20:34	0:15:00	64.4	45.7	50.0	47.1	49.1
44	15/08/2018 20:49	0:15:00	58.5	45.6	49.8	47.1	48.6
45	15/08/2018 21:04	0:15:00	70.3	45.8	52.7	47.8	50.5
46	15/08/2018 21:19	0:15:00	64.5	45.3	50.5	47.3	49.1
47	15/08/2018 21:34	0:15:00	58.5	45.4	49.6	46.9	48.4

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<u>Ref</u>	<u>Time</u>	<u>Measurement Time</u>	<u>L_{Amax}</u>	<u>L_{Amin}</u>	<u>L_{A10}</u>	<u>L_{A90}</u>	<u>L_{Aeq}</u>
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49	15/08/2018 22:04	0:15:00	64.8	45.7	50.8	47.1	49.4
50	15/08/2018 22:19	0:15:00	70.8	46.0	54.6	47.5	52.4
51	15/08/2018 22:34	0:15:00	67.6	45.5	50.3	47.9	50.3
52	15/08/2018 22:49	0:15:00	60.9	45.0	50.1	46.9	48.7
53	15/08/2018 23:04	0:15:00	66.7	44.5	49.9	45.9	49.4
54	15/08/2018 23:19	0:15:00	71.6	44.8	52.3	46.6	49.8
55	15/08/2018 23:34	0:15:00	63.6	43.9	49.6	45.7	48.0
56	15/08/2018 23:49	0:15:00	62.1	44.6	49.9	46.1	48.7
57	16/08/2018 00:04	0:15:00	64.8	43.5	52.0	45.7	48.8
58	16/08/2018 00:19	0:15:00	64.6	45.5	50.3	47.2	49.1
59	16/08/2018 00:34	0:15:00	59.6	42.6	49.2	44.6	47.4
60	16/08/2018 00:49	0:15:00	59.5	42.8	50.5	44.7	48.1
61	16/08/2018 01:04	0:15:00	63.7	43.8	51.3	45.9	48.8
62	16/08/2018 01:19	0:15:00	59.7	43.6	48.6	45.1	47.6
63	16/08/2018 01:34	0:15:00	70.5	43.6	52.5	45.0	48.5
64	16/08/2018 01:49	0:15:00	63.4	42.3	49.5	44.1	47.9
65	16/08/2018 02:04	0:15:00	59.7	42.8	49.4	44.9	47.7
66	16/08/2018 02:19	0:15:00	58.3	43.9	49.7	46.1	48.1
67	16/08/2018 02:34	0:15:00	63.8	42.9	48.5	44.9	47.1
68	16/08/2018 02:49	0:15:00	71.5	43.6	52.4	45.5	49.6
69	16/08/2018 03:04	0:15:00	64.3	42.6	49.6	44.8	48.9
70	16/08/2018 03:19	0:15:00	59.5	42.5	49.6	44.7	47.5
71	16/08/2018 03:34	0:15:00	70.9	42.8	51.4	46.1	49.0
72	16/08/2018 03:49	0:15:00	64.4	44.8	49.2	46.0	48.0
73	16/08/2018 04:04	0:15:00	62.0	41.9	50.0	43.9	47.6
74	16/08/2018 04:19	0:15:00	63.5	43.5	49.5	45.3	47.9
75	16/08/2018 04:34	0:15:00	63.1	41.2	49.6	45.1	48.9
76	16/08/2018 04:49	0:15:00	59.6	43.4	51.8	45.5	48.8
77	16/08/2018 05:04	0:15:00	63.2	44.8	50.0	46.7	48.7
78	16/08/2018 05:19	0:15:00	61.5	44.0	49.7	46.0	48.5
79	16/08/2018 05:34	0:15:00	62.8	43.7	51.8	46.6	49.3
80	16/08/2018 05:49	0:15:00	63.4	45.7	51.4	47.4	49.9
81	16/08/2018 06:04	0:15:00	64.9	44.4	51.8	46.4	49.3
82	16/08/2018 06:19	0:15:00	57.5	46.7	51.9	48.4	50.2
83	16/08/2018 06:34	0:15:00	70.5	46.8	53.0	48.8	51.5
84	16/08/2018 06:49	0:15:00	63.5	46.2	50.9	47.6	49.5
85	16/08/2018 07:04	0:15:00	70.4	46.8	53.0	48.3	51.0
86	16/08/2018 07:19	0:15:00	63.6	47.4	52.3	49.0	50.9
87	16/08/2018 07:34	0:15:00	68.5	46.3	53.5	48.2	52.7
88	16/08/2018 07:49	0:15:00	63.6	46.9	53.1	48.3	50.8
89	16/08/2018 08:04	0:15:00	66.0	47.8	52.2	49.2	51.0
90	16/08/2018 08:19	0:15:00	59.2	47.3	51.4	48.7	50.1
91	16/08/2018 08:34	0:15:00	62.0	47.8	52.1	49.2	50.9
92	16/08/2018 08:49	0:15:00	60.6	47.6	51.8	48.9	50.7
93	16/08/2018 09:04	0:15:00	68.5	48.6	54.5	49.9	53.5
94	16/08/2018 09:19	0:15:00	69.1	47.9	54.6	49.9	52.9
95	16/08/2018 09:34	0:15:00	66.1	47.9	53.1	49.5	52.5
96	16/08/2018 09:49	0:15:00	69.5	48.1	52.4	49.7	51.4
97	16/08/2018 10:04	0:05:27	75.9	48.2	55.3	49.6	57.7

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Appendix C – Definitions

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DECIBEL - The ratio of sound pressures that we can hear is a ratio of 10^6 . A logarithmic measurement scale is therefore used for convenience. The resulting parameter is called the 'sound pressure level' (L_p) and the associated measurement unit is the decibel (dB). As the decibel is a logarithmic ratio, the laws of logarithmic addition and subtraction apply.

The threshold of normal hearing is in the region of 0 dB, and 140 dB is the threshold of pain.

A change of 1 dB is only perceptible under controlled conditions.

dB(A) - The unit generally used for measuring environmental, traffic or industrial noise is the A-weighted sound pressure level in decibels, denoted dB(A). An 'A'-weighting network can be built into a sound level measuring instrument such that sound levels in dB(A) can be read directly from a meter. The weighting is based on the frequency response of the human ear and has been found to correlate well with human subjective reactions to various sounds. A change of 3 dB(A) is the minimum perceptible under normal conditions, and a change of 10 dB(A) corresponds to a subjective halving or doubling of the loudness of a sound.

EQUIVALENT CONTINUOUS SOUND LEVEL (LEQ) - An index often used for the assessment of overall noise exposure is the equivalent continuous sound level, (LEQ). This is a notional steady level which would, over a given period of time, deliver the same sound energy as the actual time-varying sound over the same period. Hence fluctuating levels can be described in terms of a single figure level.

The 'A' weighted statistical sound level over a time period, T , is denoted $LA_{EQ,T}$.

AMBIENT NOISE - The total encompassing sound in a given situation at a given time. Most often described in terms of the index $LA_{EQ,T}$.

SPECIFIC NOISE ($LA_{EQ,T}$) - The equivalent continuous A-Weighted sound pressure level at the assessment position produced by the specific noise source over a time interval T .

STATISTICAL NOISE LEVELS - For levels of noise that vary widely with time, for example road traffic noise, it is necessary to employ an index which allows for this variation.

- The L_{10} , the level exceeded for ten per cent of the time period under consideration, has been adopted in this country for the assessment of road traffic noise.
- The L_{90} , the level exceeded for ninety per cent of the time, has been adopted to represent the background noise level.

'A' weighted statistical noise levels are generally used and are denoted LA_{10} , LA_{90} etc. The reference time period (T) is normally included, e.g. $LA_{10,T}$.

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