



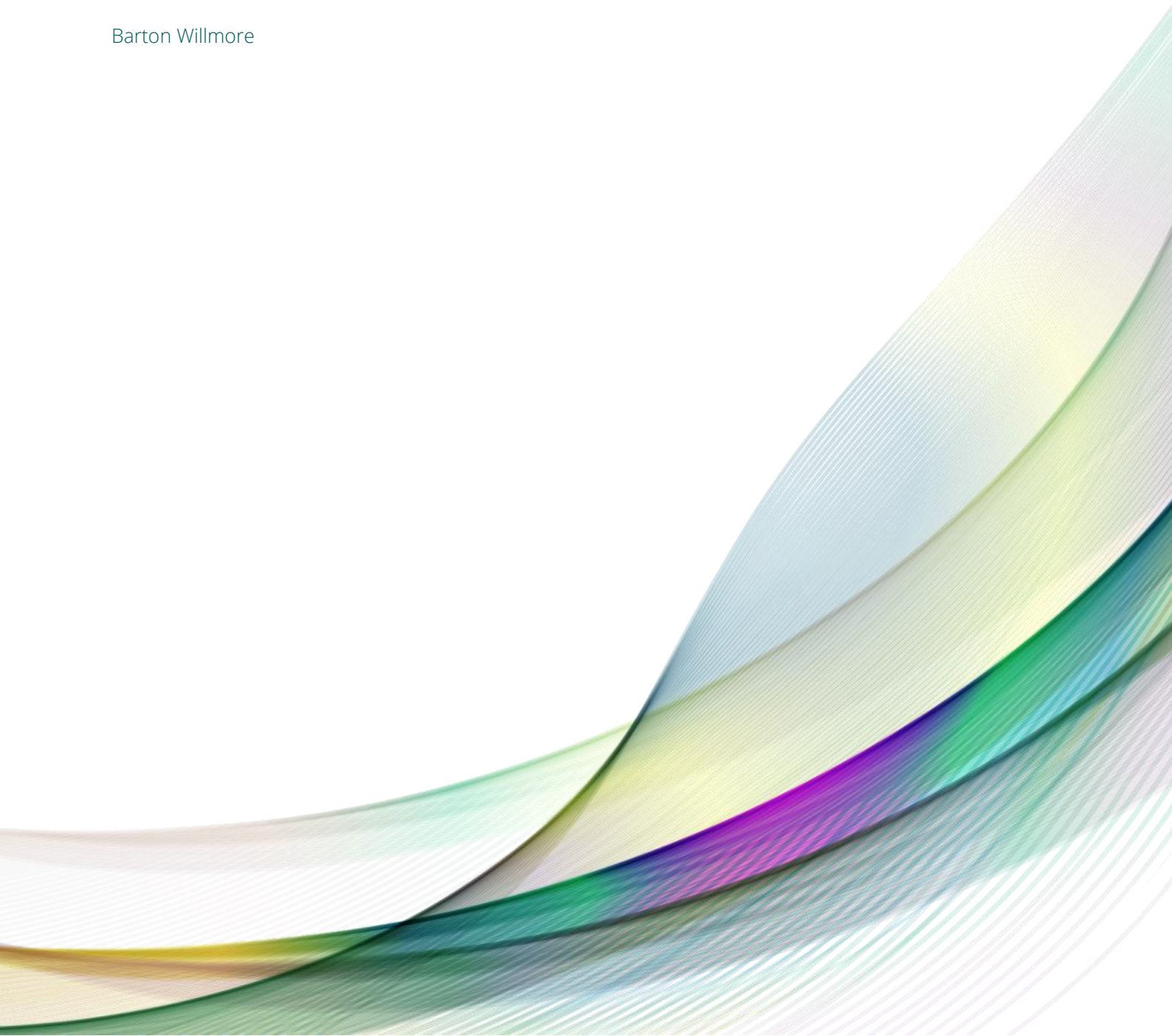
**MACH
GROUP**

Environmental Acoustics

THE GUILD, WILTON – UNIT 5

Environmental Noise Assessment

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1.0 INTRODUCTION

MACH has been appointed by Barton Willmore to undertake an environmental noise survey at the proposed site of The Guild, Wilton – Unit 5.

The development is a commercial building which includes retail units, restaurant/café spaces and various supporting ancillary spaces. Therefore, the noise survey undertaken is required to assist with the following:

- Establishing the existing noise levels across the site.
- A façade assessment to ensure internal noise levels meet any required internal noise level criteria.
- Determine appropriate background noise level to be able to set the noise limits at a later date for building services plant to protect neighbouring noise sensitive receptors.

Detail of the noise survey is presented within APPENDIX A.

1.1 Performance Standards

The table below outlines the various performance standards and guidance documents which have formed the basis of the acoustic design.

Document	Documents used for guidance
BS 4142:2014	✓
BS 7445	✓
BS8233	✓

Table 1.1: Performance Standards

1.2 Planning Conditions

MACH is not aware of any existing planning condition imposed by the local authority on the development of The Guild, Wilton – Unit 5. If any relevant planning conditional existing MACH should be notified.

2.0 ENVIRONMENTAL NOISE SURVEY

To establish the existing environmental noise levels on site, a noise survey was conducted from 11:15 on the 16/03/2022 to 12:25 on the 17/03/2022. For more information on the methodology of this survey, site information and survey data, see APPENDIX A.

2.1 Site Description

The proposed development is located at King St, Wilton, Salisbury, SP2 0BH and is situated in the centre of a shopping complex. The surrounding buildings include residential dwellings to the south and west and further commercial units are located to the north and east. The nearest noise source is seen to be road noise from North St and the A36.

2.2 Site Map

The site in relation to its surroundings and nearest noise sensitive receivers is presented in Figure 2.1.



Figure 2.1 - Proposed Development (Red) and Nearest Noise Sensitive Receivers (Blue)

2.3 Summary of $L_{Aeq,1hr}$ Noise Levels

Based on the results of the environmental noise survey as outlined within APPENDIX A of this report, the $L_{Aeq, 1hr}$ noise levels representative of the local noise climate has been produced by means of logarithmically averaging the fixed measurement data to fit this time period as shown in Table 2.1.

Location	Date	Start	End	Duration	$L_{Aeq,1hr}$ (dB)
Fixed Measurement Location 1	16/03/2022	12:00	13:00	01:00:00	57
		13:00	14:00	01:00:00	55
		14:00	15:00	01:00:00	53
		15:00	16:00	01:00:00	53 *
		16:00	17:00	01:00:00	49
		17:00	18:00	01:00:00	49
		18:00	19:00	01:00:00	49
		19:00	20:00	01:00:00	44
		20:00	21:00	01:00:00	45
		21:00	22:00	01:00:00	40
		22:00	23:00	01:00:00	40
		23:00	00:00	01:00:00	40
	17/03/2022	00:00	01:00	01:00:00	40
		01:00	02:00	01:00:00	37
		02:00	03:00	01:00:00	37
		03:00	04:00	01:00:00	38
		04:00	05:00	01:00:00	43
		05:00	06:00	01:00:00	50
		06:00	07:00	01:00:00	52
		07:00	08:00	01:00:00	49
		08:00	09:00	01:00:00	48
		09:00	10:00	01:00:00	47
		10:00	11:00	01:00:00	54
		11:00	12:00	01:00:00	48

Table 2.1: $L_{Aeq,1hr}$

* Time period included data which is deemed non-representative and has therefore been omitted from the calculation of this value.

As shown in Table 2.1, 57 dB $L_{Aeq,1hr}$ is the highest measured $L_{Aeq,1hr}$ noise level at the fixed measurement position.

2.4 Summary of Background Noise Levels, L_{A90}

The table below presents measured noise levels of the L_{A90} values measured on site. These will be discussed further in the plant noise impact assessment to ensure a representative value will be used in relation to the proposed operational hours.

Date	Location	Period, T	Average	L_{A90} (dB)
16/03/2022-17/03/2022	Fixed measurement location	Daytime (16hour)	Mode	44
		Night Time (8hour)	Mode	36

Table 2.2: Summary of Fixed Location Measurement

3.0 FAÇADE NOISE BREAK-IN ASSESSMENT

3.1 Criteria - Internal Ambient Noise Limits – BS8233:2014

The standard guidance document available for the specification on internal noise levels for non-domestic buildings is BS8233:2014. BS8233:2014 provides values in terms of $L_{Aeq,T}$, BS8233:2014 comments on the time period T, and states it should be representative of the activity involved. Therefore, for the purpose of this noise survey the $L_{Aeq,1hour}$ will be reported.

The noise limits below are provided by BS8233.

Activity	Location	Design Range $L_{Aeq,T}$ (dB)
Speech or telephone communications	Department store, Cafeteria, canteen, kitchen	50 - 55
	Concourse, Corridor, circulation space	45 - 55
Study and work requiring concentration	Staff/meeting room, training room	35 - 45

Table 3.1: BS8233 Typical Noise Levels in Non-Domestic Buildings.

Please note these noise limits apply to the development when the building is unoccupied, and therefore does not account for internal occupancy or operational noise.

3.2 Design Target

The most onerous internal ambient noise level target provided by BS8233 for this development is ≤ 45 dB $L_{Aeq,T}$.

3.3 Proposed Ventilation Strategy

The proposed ventilation strategy will contain a mixture of naturally ventilated spaces and mechanical ventilation (e.g. for kitchen spaces).

3.4 Façade Noise Levels

As shown in Table 2.1, 57 dB $L_{Aeq,1hr}$ is the highest measured $L_{Aeq,1hr}$ noise level at the fixed measurement position. This has been assessed to be representative of onerous noise levels at the façade.

3.5 Natural Ventilation Feasibility Assessment

An open window typically provides between 10 to 15 dBA of sound attenuation and has been referenced within PPG24 and other documents. MACH Acoustics typically take 13 dBA as the sound attenuation provided by an open window ventilation strategy. Subtracting this figure from the predicted façade noise level gives a predicted internal noise level.

	Highest $L_{Aeq,T}$ (dB)
Design Target	≤ 45
Highest Measured Noise Level at the Façade	57
Open window attenuation	-13
Predicted Indoor Ambient Noise Level	44

Table 3.2: Predicted Indoor Ambient Noise Level

The predicted internal noise level does not exceed the most onerous internal noise limit; therefore, the spaces can be naturally ventilated through simple openable windows.

3.6 Minimum Façade Specification

The minimum façade specification required to meet the internal noise level requirements are shown below:

- External Wall - 43dB R_w
- Window - 32dB R_w
- Roof - 43dB R_w

MACH understands the façade design may not be fully established at the time of writing this report, further development of this section may be required.

4.0 NOISE BREAK-OUT ASSESSMENT

4.1 Criteria

BS 4142:2014 “Methods for rating and assessing industrial and commercial sound” describes a method of determining the level of noise of an industrial nature, together with the procedures for assessing whether the noise in question is likely to give rise to complaints from persons living in the vicinity. As such, an assessment to BS 4142 is typically called for within planning conditions.

The likelihood of complaints in response to a noise depends on various factors. BS 4142 assesses the likelihood of complaints by considering the margin by which the noise in question exceeds the background noise level.

4.2 Design Target

It is currently unknown whether the local authority has specific plant noise limits; therefore, the plant noise rating level limits at the nearest noise sensitive receptor are suggested to be equal to or below the background level for day and night to reduce the risk of adverse impact. This is subject to agreement with the local authority.

This will be assessed against the existing background noise levels, L_{A90} . For the purposes of assessment, MACH Acoustics has used the modal daytime and night-time background noise level based on the L_{A90} histogram data in APPENDIX B.

Position	Time Period	Assessed Background Noise Level (dB L_{A90})	Plant Noise Rating Level Limit dB $L_{A,T,r}$ At Nearest Residential Receiver
Fixed	Daytime (07:00 - 23:00)	44	44
	Night-Time (23:00 - 07:00)	36	36

Table 4.1: L_{A90} Background Noise Levels for Plant Noise Break-out Assessment

5.0 PLANT ASSESMENT

Details regarding the installation of mechanical plant have not yet been provided to MACH. This section will be developed when further information is available.

APPENDIX A ENVIRONMENTAL NOISE SURVEY

To establish the existing environmental noise levels on site, a noise survey was conducted between 11:15 on the 16/03/2022 and 12:25 on the 17/03/2022.

This site assessment was undertaken by Jason Bradshaw of MACH Group.

A.1 Site Description

The site is located at King St, Wilton, Salisbury, SP2 0BH and is situated in the centre of a developing shopping complex. The site is flanked by two rivers and is near to the A36. Across from the site there is a row of residential housing over the river.

A.1.1 Subjective Noise Climate (On-site)

Noise Type	Noise Characteristics	Sources
Dominant	A primary contributor of noise levels on the site.	Road noise Pedestrians
Other Noise Contributions	Contributors to the remainder of the noise climate on site.	Rivers running through the site Birdsong

Table A.1.1 - Subjective Summary of the Noise Sources

A.1.2 Non-Representative Noise Sources

During the survey, no noise events occurred which would be deemed as atypical of the site location.

A.2 All Measurement Locations

To help with the understanding of the site and measurement locations all the measurement positions are presented on the map below. Photos of the locations in situ are in the following sections.



Figure A.2 - All Measurement Locations on a Map

A.3 Fixed Measurement

A fixed microphone position was used to record noise levels between 11:15 on the 16/03/2022 and 12:25 on the 17/03/2022, where the fixed long-term meter was set to measure consecutive 'A' weighted 5-minute time samples. Measurements have been taken in free field conditions.

To help with the understanding of the site and the measurement locations, the figures below present the location of the microphone position(s) in situ. The results of the environmental noise survey are provided within section A.3.2.

A.3.1 Fixed measurement Location – F1



Figure Error! Reference source not found. - Fixed Measurement location in situ

A.3.2 Fixed Measurement Results

The following graph presents the noise levels recorded over the measurement period at the fixed location (F1).

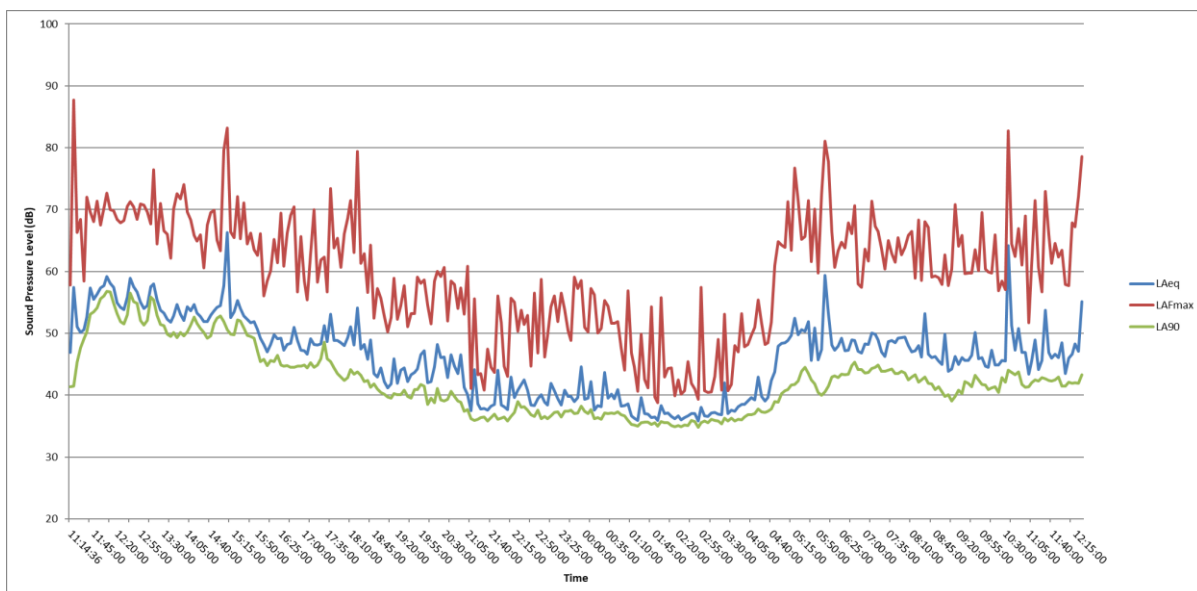


Figure A.3.2 - Sound Pressure Level at fixed location, F1

A.4 Spot Measurement

Spot measurements help quantify existing noise levels at different points around the site.

The figures below present the location of the microphone position(s) in situ.

The results of the measured levels at these location(s) are also presented in section A.5 Table A.5.

A.4.1 Spot Measurement - S1

This spot measurement was taken between 11:40 and 11:55 on 17/03/2022 in free field conditions.



Figure A.4.1 - Spot Measurement S1 in situ

A.4.2 Spot Measurement – S2

This spot measurement was taken between 12:00 and 12:15 on 17/03/2022 in free field conditions.



Figure A.4.2 - Spot Measurement S2 in situ

A.5 All Spot Measurement Results

The LAeq, LAFmax, and LA90 levels measured from all spot measurements are shown in Table 4.2 below.

Spot	Start	End	Duration	LAeq, T (dB)	LAFmax	LA90
S1	11:40	11:55	15 mins	71.2	94	57.4
S2	12:00	12:15	15 mins	60.2	79.6	45.6

Table A.5 - Spot Measurement 1 Results Table

A.6 Measurement Equipment

Item	Serial No.	Last Calibration	Certificate No.	Calibration Due
NTI Precision Sound Analyser XL2 TA	A2A-18713-E0	Mar-21	UK-21-018	Mar-23
NTI Pre-amplifier MA220	9517	Mar-21	UK-21-018	Mar-23
NTI Microphone Capsule MC230A	A19763	Mar-21	UK-21-018	Mar-23
NTI Precision Sound Analyser XL2 TA	A2A-13174-E0	Sep-21	UK-21-073	Sep-23
NTI Pre-amplifier MA220	8073	Sep-21	UK-21-073	Sep-23
NTI Microphone Capsule MC230A	A14429	Sep-21	UK-21-073	Sep-23
Svante Acoustic Calibrator SV31	32527	Dec-21	167864	Dec-22

Table A.6 – Measurement Equipment

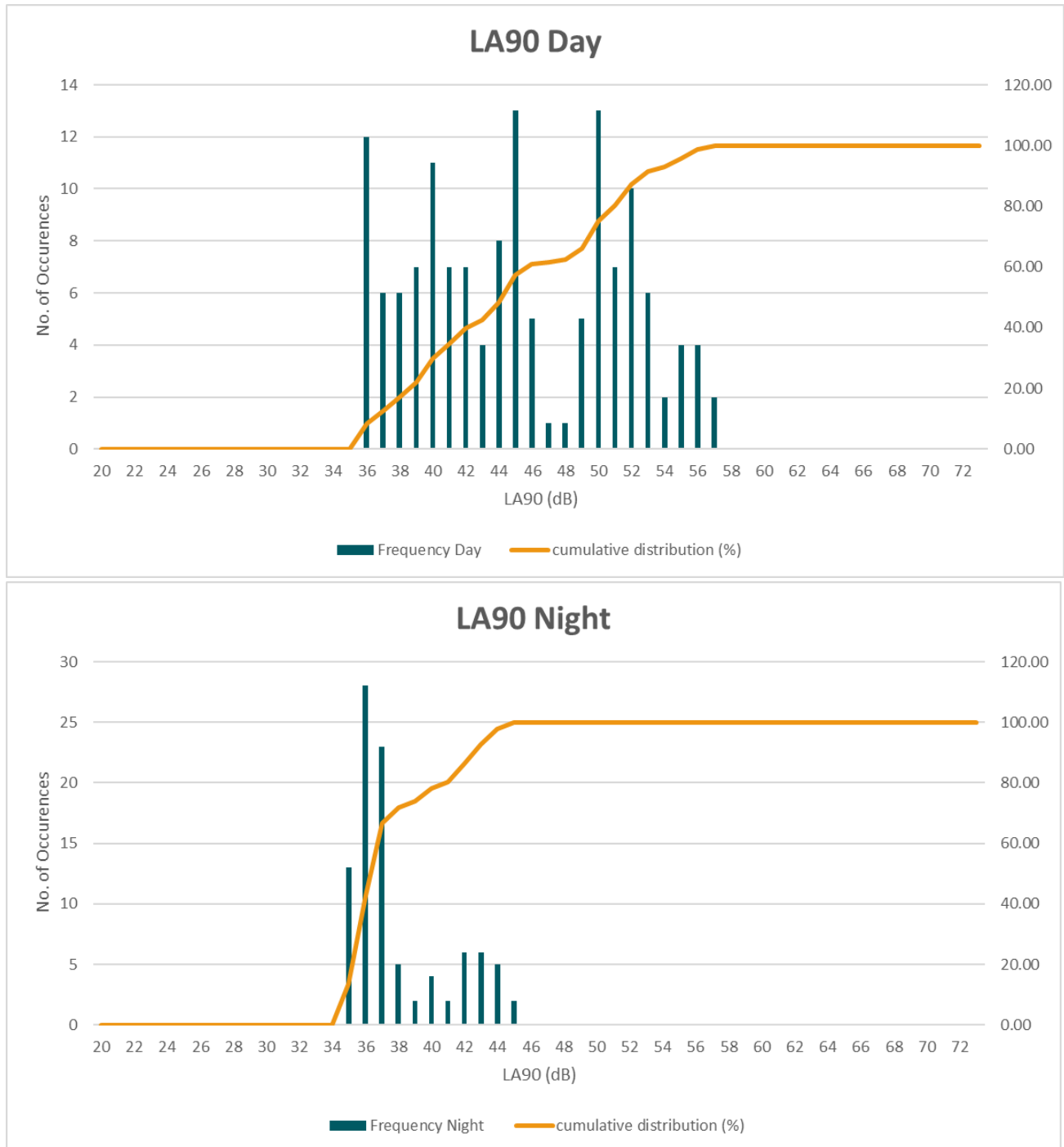
A.7 Meteorological Conditions

Data Taken from: <https://www.timeanddate.com/weather/>

Date	Time (hh:mm)	Temperature (High / Low) (°C)	Humidity (%)	Pressure (hPa)	Wind Speed (m/s)	Wind Direction	Conditions
16/03/2022	06:00	10/8	94	1018	2.2	E	Drizzle. Partly sunny
	12:00	10/8	96	1016	3.6	NW	Drizzle Broken clouds
	18:00	7/4	87	1021	4.4	NW	Passing clouds
17/03/2022	00:00	4/1	85	1026	2.8	WSW	Clear
	06:00	11/1	78	1030	2.8	WSW	Scattered clouds
	12:00	13/11	56	1032	4.4	WSW	Passing clouds

Table A.7 - Meteorological Conditions

APPENDIX B LA90 HISTOGRAM



APPENDIX C LEGISLATION FOR NOISE

C.1 National Planning Policy Framework (NPPF)

In March 2014 the Government published the National Planning Policy Framework (NPPF) for noise which sets out the Government's planning policies for England and how these are expected to be applied.

The NPPF provides a framework within which local people and their council can produce their own distinctive local and neighbourhood plans, which reflect the needs and priorities of their communities.

With regards to noise the Framework states that 'Plan-making and decision making need to take account of the acoustic environment and in doing so consider:

- whether or not a significant adverse effect is occurring or likely to occur;
- whether or not an adverse effect is occurring or likely to occur; and
- whether or not a good standard of amenity can be achieved."

It also states that:

"The subjective nature of noise means that there is not a simple relationship between noise levels and the impact on those affected. This will depend on how various factors combine in any particular situation."

C.2 Noise Policy Statement for England (NPSE)

The aim of the Noise Policy Statement for England (NPSE) is to provide clarity regarding current policies and practices to enable noise management decisions to be made within the wider context, at the most appropriate level, in a cost-effective manner and in a timely fashion. The NPSE applies to all forms of noise including environmental noise, neighbour noise and neighbourhood 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

C.3 National Planning Policy Guidance - Noise

Guidance on the interpretation of the policy aims contained within the NPPF is contained within National Planning Policy Guidance (NPPG). The NPPG introduces the concept of a noise exposure hierarchy based on likely average response. The current guidance contained in the NPPG is summarised in the table below. This advice has not changed since the introduction of the 2018 version of the NPPF.

Perception	Examples of Outcomes	Increasing Effect Level	Action
Not noticeable	No Effect	No Observed Effect	No specific measures required
Noticeable and not intrusive	Noise can be heard but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Noticeable and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

Table 5.1: Noise exposure hierarchy

APPENDIX D BS 4142

BS 4142:2014 “Methods for rating and assessing industrial and commercial sound” describes a method of determining the level of noise of an industrial nature, together with the procedures for assessing whether the noise in question is likely to give rise to complaints from persons living in the vicinity. As such, an assessment to BS 4142 is typically called for within planning conditions. The likelihood of complaints in response to a noise depends on various factors. BS 4142 assesses the likelihood of complaints by considering the margin by which the noise in question exceeds the background noise level.

BS 4142 states that one should ‘obtain an initial estimate of the impact of the specific sound by subtracting the measured background sound level from the rating level and consider the following:

- a) Typically, the greater this difference, the greater the magnitude of the impact.
- b) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- c) A difference of around + 5 dB is likely to be an indication of an adverse impact, depending on the context.
- d) The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

The aforementioned rating level is based upon the specific noise level of the noise source in question. A correction should be applied to the specific noise level to obtain an increased rating level if ‘a tone, impulse or other characteristic occurs, or is expected to be present, for new or modified sound sources. To summarise, BS4142 section 9.2 advises the following with regards to corrections for acoustic characteristics:

- **Tonality** – for sound ranging from not tonal to prominently tonal the Joint Nordic Method gives a correction of between 0 dB and +6 dB for tonality. Subjectively, this can be converted to a penalty of 2 dB for a tone which is just perceptible at the noise receptor, 4 dB where it is clearly perceptible, and 6 dB where it is highly perceptible.
- **Impulsivity** – A correction of up to +9 dB can be applied for sound that is highly impulsive, considering both the rapidity of the change in sound level and the overall change in sound level. Subjectively, this can be converted to a penalty of 3 dB for impulsivity which is just perceptible at the noise receptor, 6 dB where it is clearly perceptible, and 9 dB where it is highly perceptible.
- **Other sound characteristics** – Where the specific sound features characteristics that are neither tonal nor impulsive, though otherwise are readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied
- **Intermittency** – When the specific sound has identifiable on/off conditions, if the intermittency is readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied.