7 A,B,C BAYHAM STREET, NW1

NOISE ASSESSMENT

VC-102839-EN-RP-0001
R00

6TH NOVEMBER 2018

VANGUARDIA

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1. INTRODUCTION

PROPOSED DEVELOPMENT

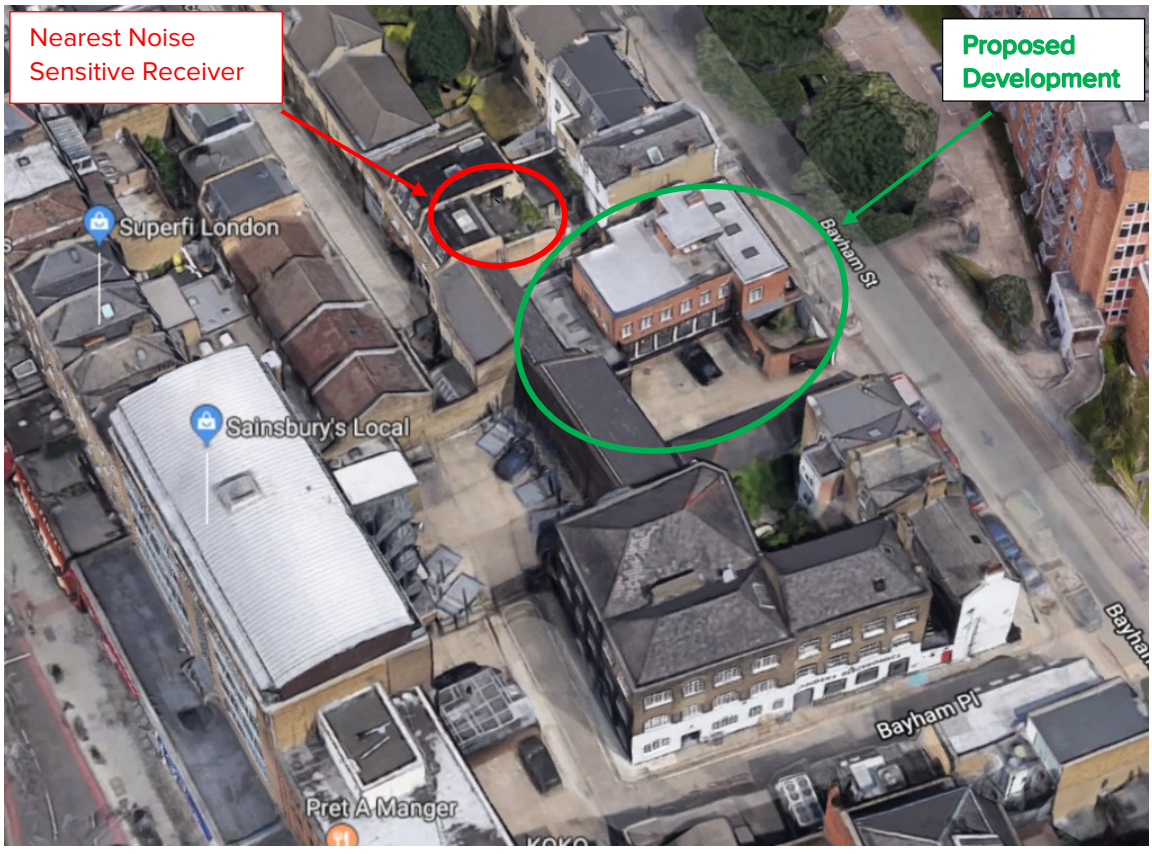
1.1. Planning application (Ref: 2018/3647/P) for a new commercial development was submitted to Camden Council on 10th August 2018 which comprises of; 'Demolition of existing office buildings (B1) and erection of 5 storey (plus two storey basement) building comprising mixed office (B1) and hotel (C1) use.'

1.2. A noise assessment has been undertaken in order to determine the environmental noise impact of the use of the proposed external courtyard included in the development proposals to its surroundings. A brief review of the limitations within the Sandy Brown noise report and the Construction Management Plan are also included in this document.

SITE LOCATION

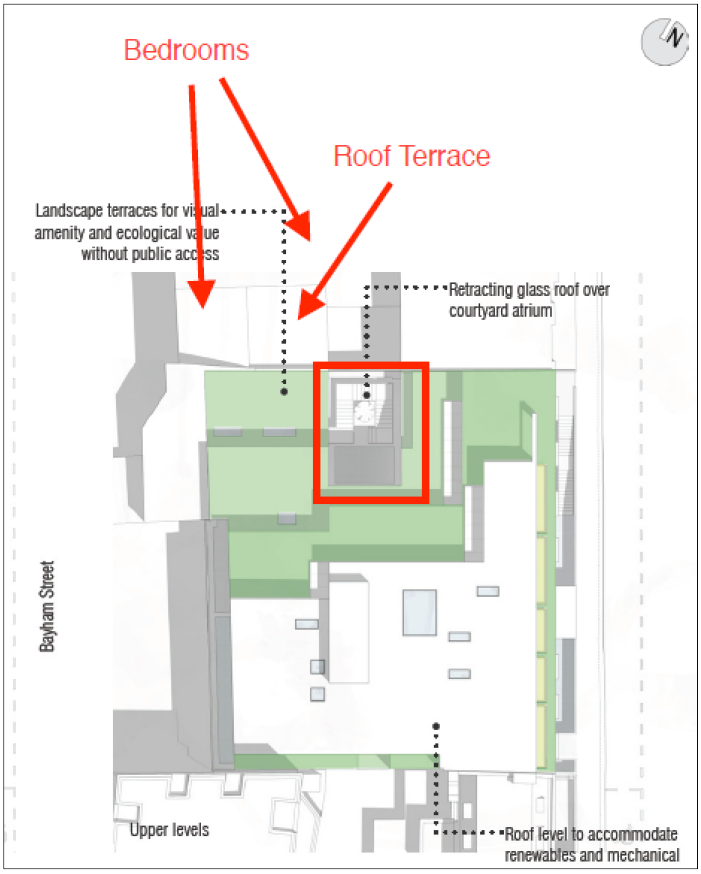
1.3. 7 A,B,C Bayham Street is currently classed as commercial space (i.e. offices) and comprises three buildings. It is bound by Camden High Street to the West, Crowndale Road to the South, Bayham Street to the East and King's Terrace and Plender Street to the North.

Figure 1 Google maps image showing the site



1.4. The proposed new development has been evaluated by Vanguardia and it has been concluded that the external area (courtyard) in the lower ground is the biggest risk of noise to the nearest noise sensitive receivers.

Figure 2 Proposed courtyard



EXISTING NOISE CLIMATE

1.5. The existing background noise climate, in the local vicinity of the proposed new commercial development, is comprised of a number of sources. The most notable of which is road traffic noise which diffracts over the top of the main building into the external/terrace areas, at the rear of the premises. This noise source is most prominent between 04.00 hrs to 24.00 midnight, 7-days-a-week.

1.6. Other lesser contributing sources include; aircraft noise and people noise, the latter of which emanates from both the street side of the premises and from nearby outdoor amenity spaces at the rear Camden High Street, Crowndale Road, Bayham Street, King's Terrace and Plender Street. An additional contributing noise source, in this case, was from construction works at 48-56 Bayham Place on weekdays and Saturday, during day-time period. (occurring at various times between 7:00 and 19:00)

2. ASSESSMENT CRITERIA

NATIONAL POLICY

2.1. The *National Planning Policy Framework* (NPPF) promotes the following environmental protection tenets:

2.1.1. The NPPF provides a set of overarching aims broadly reflecting those already covered in the *Noise Policy Statement for England* (NPSE) described below. They are directed towards the avoidance of significant adverse impacts and reduction of other adverse impacts on health and quality of life, set within the context of the Government's policy on sustainable development.

2.1.2. With regard to sustainable development, the NPPF requires that;

- *Where the development plan is absent, silent or relevant policies are out-of-date, permission should be granted unless any adverse impacts of doing so would significantly and demonstrably outweigh the benefits, when assessed against the policies in this Framework taken as a whole.*

2.2. The NPPF affirms that National Policy Statements form part of the overall framework of national planning policy, and should be a material consideration in decisions on planning applications. The *Noise Policy Statement for England* (NPSE) came into force in 2010 and states:

2.2.1. This Noise Policy Statement for England (NPSE) should apply to all forms of noise including environmental noise, neighbour noise and neighbourhood noise. The NPSE does not apply to noise in the workplace (i.e. occupational noise).

- Noise Policy Vision
  Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.
- Noise Policy Aims
  Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:
  avoid significant adverse impacts on health and quality of life;
  mitigate and minimise adverse impacts on health and quality of life; and;
  where possible, contribute to the improvement of health and quality of life.

WORLD HEALTH ORGANISATION

2.3. WHO – Guidelines for Community Noise 1999 recommend the following table (Table 1):

Table 1 Guideline values for community noise in specific environments

Specific environment	Critical health effect(s)	L_{Aeq} [dB(A)]	Time base [hours]	L_{Amax} fast [dB]
Outdoor living area	Serious annoyance, daytime and evening	55	16	-
	Moderate annoyance, daytime and evening	50	16	-
Dwelling, indoors	Speech intelligibility & moderate annoyance, daytime & evening	35	16	
Inside bedrooms	Sleep disturbance, night-time	30	8	45
Outside bedrooms	Sleep disturbance, window open (outdoor values)	45	8	60

2.4. WHO – Night Noise Guidelines for Europe 2009 stipulate the following (Table 2):

Table 2 Night noise guideline values for community noise

Description	*$L_{night,outside}$*
Night noise guideline (NNG)	*40dB*
Interim Target (IT)	*55dB*

2.5. WHO – Night Noise Guidelines for Europe 2009 further establish the following:

$L_{night,outside}$ is the night-time noise indicator (L_{night}) of Directive 2002/49/EC of 25 June 2002: the A-weighted long-term average sound level as defined in ISO 1996-2: 1987, determined over all the night periods of a year; in which: the night is eight hours (usually 23.00 – 07.00 local time), a year is a relevant year as regards the emission of sound and an average year as regards the meteorological circumstances, the incident sound is considered, the assessment point is the same as for L_{den}. See Official Journal of the European Communities, 18.7.2002, for more details.

2.6. WHO – Environmental Noise Guidelines for the European Region 2018 state the following:

For average noise exposure, the GDG conditionally recommends reducing the yearly average from all leisure noise sources combined to 70 dB LAeq,24h, as leisure noise above this level is associated with adverse health effects. The equal energy principle can be used to derive exposure limits for other time averages, which might be more practical in regulatory processes.

For single-event and impulse noise exposures, the GDG conditionally recommends following existing guidelines and legal regulations to limit the risk of increases in hearing impairment from leisure noise in both children and adults.

3. BASELINE NOISE SURVEY

MEASUREMENTS

3.1. The external background noise survey was conducted in accordance with the guidelines contained within British Standard; *BS7445-1:2003, Description and measurement of environmental noise. Guide to quantities and procedures*. The following sections describe the survey procedures in more detail.

3.2. Baseline noise measurements were taken in the roof terrace (level-2) of 4 King's Terrace as representative of those which would be incident on any noise-sensitive receiver (NSR) located relative to the installed external services equipment.

Figure 3 Image showing measurement point representing the nearest noise sensitive receiver location (4 King's Terrace external area)

3.3. An unattended survey period totalling 98No. hours was conducted, comprising both a weekday and weekend period, to quantify baseline external noise levels over consecutive 15-minute intervals. Measurements were taken using an integrating sound level meter conforming to "Class

1" performance (according to British Standard; *BS EN 61672-1:2013 Electroacoustics. Sound level meters. Specifications*).

3.4. All noise measurements are quantified relative to a reference sound pressure of $2x10^{-5}$ Pa and taken using the "Fast" (125 ms) time-weighting only. Definitions of measured noise indices are included in Appendix B.

TIME AND DATE OF SURVEY

3.5. The baseline (background) noise survey data was obtained from survey commencing at 10:30 hrs on Thursday 11th October 2018 and ending at 12:45 hrs on Monday 15th October 2018 for a total survey duration of approx. 98-hours.

MEASUREMENT LOCATION

3.6. Appendix A identifies the following measurement location as detailed below:

- The microphone, was positioned 1.5 metres above roof terrace level, located on the South East-facing rear facade of 4 King's Terrace.
- The microphone was positioned more than 1 metre away from any vertical reflecting surfaces and is thereby considered to be under "Free-Field" conditions.

WEATHER CONDITIONS

3.7. Specific weather conditions that are disruptive for baseline noise survey (high rate of precipitation and accumulation, with wind-speed exceeding 5 m/s) occurred during the following dates during the survey;

- Sunday 14th October from 06:00hrs to Monday 15th October at 08:30hrs;

3.8. Noise data from the aforementioned periods which comprise inclement weather conditions, have been excluded from the assessment (See appendix A -numbers highlighted in grey)

SURROUNDING CONDITIONS

3.9. It should be noted that at the time of this survey, there was an ongoing construction at 48-56 Bayham Place. It has been observed to be the dominant noise source for the day-time period of weekdays and Saturday. This impact has been excluded from the assessment.

Figure 4 Image showing survey microphone location in relation to the to the construction site (48-56 Bayham Place)

INSTRUMENTATION

3.10. *Larson-Davis* LxT Sound Expert (serial no. 5600) was used in conjunction with a *Larson-Davis* PRMLxT1L (serial no. 55668) preamplifier and a *PCB Piezotronics 377B02* (serial no. 305272) condenser microphone (1/2-inch).

3.11. The microphone was fitted with proprietary, all-weather protection kits of which the effect on the frequency response up to 10 kHz is negligible.

3.12. The instrument was calibrated before and after the survey to a sound pressure level of 114.0 dBZ (±0.2 dB) with no significant drifts in calibration detected. *Larson-Davis* CAL-200 (Serial no: 11097) Field Calibrators have been used.

3.13. All field calibrators conform to "Class 1" operation, in accordance with British Standard; *BS EN 60942:2003 Electroacoustics. Sound Calibrators*.

SURVEY DATA

3.14. Baseline noise survey data is included in Appendix A with the following noise indices extracted from the raw survey data:

- $L_{Aeq,15\text{-mins}}$
- $L_{AF90,15\text{-mins}}$

RESULTS

3.15. The data in the appendix is presented in terms of the broadband (i.e. overall) A-weighted, 15-minute interval measurements taken during the survey period. Table 3 below shows the typical $L_{AF90,15\text{-mins}}$ levels over evening and night-time periods, presented as an overall, broadband noise level.

Table 3 Summary of the lowest measured background noise levels ($L_{AF90,15\text{-min}}$) (dB re: $2x10^{-5}$ Pa)

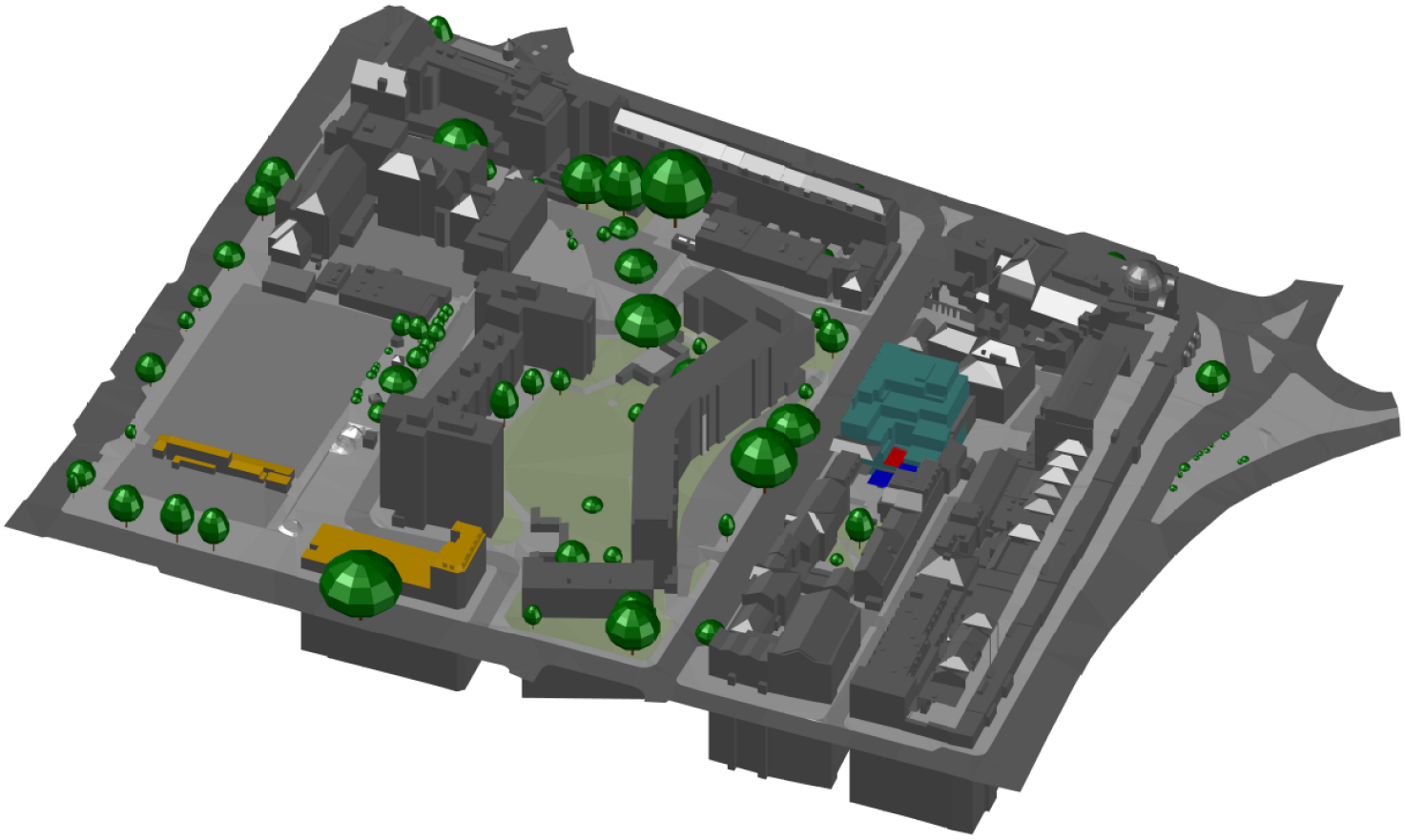
Measurement period	Interval duration	Measured Typical Sound Pressure Level ($L_{AF90,15\text{-min}}$)
Evening (19:00-23:00)	15-mins	47 dB
Night-time (23:00-07:00)	15-mins	43 dB

4. MODELLING

4.1. Detailed computer modelling has been undertaken to simulate the proposed courtyard in 7 A,B,C Bayham Street and its surroundings.

4.2. Architectural masterplan and google maps images have been taken as basis of design for 3D model.

Figure 5 Architectural masterplan (proposed development shown in teal/green, noise sensitive receiver points shown in blue and courtyard marked in red)



4.3. Predictions were carried out using IMMI 2015 3D noise modelling software utilising methodology from the international standard ISO 9613 parts 1 and 2.

SOURCE LEVELS

4.4. The source level used for the courtyard crowd noise has been extracted from the American National Standards Institute (ANSI 3.5 - 1997) Methods for Calculation of the Speech Intelligibility Index. (Note that individual Speech Levels are given in Octave Bands but these have been corrected to represent two persons speaking simultaneously). The category 'Loud' has been used for this assessment.

Table 4 ANSI 3.5 Levels with directivity correction added to demonstrate 2 people talking

ANSI 3.5 (with correction)										
	Frequency (Hz)	63	125	250	500	1000	2000	4000	8000	A weighted
Loud	SPL at 1m			65.1	71.2	71.5	66.1	60.0	48,9	74.3

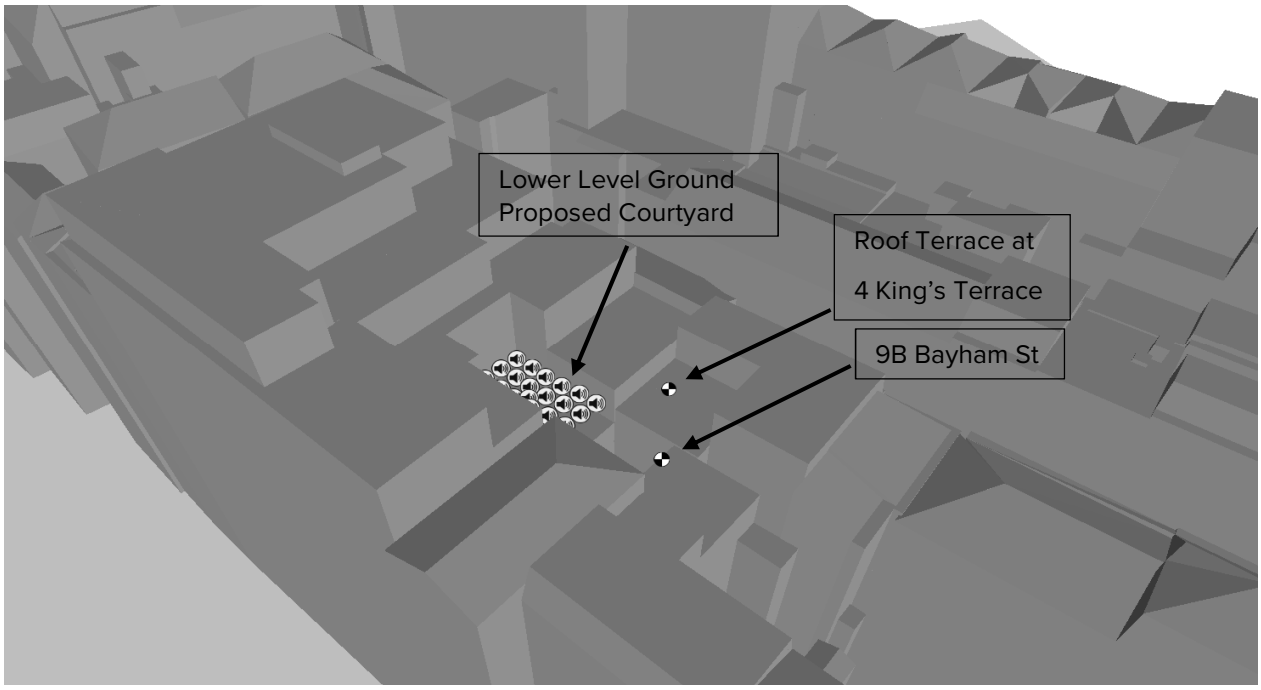
4.5. Courtyard has been modelled in full capacity (estimated to be 25 people) to demonstrate the worst-case scenario.

NEAREST NOISE SENSITIVE RECEIVERS

4.6. Main noise sensitive receiver point has been chosen as 4 King's Terrace due to its proximity. A second noise sensitive receiver has been chosen as 9B Bayham Street.

4.7. 4 King's Terrace also represents the baseline noise survey location. (See section 3)

Figure 6 Image of IMMI 2015 3D noise model



RESULTS

4.8. Table 4 demonstrates the predictions from IMMI Modelling.

Table 5 IMMI Modelling predictions at nearest noise sensitive receiver locations

Location	Distance from Proposed Courtyard (m)	Predicted Sound Pressure Levels (dBA)
Roof terrace at 4 King's Terrace	7.4	62
9B Bayham St	8	61.5

5. ASSESSMENT

5.1. Table 7 compares noise impact assessment

- Baseline noise survey results,
- Modelling predictions and
- WHO Criteria

for the evening and night-time periods.

Table 7 Summary and comparison of noise impact assessment prediction, baseline noise survey results and WHO Criteria

Baseline Noise Survey Results			
Measurement period	**Measured Typical Sound Pressure Level (LAF90,15-min) (dB)**	**IMMI Predicted Sound Pressure Level (dBA)**	**WHO Criteria (for outdoor living area) (dBA)**
Evening (19:00-23:00)	47	63	55
Night-time (23:00-07:00)	43	63	55

5.2. Based on the comparison of table 7, columns 2 and 3, it has been concluded that the predicted sound pressure levels from the proposed courtyard will be 16 to 20 dB above background noise levels of the existing noise climate. This is a significant change to the noise climate and will be disturbing to residents aiming to enjoy their outside terrace area.

5.3. Table 7 also indicates (by comparison of columns 3 and 4) that, the predicted sound pressure levels from the proposed courtyard area will be 8 dB above World Health Organisation noise guidelines for serious annoyance. This therefore also indicates that serious annoyance is likely to occur at the roof terrace area.

5.4. It should be noted that even if there were half as many people in the courtyard (only 12) then the WHO guideline for serious annoyance would be exceeded.

5.5. In summary, the proposed new development (specifically the external courtyard area) carries a serious risk of noise impact to its neighbourhood.

6. OTHER NOISE INFORMATION

6.1. Several references related to noise and vibration have been included by the applicant within the planning portal. These include:-

- The Sandy Brown Report 'Planning, Noise and Vibration report, 18095-R01-B, dated 26 July 2018.
- The framework Construction Management Plan by Ensphere Group ltd, July 2018.

THE SANDY BROWN REPORT

6.2. The Sandy Brown (SB) report, records similar background levels to those recorded by Vanguardia but their report deals solely with the assessment of plant noise. The report concludes that the plant adopted will meet the local authority guidelines, but no specific predictions have been carried out to show that the specific plant to be installed will meet the council limits.

6.3. The SB report does NOT include any assessment of noise from the courtyard and takes no account of any predictions and assessment of noise and vibration from construction. These issues appear to have been specifically excluded from their report.

THE CONSTRUCTION MANAGEMENT PLAN (CMP)

6.4. The CMP is very general in nature and provides no prediction of the construction noise and vibration. Camden Council specifically request this information. Item 30 states *'Please provide predictions of noise and vibration throughout these works.*' The CMP simply refers to the Noise Survey which presumably means the SB report which as stated provides NO predictions or assessment of construction noise.

6.5. The CMP also fails to provide any noise monitoring limits (this is most unusual) which again gives no comfort to local residents.

7. SUMMARY

7.1. The predicted noise from the proposed new development courtyard is well above the WHO noise guidance for serious disturbance outside. It is also well above the existing background noise level.

7.2. The Noise report by Sandy Brown included in the application is only limited to the assessment of plant noise and vibration and does not included any assessment of the courtyard noise or the construction noise and vibration impact.

7.3. The Construction Noise Management Plan is very vague and does not provide any noise prediction or assessment of the construction activities as required by Camden Council. Its only reference is to the noise survey (Sandy Brown report) which does not provide an assessment of construction noise and vibration.

8. APPENDIX A

BASELINE NOISE SURVEY RESULTS

Record #	Date	Time	LAeq (dB)	LAF90.00 (dB)
1	2018-10-11	10:30:00	64.4	52.4
2	2018-10-11	10:45:00	59.4	50.5
3	2018-10-11	11:00:00	54.8	47.1
4	2018-10-11	11:15:00	55.1	47.1
5	2018-10-11	11:30:00	56.7	49.7
6	2018-10-11	11:45:00	60.2	50.5
7	2018-10-11	12:00:00	59.0	50.6
8	2018-10-11	12:15:00	59.6	50.2
9	2018-10-11	12:30:00	57.0	49.9
10	2018-10-11	12:45:00	56.4	49.9
11	2018-10-11	13:00:00	53.9	49.3
12	2018-10-11	13:15:00	58.4	49.4
13	2018-10-11	13:30:00	59.4	50.1
14	2018-10-11	13:45:00	55.7	50.2
15	2018-10-11	14:00:00	55.0	49.0
16	2018-10-11	14:15:00	57.3	48.8
17	2018-10-11	14:30:00	62.2	52.6
18	2018-10-11	14:45:00	62.2	50.6
19	2018-10-11	15:00:00	54.0	48.6
20	2018-10-11	15:15:00	59.7	48.5
21	2018-10-11	15:30:00	58.0	48.5
22	2018-10-11	15:45:00	59.7	49.1
23	2018-10-11	16:00:00	57.4	48.7
24	2018-10-11	16:15:00	54.8	49.1
25	2018-10-11	16:30:00	54.9	48.2
26	2018-10-11	16:45:00	59.7	48.5
27	2018-10-11	17:00:00	52.0	46.8
28	2018-10-11	17:15:00	51.4	47.0
29	2018-10-11	17:30:00	52.6	47.7
30	2018-10-11	17:45:00	51.1	47.1
31	2018-10-11	18:00:00	56.7	46.8
32	2018-10-11	18:15:00	51.4	46.5
33	2018-10-11	18:30:00	51.8	46.1
34	2018-10-11	18:45:00	51.7	46.6
35	2018-10-11	19:00:00	52.5	48.4
36	2018-10-11	19:15:00	53.0	47.2
37	2018-10-11	19:30:00	50.8	45.8
38	2018-10-11	19:45:00	51.0	46.6
39	2018-10-11	20:00:00	50.7	45.7
40	2018-10-11	20:15:00	51.2	45.7

41	2018-10-11	20:30:00	51.7	46.2
42	2018-10-11	20:45:00	50.1	45.5
43	2018-10-11	21:00:00	51.2	45.4
44	2018-10-11	21:15:00	51.8	45.9
45	2018-10-11	21:30:00	49.9	45.4
46	2018-10-11	21:45:00	50.1	45.6
47	2018-10-11	22:00:00	50.2	45.3
48	2018-10-11	22:15:00	51.8	45.5
49	2018-10-11	22:30:00	51.9	45.3
50	2018-10-11	22:45:00	48.8	44.5
51	2018-10-11	23:00:00	48.8	44.7
52	2018-10-11	23:15:00	49.5	44.4
53	2018-10-11	23:30:00	50.6	43.9
54	2018-10-11	23:45:00	48.8	43.9
55	2018-10-12	00:00:00	48.7	43.4
56	2018-10-12	00:15:00	47.5	42.7
57	2018-10-12	00:30:00	48.9	42.7
58	2018-10-12	00:45:00	48.2	42.5
59	2018-10-12	01:00:00	48.5	42.5
60	2018-10-12	01:15:00	48.8	42.3
61	2018-10-12	01:30:00	48.5	42.2
62	2018-10-12	01:45:00	46.5	41.0
63	2018-10-12	02:00:00	47.5	41.6
64	2018-10-12	02:15:00	45.8	40.3
65	2018-10-12	02:30:00	47.8	40.3
66	2018-10-12	02:45:00	44.8	39.6
67	2018-10-12	03:00:00	46.2	39.8
68	2018-10-12	03:15:00	45.7	39.7
69	2018-10-12	03:30:00	46.0	40.4
70	2018-10-12	03:45:00	46.4	40.3
71	2018-10-12	04:00:00	46.7	40.9
72	2018-10-12	04:15:00	46.2	40.5
73	2018-10-12	04:30:00	46.5	40.7
74	2018-10-12	04:45:00	45.9	40.8
75	2018-10-12	05:00:00	47.0	41.5
76	2018-10-12	05:15:00	48.0	42.7
77	2018-10-12	05:30:00	47.3	42.9
78	2018-10-12	05:45:00	48.1	43.5
79	2018-10-12	06:00:00	49.7	45.3
80	2018-10-12	06:15:00	49.8	44.6
81	2018-10-12	06:30:00	49.7	45.3
82	2018-10-12	06:45:00	50.9	45.8
83	2018-10-12	07:00:00	51.0	46.0
84	2018-10-12	07:15:00	50.2	46.2
85	2018-10-12	07:30:00	52.5	47.9
86	2018-10-12	07:45:00	53.4	48.6

87	2018-10-12	08:00:00	53.5	48.3
88	2018-10-12	08:15:00	56.9	49.3
89	2018-10-12	08:30:00	56.7	50.0
90	2018-10-12	08:45:00	57.7	49.7
91	2018-10-12	09:00:00	61.0	50.4
92	2018-10-12	09:15:00	60.4	50.8
93	2018-10-12	09:30:00	55.7	50.1
94	2018-10-12	09:45:00	60.4	50.1
95	2018-10-12	10:00:00	57.4	50.8
96	2018-10-12	10:15:00	60.9	50.3
97	2018-10-12	10:30:00	62.8	53.0
98	2018-10-12	10:45:00	61.8	52.3
99	2018-10-12	11:00:00	56.3	49.6
100	2018-10-12	11:15:00	55.2	49.0
101	2018-10-12	11:30:00	59.9	50.2
102	2018-10-12	11:45:00	61.3	51.9
103	2018-10-12	12:00:00	61.4	52.1
104	2018-10-12	12:15:00	59.8	50.6
105	2018-10-12	12:30:00	60.7	51.1
106	2018-10-12	12:45:00	61.9	52.4
107	2018-10-12	13:00:00	62.7	53.1
108	2018-10-12	13:15:00	62.2	51.9
109	2018-10-12	13:30:00	62.9	51.8
110	2018-10-12	13:45:00	63.1	52.3
111	2018-10-12	14:00:00	60.0	51.3
112	2018-10-12	14:15:00	65.6	51.9
113	2018-10-12	14:30:00	64.7	52.5
114	2018-10-12	14:45:00	65.2	51.7
115	2018-10-12	15:00:00	57.3	50.2
116	2018-10-12	15:15:00	54.5	49.5
117	2018-10-12	15:30:00	56.5	49.7
118	2018-10-12	15:45:00	61.5	50.9
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121	2018-10-12	16:30:00	59.4	50.3
122	2018-10-12	16:45:00	55.4	49.4
123	2018-10-12	17:00:00	52.6	49.2
124	2018-10-12	17:15:00	53.1	49.0
125	2018-10-12	17:30:00	54.4	48.3
126	2018-10-12	17:45:00	52.8	48.4
127	2018-10-12	18:00:00	58.7	48.8
128	2018-10-12	18:15:00	53.6	49.5
129	2018-10-12	18:30:00	53.4	49.2
130	2018-10-12	18:45:00	54.2	49.4
131	2018-10-12	19:00:00	53.8	48.9
132	2018-10-12	19:15:00	54.4	49.3

133	2018-10-12	19:30:00	52.6	48.2
134	2018-10-12	19:45:00	51.9	48.5
135	2018-10-12	20:00:00	52.7	47.4
136	2018-10-12	20:15:00	52.8	47.7
137	2018-10-12	20:30:00	50.7	46.8
138	2018-10-12	20:45:00	53.0	47.4
139	2018-10-12	21:00:00	51.4	47.4
140	2018-10-12	21:15:00	51.2	47.7
141	2018-10-12	21:30:00	51.3	46.9
142	2018-10-12	21:45:00	50.9	47.0
143	2018-10-12	22:00:00	52.3	48.1
144	2018-10-12	22:15:00	51.5	47.9
145	2018-10-12	22:30:00	52.4	47.5
146	2018-10-12	22:45:00	51.1	46.8
147	2018-10-12	23:00:00	51.9	46.8
148	2018-10-12	23:15:00	51.6	47.3
149	2018-10-12	23:30:00	51.2	47.2
150	2018-10-12	23:45:00	51.5	47.3
151	2018-10-13	00:00:00	52.1	46.4
152	2018-10-13	00:15:00	49.8	45.2
153	2018-10-13	00:30:00	50.5	45.9
154	2018-10-13	00:45:00	50.3	45.8
155	2018-10-13	01:00:00	50.5	46.2
156	2018-10-13	01:15:00	50.1	45.1
157	2018-10-13	01:30:00	49.1	44.2
158	2018-10-13	01:45:00	49.3	44.7
159	2018-10-13	02:00:00	50.1	44.3
160	2018-10-13	02:15:00	49.2	44.5
161	2018-10-13	02:30:00	51.3	43.9
162	2018-10-13	02:45:00	48.9	43.5
163	2018-10-13	03:00:00	48.2	43.0
164	2018-10-13	03:15:00	48.8	42.5
165	2018-10-13	03:30:00	47.6	42.6
166	2018-10-13	03:45:00	47.5	42.6
167	2018-10-13	04:00:00	47.5	42.1
168	2018-10-13	04:15:00	46.2	41.5
169	2018-10-13	04:30:00	47.7	42.0
170	2018-10-13	04:45:00	46.1	41.9
171	2018-10-13	05:00:00	46.5	42.4
172	2018-10-13	05:15:00	47.9	42.5
173	2018-10-13	05:30:00	47.2	41.9
174	2018-10-13	05:45:00	46.9	42.2
175	2018-10-13	06:00:00	48.0	42.9
176	2018-10-13	06:15:00	48.4	43.7
177	2018-10-13	06:30:00	47.8	43.9
178	2018-10-13	06:45:00	48.2	43.8

179	2018-10-13	07:00:00	50.0	44.4
180	2018-10-13	07:15:00	48.7	44.6
181	2018-10-13	07:30:00	50.4	44.7
182	2018-10-13	07:45:00	50.4	45.2
183	2018-10-13	08:00:00	53.7	45.7
184	2018-10-13	08:15:00	51.2	47.0
185	2018-10-13	08:30:00	55.6	47.8
186	2018-10-13	08:45:00	59.5	48.8
187	2018-10-13	09:00:00	58.7	48.4
188	2018-10-13	09:15:00	60.8	47.6
189	2018-10-13	09:30:00	62.5	49.2
190	2018-10-13	09:45:00	64.5	49.6
191	2018-10-13	10:00:00	62.7	49.7
192	2018-10-13	10:15:00	64.4	49.2
193	2018-10-13	10:30:00	63.2	49.4
194	2018-10-13	10:45:00	60.9	48.4
195	2018-10-13	11:00:00	54.6	46.6
196	2018-10-13	11:15:00	56.0	46.8
197	2018-10-13	11:30:00	56.2	47.0
198	2018-10-13	11:45:00	61.8	48.8
199	2018-10-13	12:00:00	62.3	49.2
200	2018-10-13	12:15:00	62.1	49.5
201	2018-10-13	12:30:00	58.9	50.5
202	2018-10-13	12:45:00	55.4	48.1
203	2018-10-13	13:00:00	51.5	47.3
204	2018-10-13	13:15:00	52.2	47.5
205	2018-10-13	13:30:00	52.8	47.9
206	2018-10-13	13:45:00	51.9	46.9
207	2018-10-13	14:00:00	51.1	46.9
208	2018-10-13	14:15:00	54.5	47.3
209	2018-10-13	14:30:00	54.2	47.8
210	2018-10-13	14:45:00	53.2	48.1
211	2018-10-13	15:00:00	53.6	47.8
212	2018-10-13	15:15:00	54.5	47.8
213	2018-10-13	15:30:00	53.4	49.1
214	2018-10-13	15:45:00	57.1	47.6
215	2018-10-13	16:00:00	57.2	47.1
216	2018-10-13	16:15:00	52.4	47.9
217	2018-10-13	16:30:00	52.7	48.4
218	2018-10-13	16:45:00	53.6	47.8
219	2018-10-13	17:00:00	52.3	47.2
220	2018-10-13	17:15:00	54.4	46.7
221	2018-10-13	17:30:00	51.4	47.0
222	2018-10-13	17:45:00	51.1	46.2
223	2018-10-13	18:00:00	51.1	46.5
224	2018-10-13	18:15:00	57.0	46.3

225	2018-10-13	18:30:00	51.0	46.5
226	2018-10-13	18:45:00	51.1	46.9
227	2018-10-13	19:00:00	50.8	46.4
228	2018-10-13	19:15:00	52.9	46.6
229	2018-10-13	19:30:00	50.5	46.9
230	2018-10-13	19:45:00	50.3	46.7
231	2018-10-13	20:00:00	50.4	46.4
232	2018-10-13	20:15:00	50.2	46.2
233	2018-10-13	20:30:00	50.1	46.1
234	2018-10-13	20:45:00	52.0	46.8
235	2018-10-13	21:00:00	50.3	46.3
236	2018-10-13	21:15:00	50.4	46.8
237	2018-10-13	21:30:00	50.9	47.3
238	2018-10-13	21:45:00	50.7	46.9
239	2018-10-13	22:00:00	50.5	46.5
240	2018-10-13	22:15:00	49.7	46.0
241	2018-10-13	22:30:00	49.6	46.0
242	2018-10-13	22:45:00	50.0	45.9
243	2018-10-13	23:00:00	50.7	47.2
244	2018-10-13	23:15:00	49.5	45.8
245	2018-10-13	23:30:00	50.6	46.7
246	2018-10-13	23:45:00	50.9	46.5
247	2018-10-14	00:00:00	49.6	45.0
248	2018-10-14	00:15:00	51.2	46.1
249	2018-10-14	00:30:00	50.1	45.0
250	2018-10-14	00:45:00	49.1	44.7
251	2018-10-14	01:00:00	49.3	43.7
252	2018-10-14	01:15:00	48.3	43.9
253	2018-10-14	01:30:00	48.9	43.2
254	2018-10-14	01:45:00	48.2	43.2
255	2018-10-14	02:00:00	48.1	43.3
256	2018-10-14	02:15:00	49.0	43.2
257	2018-10-14	02:30:00	48.5	42.7
258	2018-10-14	02:45:00	47.9	41.8
259	2018-10-14	03:00:00	48.3	41.4
260	2018-10-14	03:15:00	47.8	41.3
261	2018-10-14	03:30:00	45.8	40.7
262	2018-10-14	03:45:00	45.9	40.0
263	2018-10-14	04:00:00	46.5	40.6
264	2018-10-14	04:15:00	45.2	39.9
265	2018-10-14	04:30:00	46.6	39.5
266	2018-10-14	04:45:00	44.3	39.0
267	2018-10-14	05:00:00	45.8	40.0
268	2018-10-14	05:15:00	45.5	39.9
269	2018-10-14	05:30:00	50.3	40.5
270	2018-10-14	05:45:00	48.0	42.8

271	2018-10-14	06:00:00	47.7	41.8
272	2018-10-14	06:15:00	51.9	43.4
273	2018-10-14	06:30:00	57.7	54.3
274	2018-10-14	06:45:00	52.7	44.6
275	2018-10-14	07:00:00	50.9	41.8
276	2018-10-14	07:15:00	51.4	44.2
277	2018-10-14	07:30:00	49.4	42.0
278	2018-10-14	07:45:00	51.0	42.7
279	2018-10-14	08:00:00	49.5	42.3
280	2018-10-14	08:15:00	52.3	42.0
281	2018-10-14	08:30:00	52.5	44.5
282	2018-10-14	08:45:00	51.7	44.1
283	2018-10-14	09:00:00	52.4	44.1
284	2018-10-14	09:15:00	52.8	45.9
285	2018-10-14	09:30:00	56.4	44.2
286	2018-10-14	09:45:00	51.1	44.7
287	2018-10-14	10:00:00	49.4	43.3
288	2018-10-14	10:15:00	50.0	44.0
289	2018-10-14	10:30:00	49.7	43.9
290	2018-10-14	10:45:00	49.6	43.8
291	2018-10-14	11:00:00	48.7	43.5
292	2018-10-14	11:15:00	53.2	43.9
293	2018-10-14	11:30:00	49.5	44.3
294	2018-10-14	11:45:00	55.0	45.7
295	2018-10-14	12:00:00	53.4	48.0
296	2018-10-14	12:15:00	52.4	47.6
297	2018-10-14	12:30:00	52.0	46.9
298	2018-10-14	12:45:00	52.4	46.2
299	2018-10-14	13:00:00	51.7	46.0
300	2018-10-14	13:15:00	51.7	46.1
301	2018-10-14	13:30:00	51.6	45.9
302	2018-10-14	13:45:00	51.3	46.8
303	2018-10-14	14:00:00	51.5	46.7
304	2018-10-14	14:15:00	52.2	46.7
305	2018-10-14	14:30:00	51.9	47.0
306	2018-10-14	14:45:00	54.2	46.9
307	2018-10-14	15:00:00	51.4	46.4
308	2018-10-14	15:15:00	51.3	45.9
309	2018-10-14	15:30:00	51.3	46.8
310	2018-10-14	15:45:00	51.1	46.5
311	2018-10-14	16:00:00	51.7	46.9
312	2018-10-14	16:15:00	51.7	46.7
313	2018-10-14	16:30:00	51.7	47.0
314	2018-10-14	16:45:00	52.1	46.7
315	2018-10-14	17:00:00	51.6	46.8
316	2018-10-14	17:15:00	52.0	46.3

317	2018-10-14	17:30:00	51.5	46.3
318	2018-10-14	17:45:00	52.2	46.5
319	2018-10-14	18:00:00	51.9	46.3
320	2018-10-14	18:15:00	52.5	46.8
321	2018-10-14	18:30:00	54.1	46.8
322	2018-10-14	18:45:00	57.1	46.6
323	2018-10-14	19:00:00	51.8	46.6
324	2018-10-14	19:15:00	53.0	46.8
325	2018-10-14	19:30:00	52.0	47.1
326	2018-10-14	19:45:00	51.5	46.8
327	2018-10-14	20:00:00	51.0	46.3
328	2018-10-14	20:15:00	52.4	46.3
329	2018-10-14	20:30:00	52.3	46.9
330	2018-10-14	20:45:00	52.2	46.7
331	2018-10-14	21:00:00	52.1	46.7
332	2018-10-14	21:15:00	52.1	46.3
333	2018-10-14	21:30:00	51.6	46.1
334	2018-10-14	21:45:00	51.3	45.8
335	2018-10-14	22:00:00	51.0	45.2
336	2018-10-14	22:15:00	51.6	45.9
337	2018-10-14	22:30:00	51.4	45.5
338	2018-10-14	22:45:00	51.6	44.5
339	2018-10-14	23:00:00	57.1	53.3
340	2018-10-14	23:15:00	57.9	53.8
341	2018-10-14	23:30:00	59.4	56.4
342	2018-10-14	23:45:00	55.9	52.9
343	2018-10-15	00:00:00	58.1	55.6
344	2018-10-15	00:15:00	62.1	56.1
345	2018-10-15	00:30:00	57.8	51.1
346	2018-10-15	00:45:00	54.4	49.6
347	2018-10-15	01:00:00	61.3	57.2
348	2018-10-15	01:15:00	56.2	53.8
349	2018-10-15	01:30:00	55.6	50.0
350	2018-10-15	01:45:00	52.4	45.0
351	2018-10-15	02:00:00	49.2	42.6
352	2018-10-15	02:15:00	49.1	41.7
353	2018-10-15	02:30:00	48.9	41.1
354	2018-10-15	02:45:00	47.0	40.1
355	2018-10-15	03:00:00	46.8	39.9
356	2018-10-15	03:15:00	46.8	40.2
357	2018-10-15	03:30:00	47.9	41.3
358	2018-10-15	03:45:00	47.1	40.9
359	2018-10-15	04:00:00	46.9	40.8
360	2018-10-15	04:15:00	46.4	40.4
361	2018-10-15	04:30:00	47.7	41.0
362	2018-10-15	04:45:00	47.9	41.7

363	2018-10-15	05:00:00	47.1	40.3
364	2018-10-15	05:15:00	48.2	41.6
365	2018-10-15	05:30:00	47.8	41.8
366	2018-10-15	05:45:00	47.8	41.6
367	2018-10-15	06:00:00	52.2	40.7
368	2018-10-15	06:15:00	50.3	43.6
369	2018-10-15	06:30:00	55.9	51.6
370	2018-10-15	06:45:00	54.1	48.1
371	2018-10-15	07:00:00	52.5	45.4
372	2018-10-15	07:15:00	52.5	45.2
373	2018-10-15	07:30:00	52.4	45.7
374	2018-10-15	07:45:00	51.6	45.8
375	2018-10-15	08:00:00	53.0	46.3
376	2018-10-15	08:15:00	54.9	47.1
377	2018-10-15	08:30:00	53.0	47.5
378	2018-10-15	08:45:00	55.3	47.5
379	2018-10-15	09:00:00	57.1	47.8
380	2018-10-15	09:15:00	58.4	49.0
381	2018-10-15	09:30:00	60.5	50.3
382	2018-10-15	09:45:00	57.7	48.8
383	2018-10-15	10:00:00	55.1	48.2
384	2018-10-15	10:15:00	57.0	49.8
385	2018-10-15	10:30:00	61.1	52.3
386	2018-10-15	10:45:00	59.1	50.4
387	2018-10-15	11:00:00	54.3	47.0
388	2018-10-15	11:15:00	51.2	46.5
389	2018-10-15	11:30:00	55.0	46.5
390	2018-10-15	11:45:00	59.8	48.6
391	2018-10-15	12:00:00	56.5	48.1
392	2018-10-15	12:15:00	57.5	48.9
393	2018-10-15	12:30:00	57.5	48.3
394	2018-10-15	12:45:00	59.8	48.1

9. APPENDIX B

DEFINITIONS OF ACOUSTIC TERMINOLOGY

- $L_{eq,T}$

  This is the "Equivalent Continuous" noise level. This defines the noise level that would result in the same sound energy being measured as the actual varying sound pressure level over the measurement period, T. Standardised in *ISO 1683:2008 Acoustics - Preferred reference values for acoustical and vibratory levels*.

- $L_{10,T}$

  This is the "10% Statistical" noise level. This defines the noise level which is exceeded for 10% of the measurement period, T. This index can be considered indicative of Road Traffic Noise. *Standardised in ISO 1683:2008 Acoustics - Preferred reference values for acoustical and vibratory levels*.

- $L_{90,T}$

  This is the "90% Statistical" noise level. This defines the noise level which is exceeded for 90% of the measurement period, T. This index can be considered indicative of the Background Noise. *Standardised in ISO 1683:2008 Acoustics - Preferred reference values for acoustical and vibratory levels*.

- L_{max}

  This is the highest RMS (Root Mean Square) noise level of a discrete event occurring during the survey period. *Standardised in ISO 1683:2008 Acoustics - Preferred reference values for acoustical and vibratory levels*.

- 'A'-weighting

  One of several octave band frequency weighting networks applied to a measured noise level. Considered the most commonly used frequency weighting which closely simulates the response to air pressure variations of the human ear. Defined in *BS EN 61672-1:2013 Electroacoustics. Sound level meters. Specifications*.

- 'Fast'

  One of three time constants applied by integrating sound level meters. The 'Fast' time weighting refers to an averaging time of 125 milliseconds. *Defined in BS EN 61672-1:2013 Electroacoustics. Sound level meters. Specifications*.

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