



**Independent Acoustic
Consultancy Practice**

Environmental Noise Assessment

**The Long House
Newport**

6255/ENS1

Environmental Noise Assessment

Project:	The Long House
Site Address:	Blacksmiths Way Coedkernew Newport NP10 8TR
HA Reference:	6255/ENS1
Date:	14/09/2021
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1. INTRODUCTION

We understand that 2no dwellings are proposed at The Long House, Blacksmiths Way, Coedkernew, Newport, NP10 8TR.

The Local Planning Authority have requested a noise assessment is carried out prior to the development of the land.

This report has therefore been commissioned to assess existing ambient and background noise levels impinging on the site from local sources.

Survey results have been used for comparison with typical Local Authority Planning conditions and current planning guidance.

2. CRITERIA

2.1 Planning Policy Wales

The Welsh Government's Planning Policy Wales (Edition 11) dated February 2021, states the following;

"6.7.20 Where sensitive developments need to be located close to existing transportation infrastructure for sustainable movement and access they should be designed, as far as practicable, to limit harmful substances and noise levels within and around those developments both now and in the future. This may include employing the principles of good acoustic design and the inclusion of active travel or travel management measures as part of development proposals. Such development, however, should preferably be located away from existing sources of significant noise, which may include aircraft noise or roads, particularly new roads or those with programmed route improvements."

The document states *"For more information on the principles of good acoustic design, readers are referred to Professional Planning Guidance (ProPG) Supplementary Document 2, produced by the Association of Noise Consultants, the Institute of Acoustics and the Chartered Institute of Environmental Health (<http://www.association-of-noise-consultants.co.uk/propg/>). ProPG has been written principally to assist with the planning process in England, but the design principles put forward in Supplementary Document 2 may also be adopted in Wales.*

2.2 ProPG Supplementary Document 2

Professional Practice Guidance on Planning & Noise, New Residential Development 'Supplementary Document 2 – Good Acoustic Design' produced by the ANC, IOA and CIEH discusses the general principles of Good Acoustic Design, including the following hierarchy of noise management measures in descending order of preference;

- i) Maximising the spatial separation of noise source(s) and receptor(s).*
- ii) Investigating the necessity and feasibility of reducing existing noise levels and relocating existing noise sources.*
- iii) Using existing topography and existing structures (that are likely to last the expected life of the noise-sensitive scheme) to screen the proposed development site from significant sources of noise.*
- iv) Incorporating noise barriers as part of the scheme to screen the proposed development site from significant sources of noise.*
- v) Using the layout of the scheme to reduce noise propagation across the site.*
- vi) Using the orientation of the buildings to reduce the noise exposure of noise-sensitive rooms.*
- vii) Using the building envelope to mitigate noise to acceptable levels.*

“It should be remembered that good acoustic design is a process that begins as soon as land is under consideration for development. The timeline for good acoustic design stretches from the conceptual design stage, through quality control during construction, and beyond to post construction performance testing.

Both internal and external spaces should be considered in the acoustic design process. Care should be taken to ensure that acoustic mitigation measures do not result in an otherwise unsatisfactory development. Good acoustic design must be regarded as an integrated part of the overall design process”.

2.3 Technical Advice Note (Wales) 11

Noise bands defining categories A-D of TAN 11 are set in terms of $L_{Aeq,16hr}$ daytime and $L_{Aeq,8hr}$ night time levels for road traffic noise and mixed sources, free field 1.2-1.5m above ground level as follows;

Table 2.1 – TAN11 Noise Exposure Categories

Recommended noise exposure categories for new dwellings near existing noise sources (ref Table 2 of TAN 11 (Wales) October 1997)					
Noise Source	Time	Noise Exposure Categories			
		A	B	C	D
Road Traffic	07:00-23:00	<55	55-63	63-72	>72
	23:00-07:00	<45	45-57	57-66	>66
Rail Traffic	07:00-23:00	<55	55-66	66-74	>74
	23:00-07:00	<45	45-59	59-66	>66
Air Traffic	07:00-23:00	<57	57-66	66-72	>72
	23:00-07:00	<48	48-57	57-66	>66
Mixed Sources ⁽⁴⁾	07:00-23:00	<55	55-63	63-72	>72
	23:00-07:00	<45	45-57	57-66	>66

Note: In addition, sites where individual noise events regularly exceed 82dB(A) $L_{max}(slow)$, several times in any night time hour should be treated as being in NEC C, unless the $L_{eq}(8 \text{ hour})$ already puts the site in NEC D.

(4) Mixed sources: this refers to any combination of road, rail, air and industrial noise sources. The "mixed source" values are based on the lowest numerical values of the single source limits in the table. The "mixed source" NECs should only be used where no individual noise source is dominant.

2.4 British Standard 8233:2014

British Standard 8233:2014 'Guidance on sound insulation and noise reduction for buildings' includes internal noise criteria of habitable rooms in residential dwellings, as shown below;

Table 2.2 – BS 8233:2014 Internal Ambient Noise Criteria for Habitable Rooms

Location	Desired		Reasonable *	
	07:00 to 23:00	23:00 to 07:00	07:00 to 23:00	23:00 to 07:00
Living room	35 dB $L_{Aeq,16hr}$	-	40 dB $L_{Aeq,16hr}$	-
Dining room/area	40 dB $L_{Aeq,16hr}$	-	45 dB $L_{Aeq,16hr}$	-
Bedroom	35 dB $L_{Aeq,16hr}$	30 dB $L_{Aeq,8hr}$	40 dB $L_{Aeq,16hr}$	35 dB $L_{Aeq,8hr}$

* NOTE 7 states “Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5dB and reasonable internal conditions still achieved.

In addition BS 8233:2014 states: “Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or $L_{Amax,F}$, depending on the character and number of events per night. Sporadic noise events could require separate values.”

Reference is therefore made to World Health Organisation (WHO) ‘Guidelines for Community Noise, 1999’ which states “For a good sleep, it is believed that indoor sound pressure levels should not exceed approximately 45dB L_{Amax} more than 10-15 times per night (Vallet & Vernet 1991)”.

Section 7.7.3.2 of BS 8233:2014 entitled ‘Design criteria for external noise’ states;

“For traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$ with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments. However, it is also recognised that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs to be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited.”

The above criteria in BS 8233:2014 apply for sources without specific character, previously termed “anonymous noise”. BS 8233:2014 7.7.1 advises:

“NOTE: Noise has a specific character if it contains features such as a distinguishable, discrete and continuous tone, is irregular enough to attract attention, or has strong low-frequency content, in which case lower noise limits might be appropriate.”

2.5 Planning Conditions

The local planning authority have provided the following statements to the Pre App submission;

“The Council's Environmental Health Officer requires that a noise assessment is submitted with an application (also applicable to an Outline application). This is due to the proximity to existing noise sources (i.e. road traffic noise). If a noise assessment indicates that road traffic noise would impact residents then a detailed scheme of noise mitigation measures would be required. For reference of the required noise levels internally and externally I have set out our standard noise traffic conditions

Road Traffic Noise – Internal

No development, other than demolition, shall commence until a scheme has been submitted to and approved in writing by the Local Planning Authority to provide that all habitable rooms exposed to external road traffic noise in excess of 55 dBA Leq 16 hour [free field] during the day [07.00 to 23.00 hours] or 45 dBA Leq 8 hour [free field] at night [23.00 to 07.00 hours] shall be subject to sound insulation measures to ensure that all such rooms achieve an internal noise level of 35 dBA Leq 16 hour during the day and 30 dBA Leq 8 hour at night. The submitted scheme shall ensure that habitable rooms subject to sound insulation measures shall be able to be effectively ventilated without opening windows. No dwelling shall be occupied until the approved sound insulation and ventilation measures have been installed to that property in accordance with the approved details. The approved measures shall be retained thereafter in perpetuity.

Reason: To ensure that the amenities of future occupiers are protected.

Road Traffic Noise – External

No development, other than demolition, shall commence until a scheme has been submitted to and approved in writing by the Local Planning Authority to provide that the maximum day time noise level in outdoor living areas exposed to external road traffic noise shall not exceed 50 dBA Leq 16 hour [free field]. The scheme of noise mitigation as approved shall be constructed in its entirety prior to the first occupation of any dwelling and shall be retained thereafter in perpetuity.

Reason: To ensure that the amenities of future occupiers are protected.

The Council's Environmental Officer would also require a Construction Environmental Management Plan to be secured via a condition should an application be granted.”

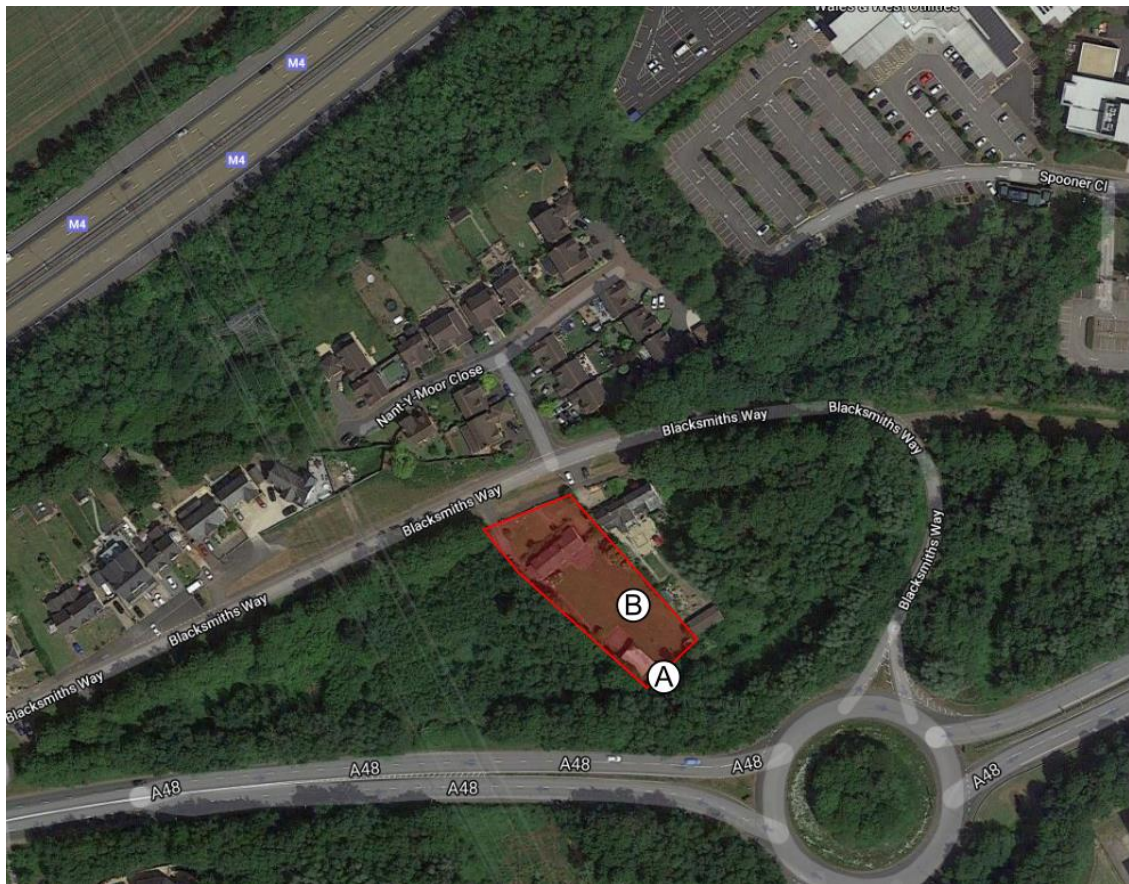
3. ENVIRONMENTAL NOISE SURVEY

3.1 Procedures

Continuous noise monitoring was carried out from 1100hrs on Thursday, 19 August 2021 to 1100hrs on Friday, 20 August 2021 at positions A and B.

Data including L_{Amax} , L_{Aeq} and background L_{A90} was logged at 1 minute & 15 minute intervals over the monitoring period, along with continuous audio and 100ms data to allow source identification and further detailed analysis of results if required.

Figure 3.1 – Site Plan Showing Monitoring Locations



Site plan in Figure 3.1 above shows the development site and continuous monitoring positions used, namely:

Table 3.1 – Continuous Monitoring Location Details

Position	Description
A	Located on southern tree line approximately 30m from the A48
B	Located central of the garden approximately 50m from the A48 to the south and approximately 200m from the M4 to the north. Location chose as existing property and half of the garden is to be retained with the development area to be towards the south of the property

Note: All microphone positions approximately 1.5m above local ground level.

3.2 Meteorological Conditions

Approximate weather conditions are shown in time history graphs in Figure B.1 and Figure B.2 of Appendix B.

To summarise, the weather conditions during the monitoring period were dry with an occasional breeze.

3.3 Measurement Equipment

The following measurement equipment was used during the surveys:

Table 3.2 – Noise Monitoring Equipment List

Make	Description	Model	Serial Number	Last Calibrated	Certificate No.
NTi	Type 1 - Sound Level Meter	XL2-TA	A2A-08723-E0	30 October 2019	FL-19-235
	Preamplifier	MA220	1820	30 October 2019	FL-19-235
	Microphone	Capsule	9381	30 October 2019	FL-19-235
Rion	Type 1 - Sound Level Meter	NL-32	1103396	03 June 2021	UCRT19/1270
	Preamplifier	NH-21	34335	03 June 2021	UCRT19/1270
	Microphone	UC-53A	317921	03 June 2021	UCRT19/1270
Rion	Calibrator (94.03dB @ 984Hz)	NC-73	10355197	01 June 2021	UCRT20/1265

Measurement systems were calibrated before and after the surveys and no variation occurred.

Note: Copies of traceable calibration certificates for all equipment are available upon request.

3.4 Results

Time history graphs in Figure B.3 & Figure B.4 of Appendix B show L_{Amax} , L_{Aeq} and L_{A90} sound pressure levels measured at positions A & B respectively.

The following $L_{Aeq,16hr}$ daytime (0700-2300hrs) and $L_{Aeq,8hr}$ night-time (2300-0700hrs) noise levels were measured;

Table 3.3 – Summary of Daytime $L_{Aeq,16hr}$ and Night-time $L_{Aeq,8hr}$ Results

Period	Date	Position	
		A	B
Daytime $L_{Aeq,16hr}$ (dB)	19-20/08/2021	55.5	54.8
Night-time $L_{Aeq,8hr}$ (dB)	19-20/08/2021	50.1	49.6

There were no $L_{Amax,F}$ events over 82dB measured during the night-time period (2300-0700hrs) at any of the monitoring locations.

Daytime period is therefore assessed as critical (>5dB difference between daytime and night-time).

It is indicated that the site falls between NEC A and the lower end of NEC B of TAN11 daytime and under NEC B of TAN11 during the night time period.

Graphs in Figure B.5 & Figure B.6 of Appendix B show statistical analysis of background sound levels measured at positions A & B respectively.

The following minimum consistent daytime and night-time background L_{A90} sound levels have been determined;

Table 3.4 – Minimum Consistent Daytime and Night-time Background L_{A90} Results

Period	Position	
	A	B
Daytime (0700-2300hrs) L_{A90} (dB)	51	51
Night-time (2300-0700hrs) L_{A90} (dB)	37	43

Road traffic noise from the A48 and M4 controlled the ambient and background climate daytime and night-time.

4. DISCUSSION

Road traffic noise levels are indicated to fall above 'trigger' levels for sound insulation measures quoted in the Local Authority's standard planning condition, and above the criterion for external spaces.

At this stage a housing layout does not currently exist. A detailed assessment of noise levels and required mitigation measures should be carried out at detailed design stage by a suitably qualified acoustic consultant. However, the following sections discuss the likely noise mitigation measures which may need to be considered for the site to control noise levels to internal and external spaces.

4.1 Internal Noise Levels

ProPG stage 2 guidance advises: "*internal noise levels can be assessed with windows closed, however any façade openings used to provide whole dwelling ventilation (e.g. trickle ventilators) should be assessed in the "open" position and, in this scenario*". The majority of the site should be capable of meeting the 35dB $L_{Aeq,16hr}$ & 30dB $L_{Aeq,8hr}$ internal noise criteria quoted BS8233 and ProPG guidance with standard trickle ventilators in open position and windows closed. Noise mitigation measures can be readily accommodated and it is therefore not considered to be a significant constraint to developing the site. At these locations good acoustic design principles are to be followed to minimise the potential noise impacts. These are likely to include:

- additional sound insulation measures, typically in the form of uprated acoustic glazing and mechanical ventilation, to control road noise and regular night-time $L_{Amax,F}$ levels intrusion to within BS8233 / ProPG guideline criteria.

Measured on site noise levels indicate that standard thermal double glazing and trickle vents is likely to be adequate to control noise intrusion in line with the internal noise requirements of the planning condition. This should be confirmed at a later date once final housing layouts are provided.

4.2 External Noise Levels - Gardens

Noise mitigation measures recommended under ProPG in Section 2.2 should be given consideration.

It is understood the existing garden area (at Pos B) is to be retained for the garden areas of the dwellings. The dwellings themselves located to the south and are likely to provide screening to the A48 along with any proposed garden fencing, which should reduce road traffic noise levels from the A48 in these gardens.

However, residual noise levels from the M4 may keep overall noise above the 50dB(A) value quoted in the planning conditions. Noise levels should fall below the 55dB(A) desirable limit quoted in BS8233:2014

5. CONCLUSION

An environmental noise assessment has been carried out for the proposed residential development at The Long House, Blacksmiths Way, Coedkernew, Newport, NP10 8TR.

Road traffic is indicated to control the ambient noise climate day and night.

A noise survey has been carried out across the site to confirm daytime and night time noise levels across the site.

The noise survey indicates that daytime is the critical period (day/night difference > 5dB).

It is indicated that the site falls between NEC A and the lower end of NEC B of TAN11 daytime and under NEC B of TAN11 during the night time period, exceeding trigger levels quoted in Newport's standard planning conditions.

Therefore noise should be taken into consideration when specifying external building fabric elements and assessing noise mitigation to gardens. Preliminary advice regarding internal and external noise levels has been included. A detailed assessment of noise levels and required mitigation measures should be carried out at detailed design stage by a suitably qualified acoustic consultant.

APPENDIX A - ACOUSTIC TERMINOLOGY

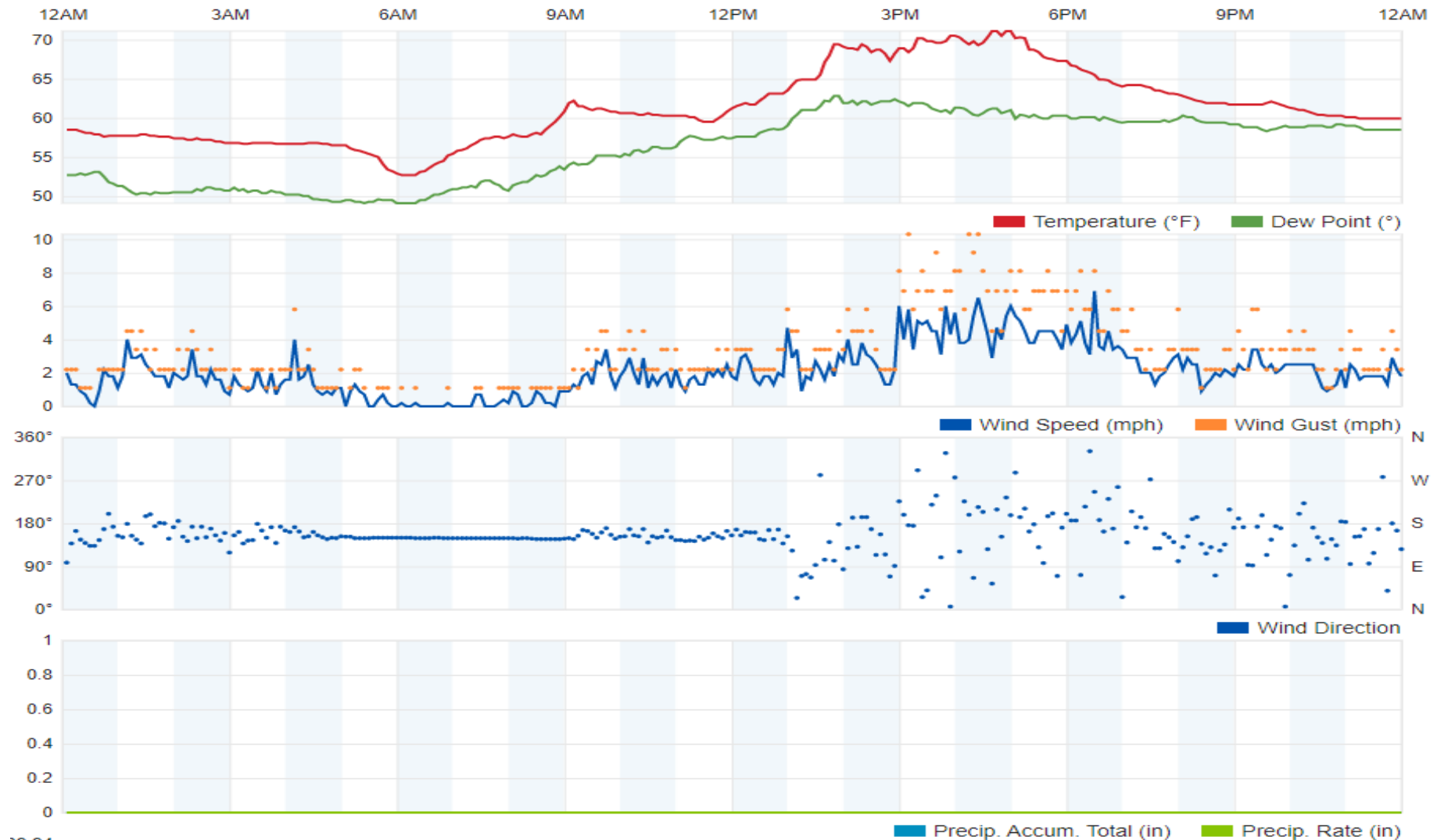
Human response to noise depends on a number of factors including loudness, frequency content and variations in level with time. Various frequency weightings and statistical indices have been developed in order to objectively quantify 'annoyance'.

The following units have been used in this report:

dB(A)	The sound pressure level A-weighted to correspond with the frequency response of the human ear and therefore a persons' subjective response to frequency content.
L_{eq}	The equivalent continuous sound level is a notional steady state level which over a quoted time period would have the same acoustic energy content as the actual fluctuating noise measured over that period.
L_{max}	The highest instantaneous sound level recorded during the measurement period.
L_{10}	The sound level which is exceeded for 10% of the measurement period. i.e. The level exceeded for 6 minutes of a 1 hour measurement - used as a measure of background noise.
L_{90}	The sound level which is exceeded for 90% of the measurement period. i.e. The level exceeded for 54 minutes of a 1 hour measurement - used as a measure of background noise.
$L_{Ar,Tr}$	The 'rating' level, as described in BS 4142:2014 – the specific noise plus any adjustment for the characteristic features of the noise.
SSR	Sound sensitive receiver
SEL	'Sound Exposure Level', The dB(A) level which, if it lasted 1 second, would produce the same sound energy as the event in question (e.g. a train pass-by).

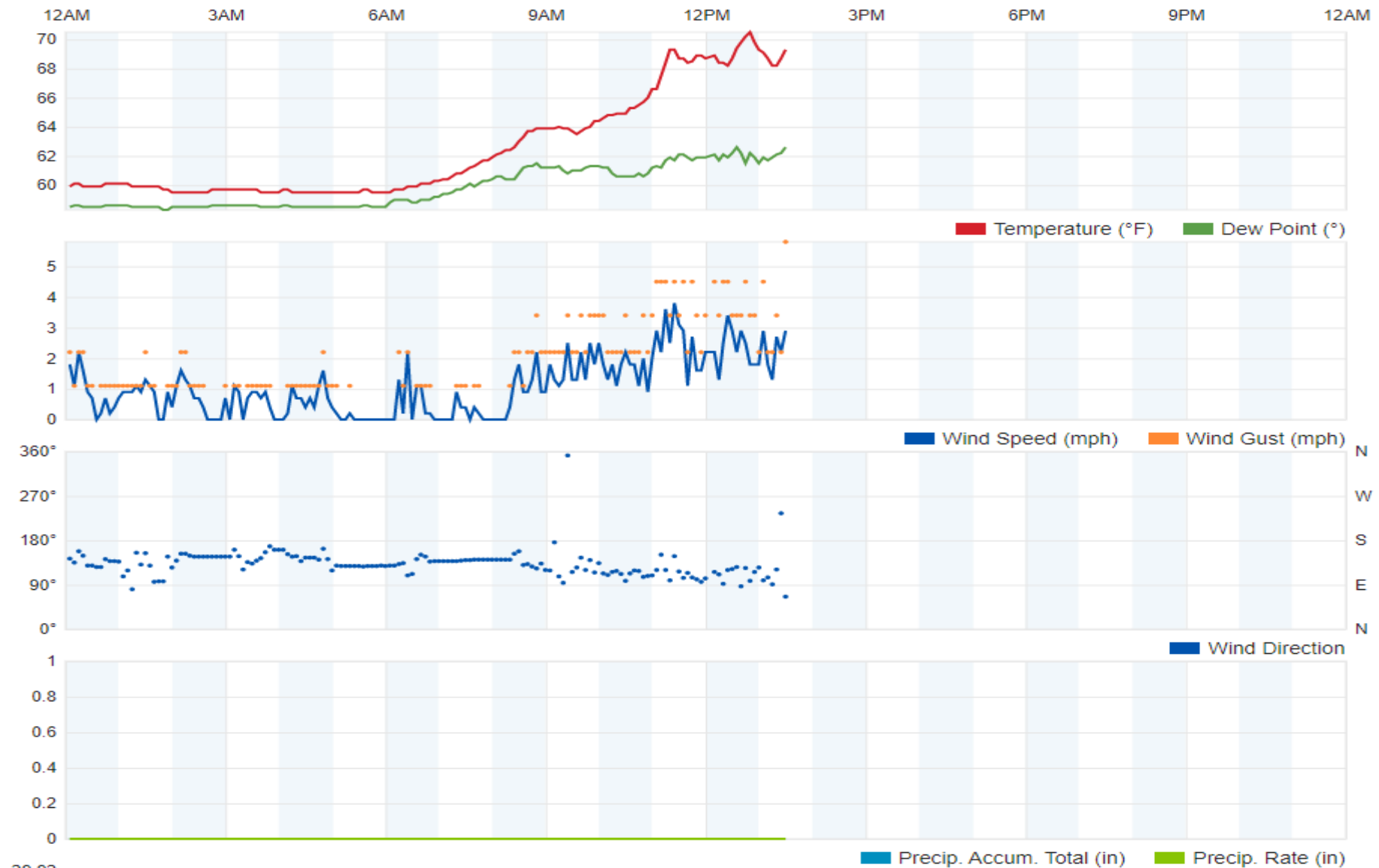
APPENDIX B - DIAGRAMS, GRAPHS AND TABLES

Figure B.1 – Approximate Weather History for Thursday, 19 August 2021



Note: Taken from www.wunderground.com - weather station INEWPO50 located in Newport [Elev 30 ft, 51.55 °N, 3.03 °W]

Figure B.2 – Approximate Weather History for Friday, 20 August 2021



Note: Taken from www.wunderground.com - weather station INEWPO50 located in Newport [Elev 30 ft, 51.55 °N, 3.03 °W]

Figure B.3 – Time History at Position A

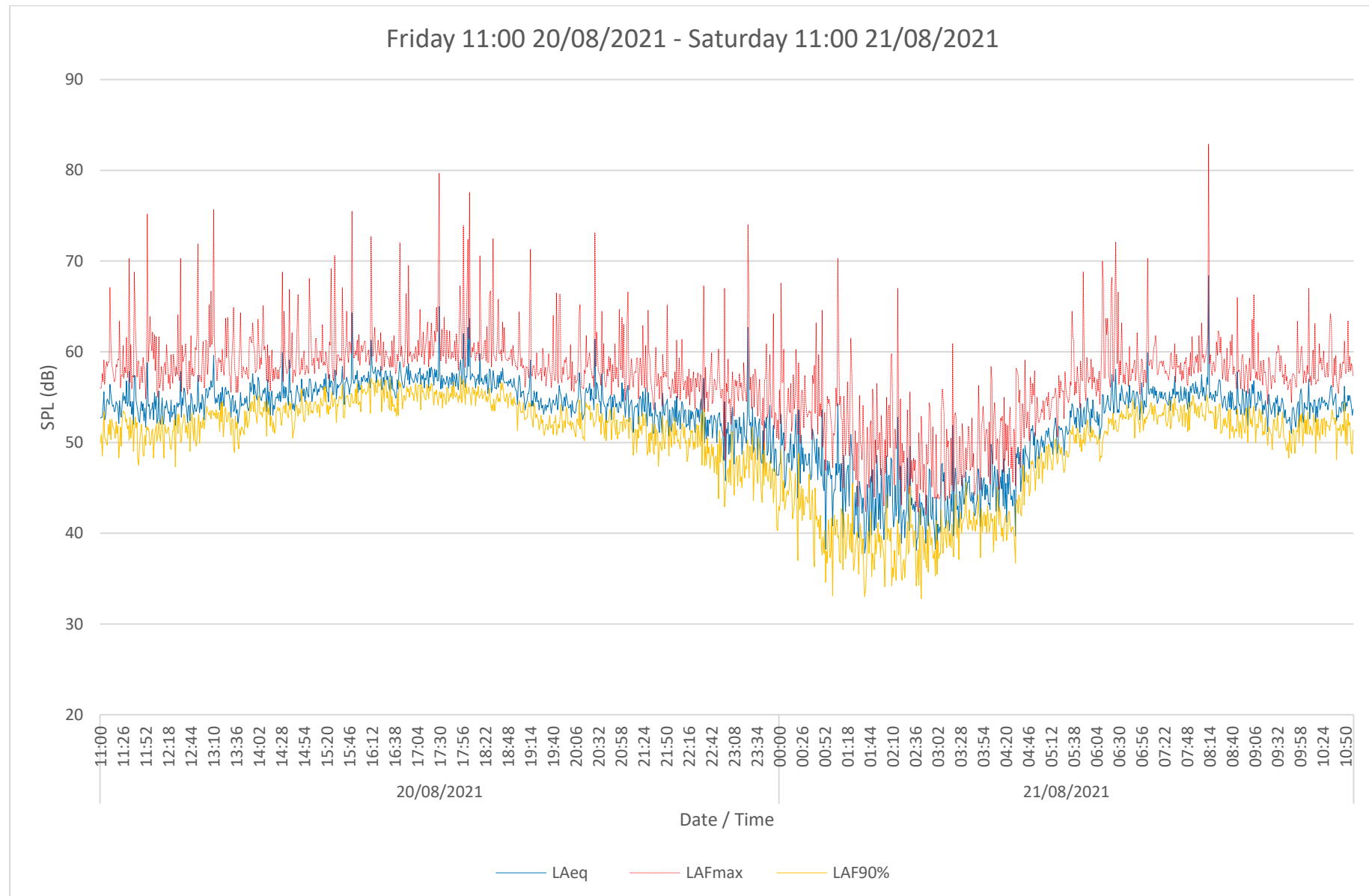


Figure B.4 – Time History at Position B

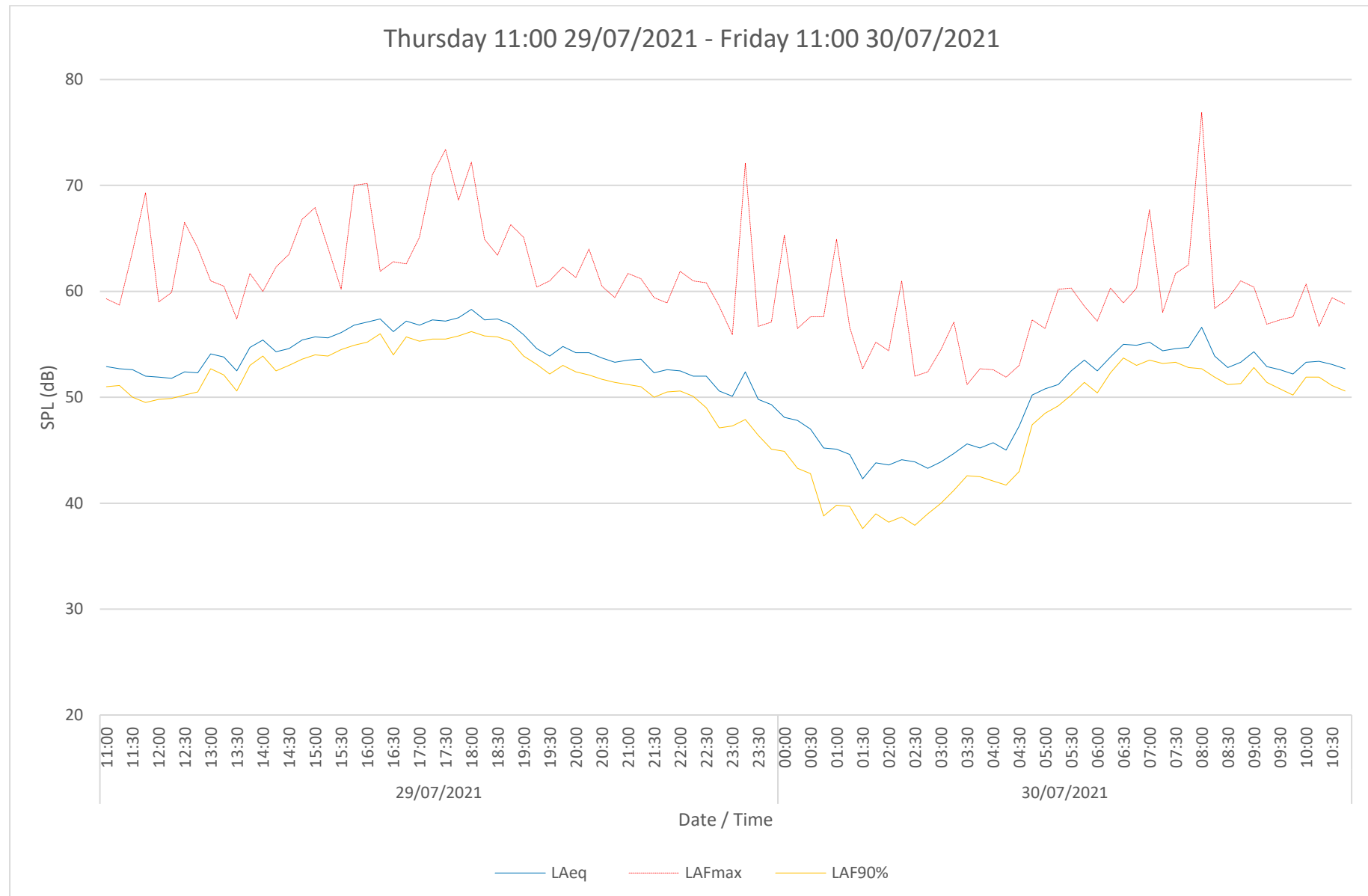


Figure B.5 – Statistical Analysis of Background Sound Levels Measured at Position A

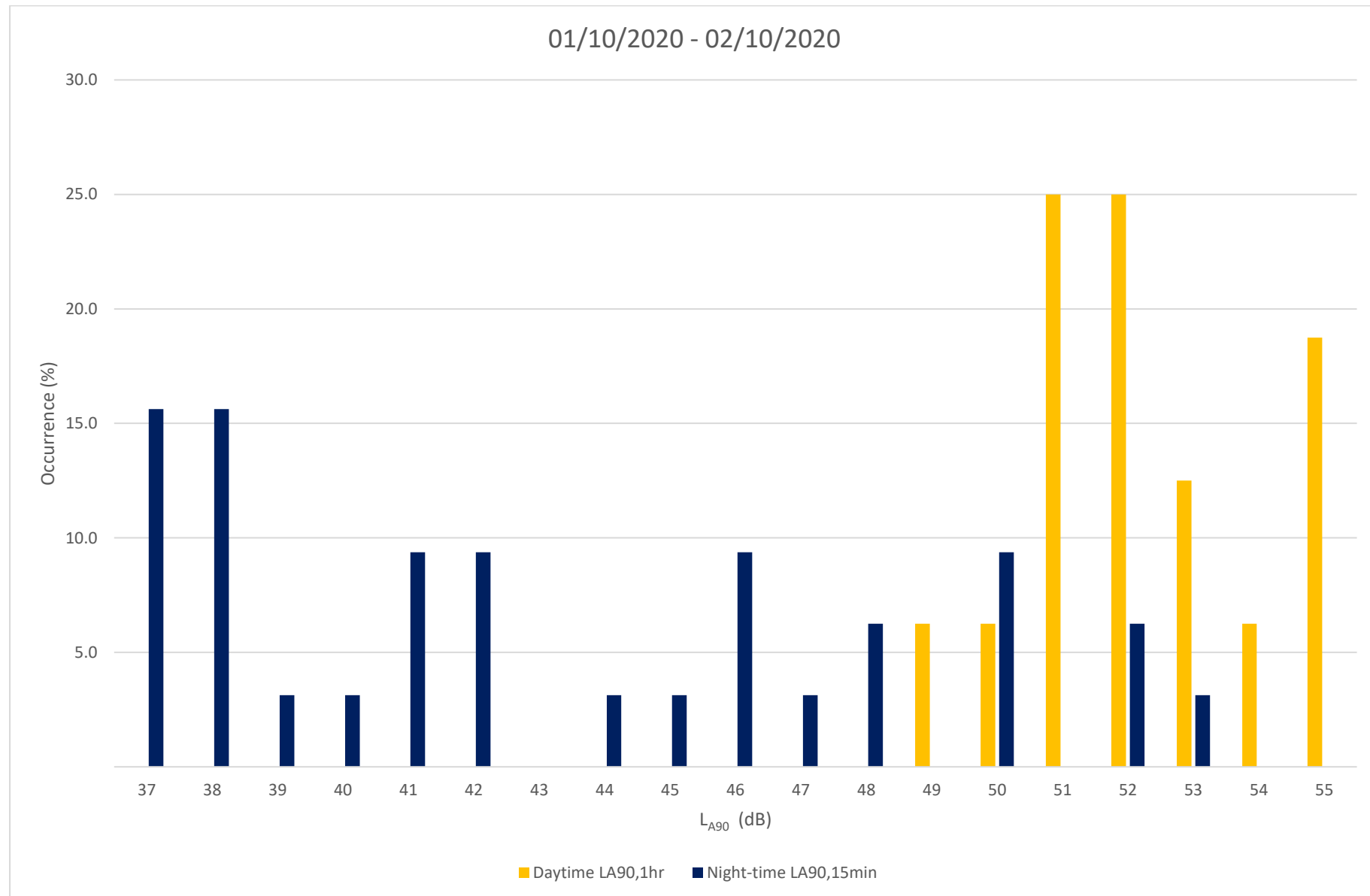


Figure B.6 – Statistical Analysis of Background Sound Levels Measured at Position B

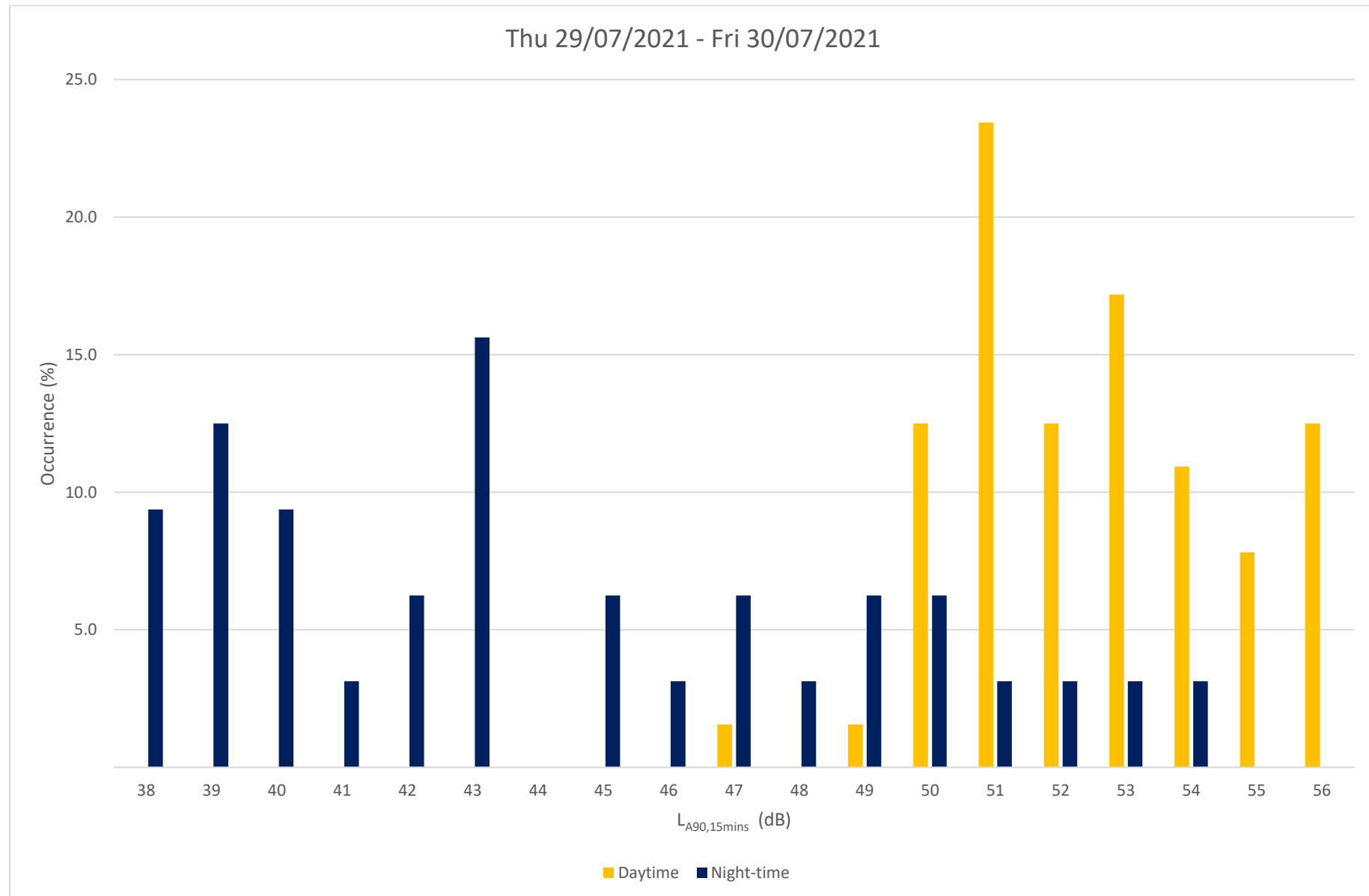


Figure B.7 – L_{eq} and $L_{max,F}$ Octave Band Spectra Measured at Position A (Friday, 20 August 2021)

