ARUP

British Land

20 Triton Street

Acoustic Report for Planning

Reference: 283266-46 R01(2)-MF

02 | 8 January 2025

Job number 283266-46

Ove Arup & Partners International Limited
8 Fitzroy Street
LondonW1T 4BJ
United Kingdom
arup.com

ARUP

Document Verification

Project title	20 Triton Street
Document title	Acoustic Report for Planning
Job number	283266-46
Document ref	283266-46 R01(2)-MF
File reference	

Revision	**Date**	**Filename**			
Issue	31th October 2024	**Description**			
			Prepared by	**Checked by**	**Approved by**
		Name	Marios Filippoupolitis PhD	David Owen CEng FIOA	David Owen CEng FIOA
		Signature			
Issue 2	8th January 2025	**Filename**			
		Description	Updated to address client comment		
			Prepared by	**Checked by**	**Approved by**
		Name	Marios Filippoupolitis PhD	David Owen CEng FIOA	David Owen CEng FIOA
		Signature			
		Filename			
		Description			
			Prepared by	**Checked by**	**Approved by**
		Name			
		Signature			

Issue Document Verification with Document ✓

Contents

Tables

Figures

Appendices

1. Introduction

Arup has been commissioned by British Land to undertake a noise assessment to accompany a planning application for the proposed installation of additional extract fans at the southwest corner of 20 Triton Street at roof level.

Building services noise emission limits have been determined in line with the London Borough of Camden (LBC) planning policy, at nearby external noise sensitive receptors, including residential properties and a hotel on Osnaburgh Street.

The following information is presented in the appendices to this report:

- Appendix A – Baseline environmental noise survey details.
- Appendix B - A glossary of acoustic terminology.

2. Policy and guidance

2.1 Local planning policy

2.1.1 Camden Council

In the Appendix 3: Noise Threshold of LBC Local Plan dated 2017 it is stated that:

"The significance of noise impact varies dependent on the different noise sources, receptors and times of operation presented for consideration within a planning application. Therefore, Camden's thresholds for noise and vibration evaluate noise impact in terms of various 'effect levels' described in the National Planning Policy Framework and Planning Practice Guidance:

• NOEL – No Observed Effect Level

• LOAEL – Lowest Observed Adverse Effect Level

• SOAEL – Significant Observed Adverse Effect Level

Three basic design criteria have been set for proposed developments, these being aimed at guiding applicants as to the degree of detailed consideration needed to be given to noise in any planning application. The design criteria outlined below are defined in the corresponding noise tables. The values will vary depending on the context, type of noise and sensitivity of the receptor:

• Green – where noise is considered to be at an acceptable level.

• Amber – where noise is observed to have an adverse effect level, but which may be considered acceptable when assessed in the context of other merits of the development.

• Red – where noise is observed to have a significant adverse effect."

It is also stated that:

"A relevant standard or guidance document should be referenced when determining values for LOAEL and SOAEL for non-anonymous noise. Where appropriate and within the scope of the document it is expected that British Standard 4142:2014 'Methods for rating and assessing industrial and commercial sound' (BS 4142) will be used. For such cases a 'Rating Level' of 10 dB below background (15dB if tonal components are present) should be considered as the design criterion)".

Existing noise sensitive receptor	*Assessment location*	*Design Period*	*LOAEL (Green)*	*LOAEL to SOAL (Amber)*	*SOAL (Red)*
*Dwellings***	*Garden used for main amenity (free field) and Outside living or dinning or bedroom window (façade)*	*Day*	*'Rating level' 10dB* below background*	*'Rating level' between 9dB below and 5dB above background*	*'Rating level' greater than 5dB above background*
*Dwellings***	*Outside bedroom window (façade)*	*Night*	*'Rating level' 10dB* below background and no events of exceeding 57dB L_{Amax}*	*'Rating level' between 9dB below and 5dB above background or noise events between 57dB and 88dB L_{Amax}*	*'Rating level' greater than 5dB above background and/or events exceeding 88 dB L_{Amax}*

Table 1 Noise levels applicable to proposed industrial and commercial developments (including plant and machinery).

**10dB should be increased to 15dB if the noise contains audible tonal elements. (day and night). However, if it can be demonstrated that there is no significant difference in the character of the residual background noise and the specific noise from the proposed development then this reduction may not be required. In addition, a frequency analysis (to include, the use of Noise Rating (NR) curves or other criteria curves) for the assessment of tonal or low frequency noise may be required.*

***levels given are for dwellings, however, levels are use specific and different levels will apply dependent on the use of the premises.*

The periods in Table 1 correspond to 0700 hours to 2300 hours for the day and 2300 hours to 0700 hours for the night. The Council will take into account the likely times of occupation for types of development and will be amended according to the times of operation of the establishment under consideration.

2.2 Assessment methodology

The assessment has been undertaken using the methodology detailed in BS 4142:2014+A1:2019 - *Methods for rating and assessing industrial and commercial sound*. This standard describes a method for rating external noise levels from factories, industrial premises, or fixed installations of an industrial nature, such as building services plant, to determine the likelihood of complaints from occupants of nearby noise sensitive receivers.

The assessment method in BS 4142 is based on the difference between the measured background noise level without the influence of any industrial noise source, and the 'rating level' of the industrial source, at the receiver location.

The 'background sound level' ($L_{A90,T}$) is the sound level existing in the absence of the 'specific sound level' at the receiver location. The 'specific sound level' ($L_{Aeq,Tr}$) from the industrial source can be subject to a certain weighting (penalty) where it displays an identifiable character (such as tonality, impulsivity, intermittency or otherwise distinctive features) to provide a 'rating level' ($L_{Ar,Tr}$). LBC has confirmed a penalty of 5 dB to be applied if the noise contains audible tonal elements.

The 'background sound level' is subtracted from the rating level and the difference used to inform the assessment of the impacts.

BS 4142 advises: *"The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs."*

3. Baseline noise conditions

An environmental baseline noise survey was carried out by Nastassia Somikava and Marios Filippoupolitis from Arup, with attended measurements taken on 10 October 2024 and unattended measurements taken between 10 and 17 October 2024, to determine the existing noise climate around 20 Triton Street. All measurements were taken under acoustically free-field conditions.

The results of the survey have been used to establish the existing background noise levels during daytime (07:00 – 23:00) and night-time (23:00 – 07:00) hours at locations considered representative of the nearest noise sensitive receptors (see Figure 1).

The details of the baseline noise survey, including the measured baseline noise levels, are presented in Appendix A.

3.1 Site description and measurement locations

The existing building is a commercial building situated in Camden. It is bounded by Triton Street to the South, Osnaburgh Street to the West and by Triton Square to the East.

Figure 1 shows the site context, including the locations of the nearest noise sensitive receptors (NSRs), and the survey locations used in the environmental baseline noise survey.

Locations A1 and A2 were selected to be representative of the noise climate near the noise sensitive receptors Meliá White House Hotel (NSR1) and the residential apartment building at 2 Osnaburgh Street (NSR2) at street level. Location U1 was on the 8th floor of 20 Triton Street, this was considered to give the most representative measurements of the noise levels at the higher floor of the nearby noise sensitive receptors NSR1 and NSR2.

Figure 1 Site context and measuring positions at the nearest noise sensitive receptors.

3.2 Measurement results

3.2.1 Attended measurements

Table 2 summarises the attended baseline noise levels measured around the site. A logarithmic average of the individual measurements during each time period is used for L_{Aeq}, and a modal average for L_{A90} which is typical of the background noise level. The range of the measured values is given inside brackets.

Location	Daytime (07:00 to 23:00 hrs) – Free field	
	$L_{A90,5min}$	$L_{Aeq,5min}$
A1	55 (54 – 56)	60 (58 – 62)
A2	54 (54 – 55)	60 (58 - 62)

Table 2 Summary of averaged sound pressures at attended measurement locations.

3.2.2 Unattended measurements

Table 3 shows the typical lowest $L_{A90,1hr}$ and $L_{A90,15min}$ for daytime and night-time respectively, at location U1 as it was determined from the time history data of Appendix A.

Typical lowest background noise level L_{A90} (dB) – Free field				
Location	**Daytime (weekdays) (07:00 – 23:00 hrs)**	**Night-time (weekdays) (23:00 – 07:00 hrs)**	**Daytime (weekends) (07:00 – 23:00 hrs)**	**Night-time (weekends) (23:00 – 07:00 hrs)**
U1	55	53	54	54

Table 3 Typical lowest L_{A90} at location U1.

4. Noise emission limits

4.1 Noise emissions limits

Daytime and night-time noise emission limits at receptors NSR1 and NSR2 have been based on the noise levels at location U1. Measurements at location U1 were in close agreement with simultaneous measurements taken at locations A1, A2.

4.2 Plant noise emissions

Table 4 and Table 5 outlines the cumulative rating noise emission limits for the proposed building services noise emissions to satisfy the planning requirements of London Borough of Camden to achieve LOAEL. The reduced limits that would apply if the noise emissions contained tonality are also included.

For noise sensitive receptors, the rating noise emissions limits have been set for the plant rating noise emissions level ($L_{A,rT}$) to be no greater than 10 dB below the typical lowest existing background noise level if the source does not contain audible tonal elements and no greater than 15 dB below the typical lowest background noise level if the source contains audible tonal elements.

Noise Sensitive Receptor	External building services noise emission limits (dBL_{Ar,T_r})			
	Daytime (7:00 to 23:00 hrs)		Night – time (23:00 – 7:00 hrs)	
	Non-tonal emissions	Tonal emissions	Non-tonal emissions	Tonal emissions
1	45	40	43	38
2	45	40	43	38

Table 4 Noise emission limits – Weekdays.

Noise Sensitive Receptor	External building services noise emission limits (dB dBL_{Ar,T_r})			
	Daytime (7:00 to 23:00 hrs)		Night – time (23:00 – 7:00 hrs)	
	Non-tonal emissions	Tonal emissions	Non-tonal emissions	Tonal emissions
1	44	39	44	39
2	44	39	44	39

Table 5 Noise emission limits – Weekends.

5. Summary

Arup has carried-out an environmental noise survey in the vicinity of 20 Triton Street. Based on the survey results, a limiting plant noise level to be achieved the nearest noise sensitive receptors to ensure compliance with the LBC LOAEL value defined in the local policy, have been identified.

A.1 Baseline environmental noise survey

An environmental baseline noise survey has been undertaken to determine the existing noise climate and character at 20 Triton Street. This appendix details the baseline noise survey and results.

The noise survey work was carried out by Nastassia Somikava and Marios Filippoupolitis from Arup with attended measurements taken on 10 October 2024 and unattended measurements taken between 10 and 17 October 2024.

A.1.1 Instrumentation

The sound level meters (SLMs), microphones and sound pressure level calibrators used by Arup are Class 1 instruments, conforming to BS EN 61672-1:2013. The SLMs were checked for correct calibration before and after each series of measurements. No significant fluctuation in level was noted throughout each survey period.

All Arup instrumentation is calibrated annually and has full traceable calibration to national and international standards, which are undertaken by an accredited calibration laboratory. Calibration certificates can be provided upon request.

All of the SLMs and other related noise monitoring instrumentation used to undertake the survey is described in Table A1.

Description	Serial number	Item type
B&K 2250	3007217	Sound level meter
B&K 4189	2920108	Microphone
B&K 4231	3014588	Calibrator
B&K ZC-0032	21701	Preamplifier
Rion NL-52	00721057	Sound level meter
Rion NH-25	22163	Preamplifier
Rion UC-59	22045	Microphone
Rion NC-75	34824366	Calibrator

Table A1 Measurement instrumentation.

A.1.2 Measurement method

At each location, the L_{Aeq}, L_{A90}, L_{A10} and L_{Amax} metric parameters were measured and recorded. All broadband measurements were A-weighted and used a fast time constant (0.125s).

At each attended measurement location, the SLM was mounted on a tripod with the microphone set between 1.2m to 1.5m above local ground level. All measurements were taken under acoustically free-field conditions. At the unattended measurement location (U1) the SLM microphone was mounted on an extension pole which was attached on a tripod on the terrace of the 8th floor of the building The appropriate windshield for the SLM was fitted to the microphone throughout to minimise wind-induced noise.

Attended measurements of 5 minutes duration were made at each location, dependent upon conditions at the measurement location. Unattended measurements of 5 minutes duration were made at each unattended measurement location. In each case, the time period was appropriate to provide a good representation of the typical noise climate at each measurement location. Attended and unattended measurements were simultaneous.

A.1.3 Weather conditions

The weather conditions were in general appropriate for carrying out the environmental noise survey. During the attended measurements the temperature was above 8 Cº, the wind speed was below 5 m/sec and there was no rain. During the period of the unattended measurements the temperature was above 4 Cº, the wind speed was below 5 m/sec (except for 12/10/2024 where the wind speed was slightly above 5 m/sec between 18:00 and 00:00) and there was no rain during most of the measurement time.

A.2 Measurement results

A.2.1 Attended measurements

A.2.1.1 Location A1

Location description:
The measurement location is located at the corner of Osnaburgh St and Longford St. It is close to the assumed residential receptor NSR 1.

Measurement period:
Thu 10/10/2024 12:41
to
Thu 10/10/2024 15:56

Weather conditions:
Wind speed: <5m/s
Wind direction: N/A
Summary: Clear and dry

Personnel:
Marios Filippoupolitis and Nastassia Somikava

Environment and observations:

At location A1, the noise climate is controlled primarily by noise emissions from plant rooms and existing louvres located at the ground level of NSR 1 and NSR2, respectively. Secondarily, the noise climate is controlled by road traffic movements on Osnaburgh Street, Longford Street, A4201 and A501.

Figure A1: Measurement location A1.

Date	Time		Sound Pressure Level, dB(A) (re 20 µPa)*				Comments
	Start [hh:mm]	Duration [hh:mm:ss]	L_{90}	L_{eq}	L_{10}	L_{max}	
10/10/2024	12:41	00:05:00	54.1	60.4	63.5	76.8	Noise from plant room at NSR1and louvre at NSR2, noise from movements on Osnaburgh St, Longford St, A4201 and A501.
10/10/2024	12:51	00:05:00	56.2	59.7	62	75.7	Osnaburgh St. Traffic count Cars: 10, Motorbikes: 1, Vans: 2
10/10/2024	12:56	00:05:00	56	61.8	63.6	81.3	
10/10/2024	13:41	00:05:00	55.2	61	63.4	76.3	
10/10/2024	13:51	00:05:00	53.5	59.7	62.3	73	
10/10/2024	13:56	00:05:00	53.9	58	61	65.5	
10/10/2024	15:36	00:05:00	53.5	59.6	62.2	77	Longford St. Traffic count Cars: 13, Motorbikes: 1, Vans: 3 Noise from airplane movement Noise from ambulance siren
10/10/2024	15:41	00:05:00	54	59	61.6	71.1	Osnaburgh St. Traffic count Cars: 5, Motorbikes: 3
10/10/2024	15:51	00:05:00	54.3	61.1	63.9	75.5	Children shouting, Loud car exhaust
Summary			**54.6**	**60.2**	**62.6**	**65.5 – 81.3**	

A.2.1.2 Location A2

Location description:
The measurement location is located on Osnaburgh St. It is close to the assumed residential receptor NSR 2.

Measurement period:
Thu 10/10/2024 13:06
to
Thu 10/10/2024 16:16

Weather conditions:
Wind speed: <5m/s
Wind direction: N/A
Summary: Clear and dry

Personnel:
Marios Filippoupolitis and Nastassia Somikava

Environment and observations:

At location A2, the noise climate is controlled primarily by noise emissions from plant rooms and existing louvres located at the ground level of NSR 1 and NSR2, respectively. Secondarily, the noise climate is controlled by road traffic movements on Osnaburgh Street, Longford Street, A4201 and A501.

Figure A2: Measurement location A2.

Date	Time		Sound Pressure Level, dB(A) (re 20 µPa)*				Comments
	Start [hh:mm]	Duration [hh:mm:ss]	L_{90}	L_{eq}	L_{10}	L_{max}	
10/10/2024	13:06	00:05:00	54.2	58.4	61.4	73.1	Noise from plant room at NSR1 and louvre at NSR2, noise from movements on Osnaburgh St, Longford St, A4201 and A501.
10/10/2024	13:16	00:05:00	54	58.8	62	70.9	
10/10/2024	13:26	00:05:00	54.2	58.3	60.8	70.4	
10/10/2024	14:06	00:05:00	54.6	60	63.5	71.3	Noise from a van
10/10/2024	14:16	00:05:00	53.9	59.4	62.5	73.1	Distant construction noise
10/10/2024	14:26	00:05:00	54.4	59.9	63.9	71.7	
10/10/2024	16:01	00:05:00	54.3	62.2	62.8	81.3	Distant construction noise Noise from a garbage truck
10/10/2024	16:11	00:05:00	54.6	60.8	64.4	79.2	
10/10/2024	16:16	00:05:00	53.8	59.7	62.5	75.9	Beeping noise from a door
Summary			**54.2**	**59.9**	**62.6**	**70.4 – 81.3**	

A.2.2 Unattended measurements

A.2.2.1 Location U1

Location description:
The measurement location is located on the eighth-floor terrace, facing Osnaburgh Street.

Measurement duration:
Thu 10/10/2024 10:41
to
Thu 10/10/2024 12:06

Logging interval:
00:05:00

Weather conditions:
Mainly dry weather for most of the measurement days

Environment and observations:

At location U1, the noise climate is controlled by noise emissions from plant rooms located at the ground level of NSR 1, by road traffic movements on Osnaburgh Street, Longford Street, A4201 and A501 and by airplane movements.

Figure A3: Measurement location U1.

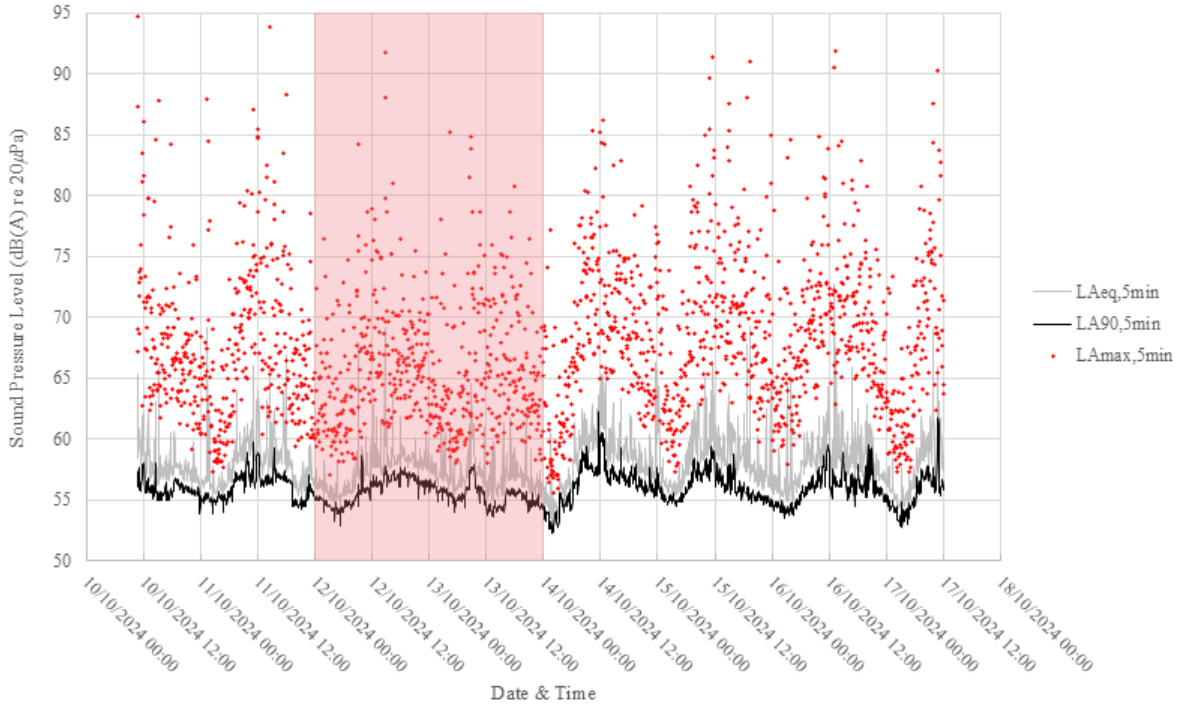

Figure A4: Time history of $L_{AEq,5min}$, $L_{A90,5min}$ and $L_{Amax,5min}$ measured during daytime (7:00 – 23:00) and night-time (23:00 – 7:00) at location U1. The shaded areas indicate the weekends.

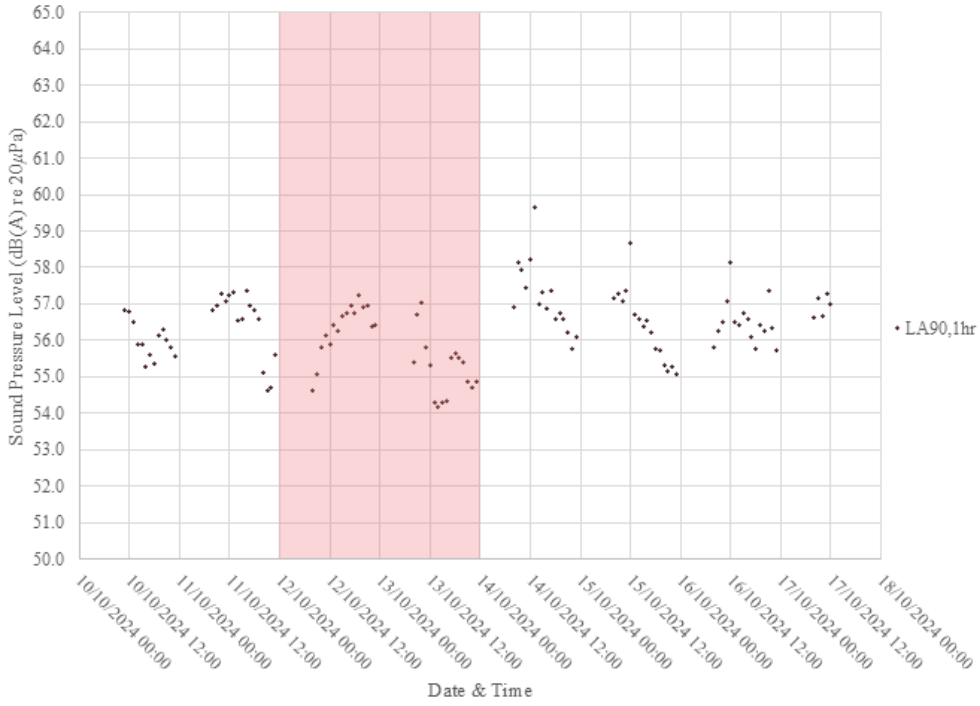

Figure A5 Time history of the background noise $L_{A90,1hr}$ measured during daytime (7:00 – 23:00) at location U1. The shaded areas indicate the weekends.

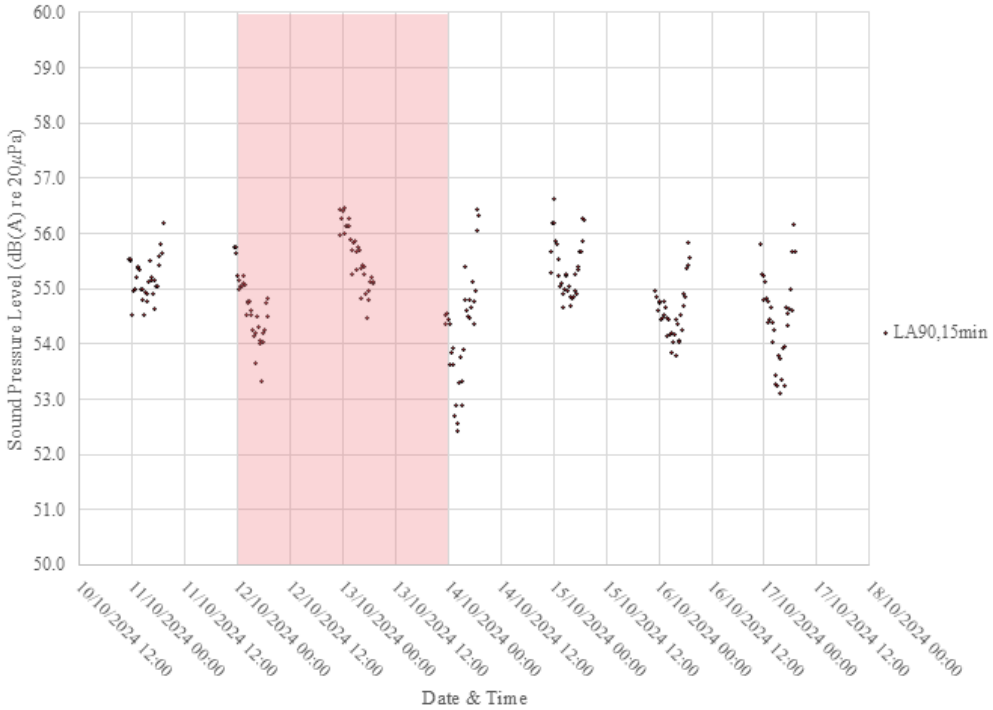

Figure A6 Time history of the background noise $L_{A90,15min}$ measured during night-time (23:00 – 7:00) at location U1. The shaded areas indicate the weekends.

Appendix B – Acoustic Terminology

Decibel (dB)

The ratio of sound pressures which we can hear is a ratio of 10^6:1 (one million: one). For convenience, therefore, a logarithmic measurement scale is used. 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.

dBA

The unit used to define a weighted sound pressure level, which correlates well with the subjective response to sound. The 'A' weighting follows the frequency response of the human ear, which is less sensitive to low and very high frequencies than it is to those in the range 500Hz to 4kHz.

In some statistical descriptors the 'A' weighting forms part of a subscript, such as L_{A10}, L_{A90}, and L_{Aeq} for the 'A' weighted equivalent continuous noise level.

Equivalent continuous sound level

An index for assessment for overall noise exposure is the equivalent continuous sound level, L_{eq}. 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.

Frequency

Frequency is the rate of repetition of a sound wave. The subjective equivalent in music is pitch. The unit of frequency is the hertz (Hz), which is identical to cycles per second. A 1000Hz is often denoted as 1kHz, e.g. 2kHz = 2000Hz. Human hearing ranges approximately from 20Hz to 20kHz. For design purposes the octave bands between 63Hz to 8kHz are generally used. The most commonly used frequency bands are octave bands, in which the mid frequency of each band is twice that of the band below it. For more detailed analysis, each octave band may be split into three one-third octave bands or in some cases, narrow frequency bands.

Sound power level

The sound power level (L_w) of a source is a measure of the total acoustic power radiated by a source. The sound power level is an intrinsic characteristic of a source (analogous to its volume or mass), which is not affected by the environment within which the source is located.

Sound pressure level

The sound power emitted by a source, results in pressure fluctuations in the air, which are heard as sound. The sound pressure level (L_p) is ten times the logarithm of the ratio of the measured sound pressure (detected by a microphone) to the reference level of 2×10^{-5}Pa (the threshold of hearing).

Thus, L_p (dB) = 10 log $(P1/P_{ref})^2$ where P_{ref}, the lowest pressure detectable by the ear, is 0.00002 pascals (i.e. $2x10^{-5}$ Pa).

The threshold of hearing is 0 dB, while the threshold of pain is approximately 120 dB. Normal speech is approximately 60 dBL_A and a change of 3 dB is only just detectable. A change of 10d B is subjectively twice, or half, as loud.

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 10% of the time period under consideration, and can be used for the assessment of road traffic noise (note that L_{Aeq} is used in BS 8233 for assessing traffic noise). The L_{90}, the level exceeded for 90% of the time, has been adopted to represent the background noise level. The L_1, the level exceeded for 1% of the time, is representative of the maximum levels recorded during

the sample period. A weighted statistical noise levels are denoted L_{A10}, dBL_{A90} etc. The reference time period (T) is normally included, e.g. $dBL_{A10, 5min}$ or $dBL_{A90, 8hr}$.