38A MONMOUTH STREET
LONDON
WC2H 9EP

24 HOUR ENVIRONMENTAL NOISE ASSESSMENT

Our Ref: CPT/271121/040/REV01

Written By:

Cliff Tucker AMIOA

Date: 4th December 2021

CONTENTS

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 we establish an acoustic design criterion (the Rating Level) at the site boundary.

1.3 We have excluded the following from our brief:

- Construction noise
- Any Building Regulations noise considerations
- Traffic noise/traffic count per se, though we have recorded LA10 percentiles.
- Health and safety acoustics.

2.0 Executive Summary

2.1 An Environmental Noise Assessment has been carried out at 38A Monmouth Street, London, WC2H 9EP.

2.2 A Minimum background noise level of 51 (51.4) dB $LA_{90,\ 15mins}$ has been measured for the proposed hours of use of the equipment.

2.3 A Rating Level is set at 10 dB below the relevant background noise levels, as per the normal conditions of the London Borough of Camden.

2.4 The noise rating limit at the closest noise sensitive receptors will therefore be 41 dB $LA_{r,T}$.

2.5 The calculated Rating Level of the equipment at 36 Monmouth Street (AP1) is 35 dB-A, which is 6 dB-A below the maximum permissible Rating Level and the Local Authority's requirements in terms of noise will therefore be met without recourse to additional noise mitigation measures.

2.6 The calculated Rating Level of the equipment at 10 Tower Court (AP2) is 37 dB-A, which is 4 dB-A below the maximum permissible Rating Level and the Local Authority's requirements in terms of noise will therefore be met without recourse to additional noise mitigation measures.

3.0 Location & Background

3.1 38A Monmouth Street is a four storey commercial/ retail property in a street of similar properties.

3.2 It is bounded by Tower Court to the North with 36 Monmouth Street, a mixed retail/ residential property beyond; Monmouth Street to the East with further mixed use property beyond; 40 Monmouth Street to the South, currently operating as the Two Brewers public house; and 10 Tower Court to the West, a residential property.

3.3 The property is undergoing refurbishment part of which includes the installation of three new external air conditioning condensers adjacent to an existing unit at roof top level.

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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 metre Extension Pole.
- Rion Weatherproof Security Box

4.2 The instruments carry current calibration certificates copies of which are available from our offices upon request.

5.0 Time, Date & Environmental Conditions

5.1 The survey was conducted between 10.25 on 22nd November 2021 through until 09.55 on 23rd November 2021.

5.2 The weather throughout the survey was overcast with only light rainfall and wind.

5.3 The site engineer was Cliff Tucker and the results were analysed & reported by Cliff Tucker.

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.

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 northern façade of the building and directly opposite the 4th floor residential apartments of 36 Monmouth Street.

6.6 The background level as measured at the microphone position is considered to be representative of the levels enjoyed at all neighbouring properties.

6.7 The closest noise sensitive receptors are the 4th floor residential windows of 36 Monmouth Street (AP1), located immediately to the North and the 4th floor windows of 10 Tower Court (AP2) located immediately to the West.

6.8 The Measurement Position; Assessment Position; 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 the specific noise level from any new plant in order to predict the likelihood of noise complaint.

6.12 The London Borough of Camden's requirements are for the Rating Level of the proposed equipment not to exceed the level 10 dB below the minimum external background noise level for the hours of operation for the plant.

6.13 As this is a commercial the equipment has the propensity to only operate from 07.00 to 19.00 hours.

7.0 Results Summary

7.1 The full set of measured levels are tabulated in Appendix ‘B’ of this report

7.2 The minimum background noise level for the proposed hours of use of the equipment was 51.4 dB $LA_{90,\ 15\ mins}$ and was measured at 06.55 and 07.10 on the 23rd November 2021.

7.3 The maximum permissible Rating Level at the closest noise sensitive receptors is therefore 41 dB $LA_{r,\ T}$.

8.0 Analysis

8.1 Proposed Plant & Location

The proposed items of plant are:

- 2 no. Toshiba RAS-3M18S3AV-E A/C Condenser.
- 1 no. Toshiba RAS-3M26S3AV-E A/C Condenser.

The equipment is to be located at roof top level adjacent to an existing air conditioning condenser.

The manufacturers published Sound Pressure Levels at 1 metre for the units under full load are as follows:

RAS-3M18S3AV-E	-	47 dB-A
RAS-3M26S3AV-E	-	48 dB-A

The plant noise has no tonal properties. Being inverter driven, there is no intermittency.

8.2 Acoustic Calculation – 36 Monmouth Street (AP1)

There is direct line of sight between the proposed installation location and the 4th floor windows of 36 Monmouth Street, a distance of not less than 7 m from the closest condenser.

RAS-3M18S3AV-E	-	47 dB-A
RAS-3M18S3AV-E	-	47 dB-A
RAS-3M26S3AV-E	-	48 dB-A
Cumulative	-	52 dB-A
Distance Loss	-	17 dB-A
Lp-A at AP1	-	35 dB-A

This is 6 dB-A below the maximum permissible Rating Level of 41 dB $LA_{r,T}$ and the Local Authority's requirements in terms of noise will therefore be met.

8.3 Acoustic Calculation – 10 Tower Court (AP2)

There is direct line of sight between the proposed installation location and the 4th floor windows of 10 Tower Court, a distance of not less than 3 m from the closest condenser and screened from direct line of sight by a parapet wall at rooftop level.

RAS-3M18S3AV-E	-	47 dB-A
RAS-3M18S3AV-E	-	47 dB-A

RAS-3M26S3AV-E	-	48 dB-A
Cumulative	-	52 dB-A
Distance Loss	-	10 dB-A
Screening	-	5 dB-A
Lp-A at AP1	-	37 dB-A

This is 4 dB-A below the maximum permissible Rating Level of 41 dB $LA_{r,T}$ and the Local Authority's requirements in terms of noise will therefore be met.

8.3 Vibration

As the proposed plant is to be located in close proximity to the neighbouring properties the unit should be resiliently mounted such that a vibration isolation efficiency of not less than 95% is achieved at full duty in order to prevent the transfer of vibration or structure borne noise to the neighbouring properties.

Additionally, the associated gas and liquid lines should be secured using fixings over the top of the thermal insulation to prevent direct metal to metal support.

9.0 Conclusion

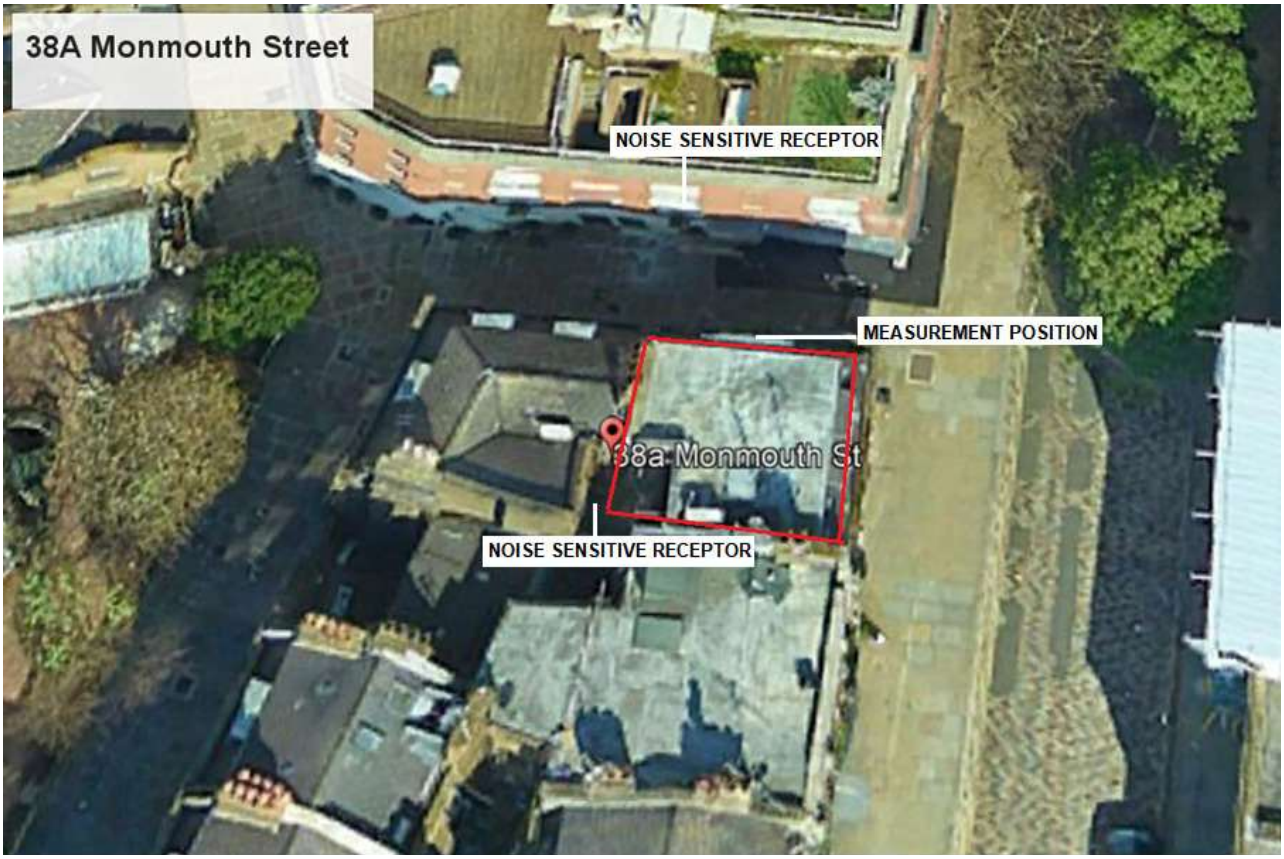
The new plant that is to be designed, selected, located & installed to ensure compliance with the above objectives.

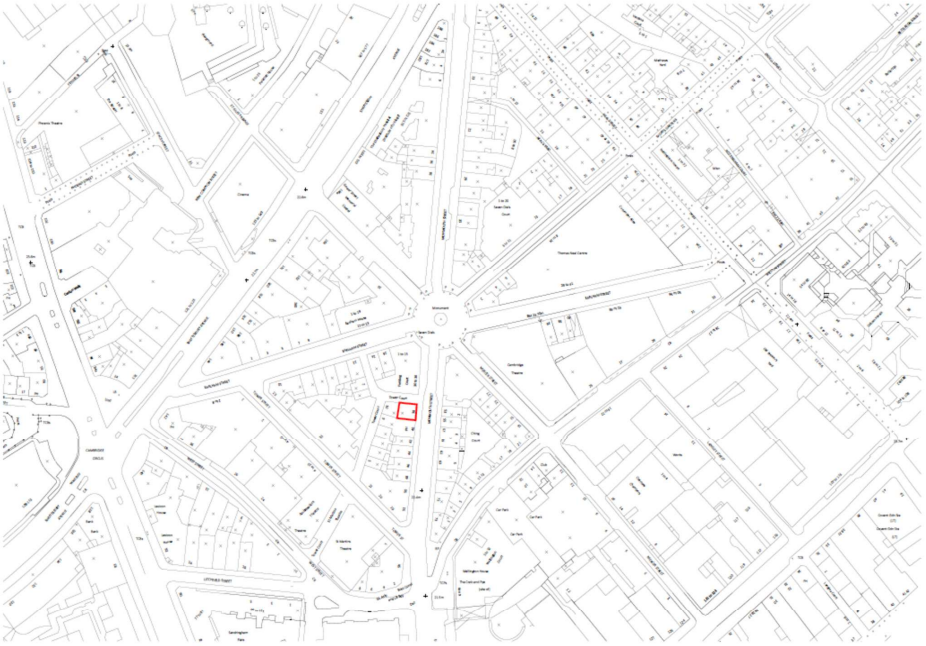
Assuming this is achieved as detailed above then the Local Authority's requirements in terms of noise will be met.

Report ends

Cliff Tucker AMIOA
Eurovib (Acoustic Products) Ltd

Appendix A – Positions, Distances, & Locations


38A Monmouth Street
NOISE SENSITIVE RECEPTOR
MEASUREMENT POSITION
38a Monmouth St
NOISE SENSITIVE RECEPTOR



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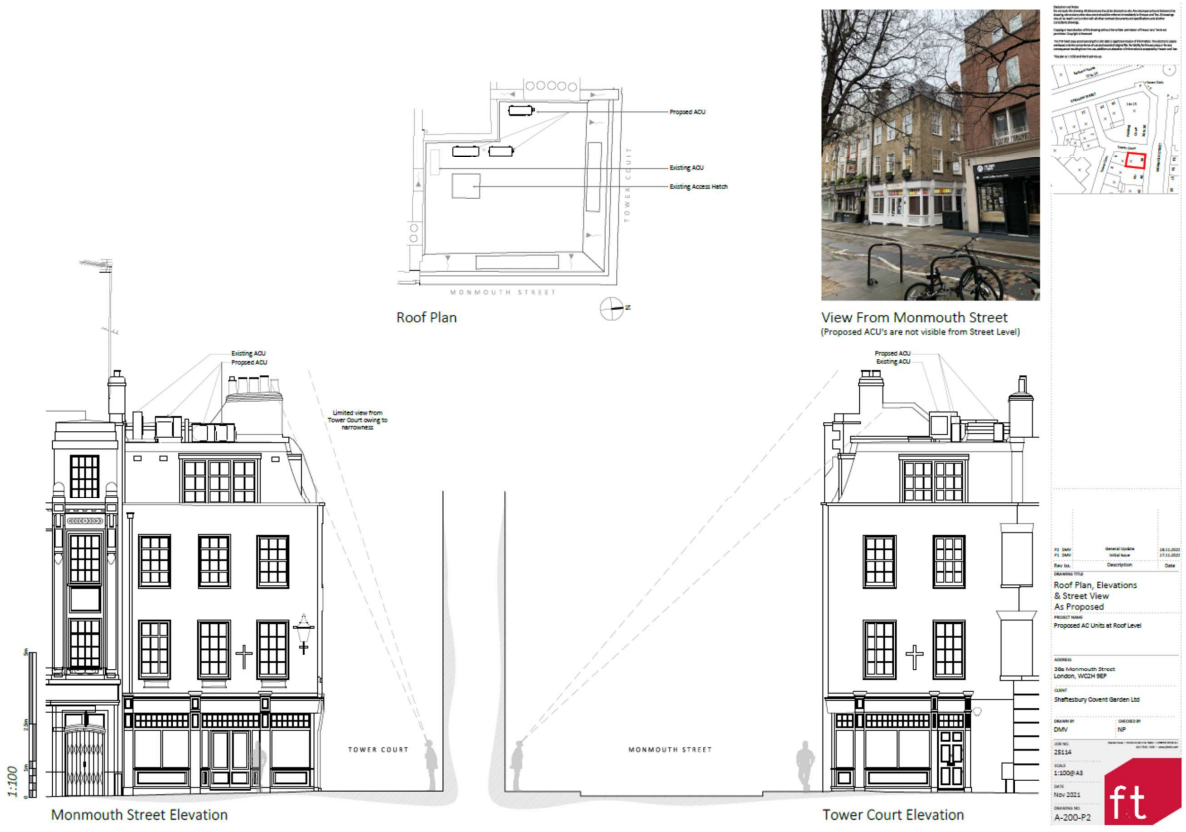

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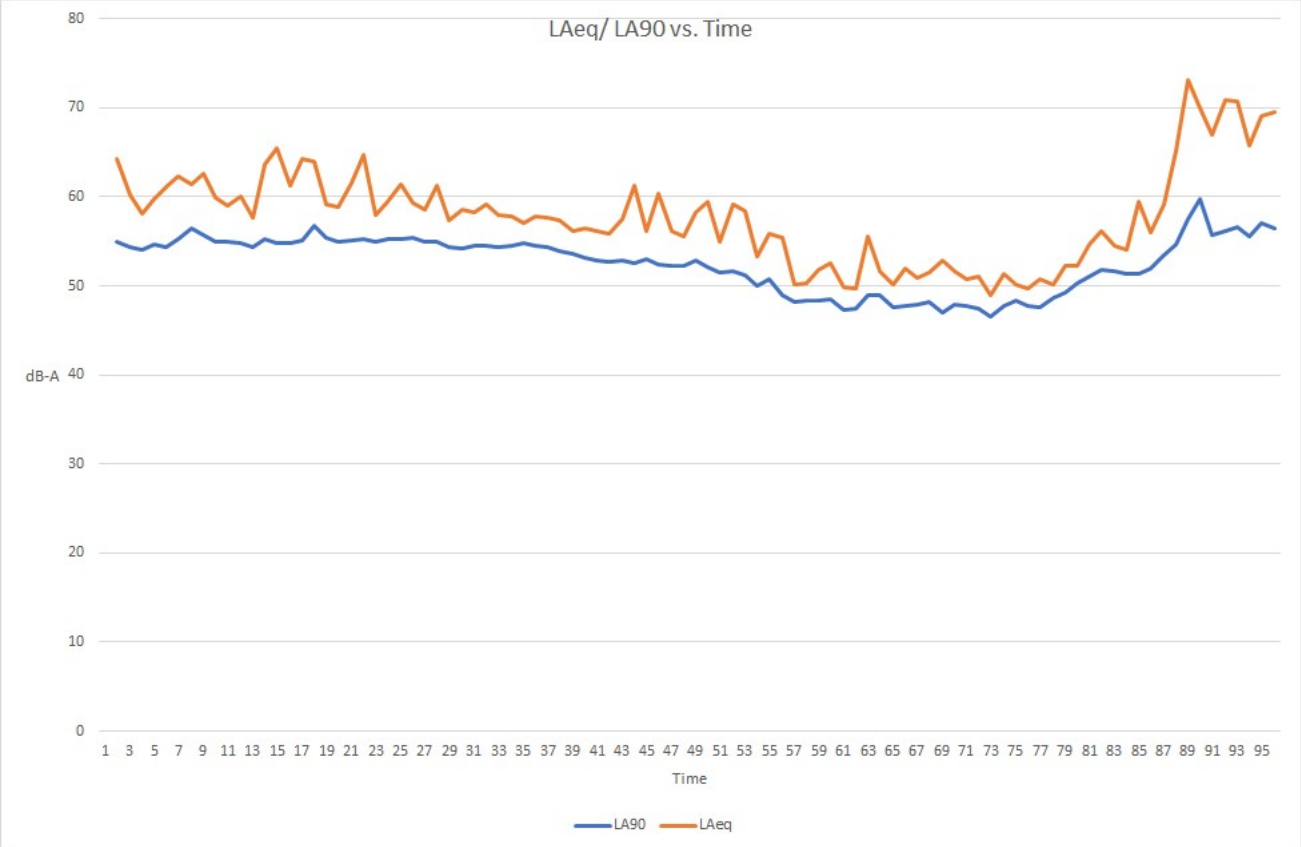
Appendix B – Full Measured Levels

Ref	Time	Measurment Time	LAmax	LAmin	LA10	LA90	LAeq
1	22/11/2021 10:25	0:15:00	91.7	44.2	63.8	55.0	64.3
2	22/11/2021 10:40	0:15:00	80.1	52.4	63.1	54.4	60.2
3	22/11/2021 10:55	0:15:00	78.3	51.9	60.5	54.0	58.1
4	22/11/2021 11:10	0:15:00	81.6	52.0	61.2	54.6	59.8
5	22/11/2021 11:25	0:15:00	84.5	52.4	63.2	54.4	61.1
6	22/11/2021 11:40	0:15:00	84.2	52.8	63.9	55.3	62.3
7	22/11/2021 11:55	0:15:00	81.9	52.8	63.6	56.4	61.4
8	22/11/2021 12:10	0:15:00	83.2	53.1	65.7	55.7	62.6
9	22/11/2021 12:25	0:15:00	81.1	53.0	61.1	54.9	59.9
10	22/11/2021 12:40	0:15:00	75.6	52.9	61.2	55.0	59.0
11	22/11/2021 12:55	0:15:00	79.3	52.7	61.2	54.8	60.1
12	22/11/2021 13:10	0:15:00	76.9	52.4	59.7	54.3	57.7
13	22/11/2021 13:25	0:15:00	84.4	53.3	62.9	55.3	63.7
14	22/11/2021 13:40	0:15:00	83.0	52.6	66.3	54.8	65.4
15	22/11/2021 13:55	0:15:00	80.9	52.1	62.8	54.8	61.2
16	22/11/2021 14:10	0:15:00	78.6	53.3	63.1	55.1	64.3
17	22/11/2021 14:25	0:15:00	77.6	53.5	64.0	56.7	64.0
18	22/11/2021 14:40	0:15:00	77.2	53.0	61.7	55.4	59.2
19	22/11/2021 14:55	0:15:00	75.5	52.8	61.3	54.9	58.9
20	22/11/2021 15:10	0:15:00	77.7	53.0	62.9	55.1	61.6
21	22/11/2021 15:25	0:15:00	79.9	53.1	64.1	55.2	64.7
22	22/11/2021 15:40	0:15:00	78.1	53.0	59.8	54.9	58.0
23	22/11/2021 15:55	0:15:00	78.7	53.1	61.4	55.2	59.4
24	22/11/2021 16:10	0:15:00	79.7	53.4	63.4	55.3	61.4
25	22/11/2021 16:25	0:15:00	77.2	53.1	61.0	55.4	59.3
26	22/11/2021 16:40	0:15:00	72.9	53.1	60.8	55.0	58.5
27	22/11/2021 16:55	0:15:00	76.4	53.1	64.1	54.9	61.3
28	22/11/2021 17:10	0:15:00	71.8	52.3	59.5	54.3	57.3
29	22/11/2021 17:25	0:15:00	77.5	52.1	60.3	54.2	58.6
30	22/11/2021 17:40	0:15:00	74.8	52.6	59.7	54.5	58.3
31	22/11/2021 17:55	0:15:00	86.7	52.3	60.5	54.5	59.2
32	22/11/2021 18:10	0:15:00	76.6	52.4	59.7	54.4	58.0
33	22/11/2021 18:25	0:15:00	75.9	52.6	60.0	54.5	57.8
34	22/11/2021 18:40	0:15:00	67.5	53.0	59.0	54.8	57.0
35	22/11/2021 18:55	0:15:00	73.9	52.7	60.1	54.5	57.8
36	22/11/2021 19:10	0:15:00	76.4	52.1	59.8	54.4	57.7
37	22/11/2021 19:25	0:15:00	70.4	52.2	59.3	53.9	57.3
38	22/11/2021 19:40	0:15:00	72.2	52.1	57.8	53.6	56.1
39	22/11/2021 19:55	0:15:00	70.2	51.1	58.4	53.1	56.4
40	22/11/2021 20:10	0:15:00	73.4	51.5	58.3	52.9	56.1
41	22/11/2021 20:25	0:15:00	72.7	51.3	57.9	52.7	55.8
42	22/11/2021 20:40	0:15:00	76.1	51.1	59.8	52.9	57.5
43	22/11/2021 20:55	0:15:00	80.1	50.8	58.6	52.6	61.2
44	22/11/2021 21:10	0:15:00	76.9	51.5	57.9	53.0	56.2
45	22/11/2021 21:25	0:15:00	83.0	50.6	63.9	52.4	60.3
46	22/11/2021 21:40	0:15:00	73.6	49.4	58.5	52.2	56.2
47	22/11/2021 21:55	0:15:00	71.9	49.9	57.7	52.2	55.5
48	22/11/2021 22:10	0:15:00	77.9	50.1	60.6	52.9	58.3

Ref	Time	Measurment Time	LAmax	LAmin	LA10	LA90	LAeq
49	22/11/2021 22:25	0:15:00	73.3	49.2	64.1	52.1	59.4
50	22/11/2021 22:40	0:15:00	69.2	49.2	57.3	51.5	54.9
51	22/11/2021 22:55	0:15:00	77.7	49.5	64.5	51.7	59.1
52	22/11/2021 23:10	0:15:00	73.9	49.1	63.3	51.2	58.4
53	22/11/2021 23:25	0:15:00	69.5	48.2	55.7	50.0	53.3
54	22/11/2021 23:40	0:15:00	68.3	49.2	59.3	50.8	55.9
55	22/11/2021 23:55	0:15:00	68.5	47.3	59.1	49.0	55.4
56	23/11/2021 00:10	0:15:00	63.0	46.7	51.5	48.2	50.1
57	23/11/2021 00:25	0:15:00	64.2	46.8	51.7	48.3	50.3
58	23/11/2021 00:40	0:15:00	71.7	47.0	52.9	48.4	51.8
59	23/11/2021 00:55	0:15:00	68.0	47.0	54.3	48.5	52.5
60	23/11/2021 01:10	0:15:00	67.3	45.5	51.2	47.3	49.8
61	23/11/2021 01:25	0:15:00	64.7	46.1	51.1	47.4	49.7
62	23/11/2021 01:40	0:15:00	73.8	47.4	58.3	48.9	55.5
63	23/11/2021 01:55	0:15:00	68.3	47.4	52.7	49.0	51.7
64	23/11/2021 02:10	0:15:00	63.4	46.2	51.3	47.6	50.2
65	23/11/2021 02:25	0:15:00	75.9	45.9	51.5	47.7	52.0
66	23/11/2021 02:40	0:15:00	71.5	46.4	52.7	47.9	50.9
67	23/11/2021 02:55	0:15:00	65.3	46.3	53.5	48.2	51.5
68	23/11/2021 03:10	0:15:00	73.5	45.3	53.7	47.0	52.8
69	23/11/2021 03:25	0:15:00	74.3	46.0	52.2	47.9	51.6
70	23/11/2021 03:40	0:15:00	64.2	46.4	53.1	47.8	50.7
71	23/11/2021 03:55	0:15:00	73.7	45.8	50.9	47.5	51.1
72	23/11/2021 04:10	0:15:00	64.1	45.2	50.5	46.6	48.9
73	23/11/2021 04:25	0:15:00	68.0	46.2	52.3	47.7	51.4
74	23/11/2021 04:40	0:15:00	63.8	46.9	51.9	48.4	50.2
75	23/11/2021 04:55	0:15:00	64.1	46.3	51.1	47.7	49.7
76	23/11/2021 05:10	0:15:00	70.7	45.9	52.4	47.6	50.8
77	23/11/2021 05:25	0:15:00	64.0	47.3	50.8	48.6	50.1
78	23/11/2021 05:40	0:15:00	67.5	47.5	53.8	49.3	52.2
79	23/11/2021 05:55	0:15:00	70.2	48.8	54.0	50.3	52.2
80	23/11/2021 06:10	0:15:00	70.2	49.7	55.9	51.1	54.7
81	23/11/2021 06:25	0:15:00	72.3	50.4	57.7	51.8	56.1
82	23/11/2021 06:40	0:15:00	65.3	49.5	56.6	51.7	54.5
83	23/11/2021 06:55	0:15:00	67.9	49.4	56.1	51.4	54.1
84	23/11/2021 07:10	0:15:00	78.2	49.8	58.2	51.4	59.5
85	23/11/2021 07:25	0:15:00	80.1	49.9	58.0	51.9	56.0
86	23/11/2021 07:40	0:15:00	81.8	50.7	60.2	53.4	59.1
87	23/11/2021 07:55	0:15:00	80.4	52.2	64.4	54.7	65.1
88	23/11/2021 08:10	0:15:00	84.2	53.4	78.1	57.5	73.1
89	23/11/2021 08:25	0:15:00	79.9	54.2	74.5	59.8	70.0
90	23/11/2021 08:40	0:15:00	84.5	52.9	69.6	55.7	66.9
91	23/11/2021 08:55	0:15:00	81.9	53.8	76.2	56.1	70.8
92	23/11/2021 09:10	0:15:00	81.6	53.9	75.7	56.6	70.7
93	23/11/2021 09:25	0:15:00	80.4	53.1	64.8	55.6	65.8
94	23/11/2021 09:40	0:15:00	79.5	53.9	75.2	57.1	69.0
95	23/11/2021 09:55	0:06:19	90.3	53.8	70.0	56.5	69.5


LAeq/ LA90 vs. Time
80
70
60
50
40
30
20
10
0
dB-A
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53 55 57 59 61 63 65 67 69 71 73 75 77 79 81 83 85 87 89 91 93 95
Time
LA90
LAeq

Appendix C – Definitions

DECIBEL - The ratio of sound pressures that we can hear is a ratio of 106. A logarithmic measurement scale is therefore used for convenience. The resulting parameter is called the 'sound pressure level' (Lp) 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 L10, 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 L90, 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. $LA_{10,\ 15\ mins}$.