



**Independent Acoustic  
Consultancy Practice**

# **Environmental Noise Assessment**

**Land off Llewellyn Road  
Swansea**

6095/ENS1\_Rev1



## Independent Acoustic Consultancy Practice

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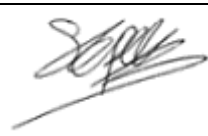



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## Environmental Noise Assessment

<b>Project:</b>	<b>Land off Llewellyn Road</b>
<b>Site Address:</b>	Penllergaer Swansea SA4
<b>HA Reference:</b>	6095/ENS1_Rev1
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## 1. INTRODUCTION

We understand a residential development consisting of 180no dwellings is proposed at Land off Llewellyn Road, Penllergaer, Swansea, SA4.

The Local Planning Authority have requested a noise impact assessment is submitted to accompany the planning application.

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.

### 1.1 COVID-19 Lockdown Restrictions

The environmental noise survey in this report was undertaken during a 'lockdown' period where restrictions on people's movements had been enforced by the Welsh Government due to the COVID-19 pandemic.

Reference is made to the Welsh Government noise maps to validate measured noise levels. This is in line with Institute of Acoustics and Association of Noise Consultants guidance for noise assessment during the current crisis.

## 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 <sup>(4)</sup>	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 British Standard 4142:2014

British Standard 4142:2014 “Methods for rating and assessing industrial and commercial sound”, provides current guidance for the assessment of industrial noise affecting residential receivers.

This standard describes a rating method comparing  $L_{Aeq}$  noise levels from the industrial source with pre-existing background  $L_{A90}$  levels at the residential receiver. It advises at a difference (industrial noise - background) of:

- +10dB or higher, likely to be an indication of a significant adverse impact, depending on the context.
- A difference of + 5dB, likely to be an indication of an adverse impact, depending on the context.
- 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.

A sliding scale of penalties can be applied to industrial/commercial sound levels which have acoustically distinguishing characteristics, including tonality, impulsivity and intermittency.

**Tonality** – A penalty of 2dB for a tone which is just perceptible at the noise receptor, 4dB where it is clearly perceptible, and 6dB where it is highly perceptible.

**Impulsivity** – A penalty of 3dB for impulsivity which is just perceptible at the noise receptor, 6dB where it clearly perceptible, and 9dB 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 3dB can be applied

**Intermittency** – If intermittency is readily distinctive against the residual acoustic environment, a penalty of 3dB can be applied.

**BS 4142:2014 states under section 11;**

*“Where the initial estimate of the impact needs to be modified due to the context, take all pertinent factors into consideration, including the following.*

- 1) The absolute level of sound. For a given difference between the rating level and the background sound level, the magnitude of the overall impact might be greater for an acoustic environment where the residual sound level is high than for an acoustic environment where the residual sound level is low.*

*Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night.*

*Where residual sound levels are very high, the residual sound might itself result in adverse impacts or significant adverse impacts, and the margin by which the rating level exceeds the background might simply be an indication of the extent to which the specific sound source is likely to make those impacts worse.”*

### 3. ENVIRONMENTAL NOISE SURVEY

#### 3.1 Procedures

##### 3.1.1 Continuous Monitoring

Continuous noise monitoring was carried out from 1052hrs on Monday, 08 March 2021 to 1114hrs on Tuesday, 09 March 2021 at positions A and B.

Data including  $L_{Amax}$ ,  $L_{Aeq}$  and background  $L_{A90}$  was logged at 1 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	At the north eastern boundary of the site, 445m south from M4 with no direct line of sight of the motorway.
B	At the southern eastern boundary of the site, 20m from the nearest farm’s barn.

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

### 3.1.2 CRTN Measurements

Additional sample measurements were taken in accordance with the Department of Transport's 'Calculation of Road Traffic Noise' (CRTN) Shortened Measurement Procedure on Monday, 08 March 2021. Parameters recorded include  $L_{max}$  and  $L_{eq}$  levels including 1/3 octave band spectra.

Site plan in Figure 3.1 shows the sample measurement positions used, namely:

**Table 3.2 – Sample Measurement Location Details**

Position	Description
1	On the western boundary, 43m east from "The Manse - Luxury Holiday Home".
2	At the northern boundary.
3	On the southern boundary, at the end of Mount Crescent, 20m from nearest dwelling.

*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 3.3 – 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
NTi	Type 1 - Sound Level Meter	XL2-TA	A2A-10021-E0	20 August 2019	TCRT19/1651
	Preamplifier	MA220	5435	20 August 2019	TCRT19/1651
	Microphone	Capsule	8547	20 August 2019	TCRT19/1651
NTi	Type 1 - Sound Level Meter	XL2-TA	A2A-14577-E0	22 June 2020	TCRT20/1313
	Preamplifier	MA220	7485	22 June 2020	TCRT20/1313
	Microphone	Capsule	A15594	22 June 2020	TCRT20/1313
Norsonic AS	Calibrator (113.95dB @ 999.27Hz)	1251	24202	14 August 2020	U35462

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

#### 3.4.1 Continuous Monitoring

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

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

**Table 3.4 – Summary of Daytime  $L_{Aeq,16hr}$  and Night-time  $L_{Aeq,8hr}$  Results**

Period	Date	Position	
		A	B
Daytime $L_{Aeq,16hr}$ (dB)	08-09/03/2021	45	48
Night-time $L_{Aeq,8hr}$ (dB)	08-09/03/2021	45	45*

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

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

*\* Note: The dawn chorus between 0558-0621hrs at Position B affected the overall  $L_{Aeq,8hr}$  night-time measurement. This has been excluded from the measurement results. The results at Position B with the dawn chorus included are 47dB  $L_{Aeq}$ .*

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

**Table 3.5 – Minimum Consistent Daytime and Night-time Background  $L_{A90}$  Results**

Period	Position	
	A	B
Daytime (0700-2300hrs) $L_{A90}$ (dB)	38	40
Night-time (2300-0700hrs) $L_{A90}$ (dB)	36	36

The background and ambient noise climate was controlled by distant road traffic noise during the day and night-time period at both locations.

### 3.4.2 CRTN Measurements

Results of sample measurements taken in accordance with the Department of Transport's 'Calculation of Road Traffic Noise – Shortened Measurement Procedure' are shown in Table 3.6 below;

**Table 3.6 – CRTN Measurement Results**

CRTN Position 1	$L_{Aeq}$ (dB)	$L_{A10}$ (dB)	$L_{Amax,F}$ (dB)
1105-1115hrs	44.0	46.5	61.5
1200-1210hrs	40.5	42.8	52.5
1300-1310hrs	39.3	40.9	60.8
Mean $L_{A10}$	43.4		
**16hr $L_{Aeq}$	40.4		

CRTN Position 2	$L_{Aeq}$ (dB)	$L_{A10}$ (dB)	$L_{Amax,F}$ (dB)
1118-1128hrs	38.3	39.3	58.3
1213-1223hrs	40.6	42.3	54.8
1313-1323hrs	47.8	47.5	68.5
Mean $L_{A10}$	43.0		
**16hr $L_{Aeq}$	40.0		

CRTN Position 3	$L_{Aeq}$ (dB)	$L_{A10}$ (dB)	$L_{Amax,F}$ (dB)
1131-1141hrs	42.3	43.5	69.1
1226-1236hrs	43.1	44.9	65.1
1325-1335hrs	41.5	43.3	61.2
Mean $L_{A10}$	43.9		
**16hr $L_{Aeq}$	40.9		

\*\*Predicted in accordance with CRTN and TAN11

$L_{eq}$  and  $L_{max,F}$  spectra measured at positions 1-3 are included in Figure B.5 of Appendix B.

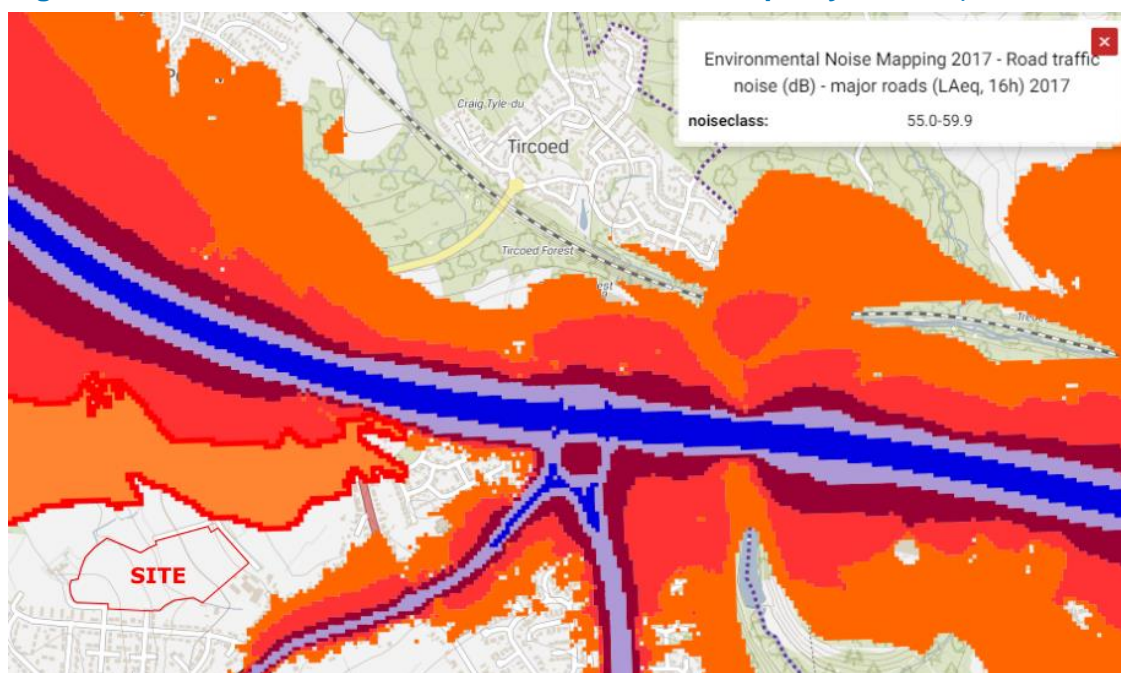


#### 4. VALIDATION OF RESULTS

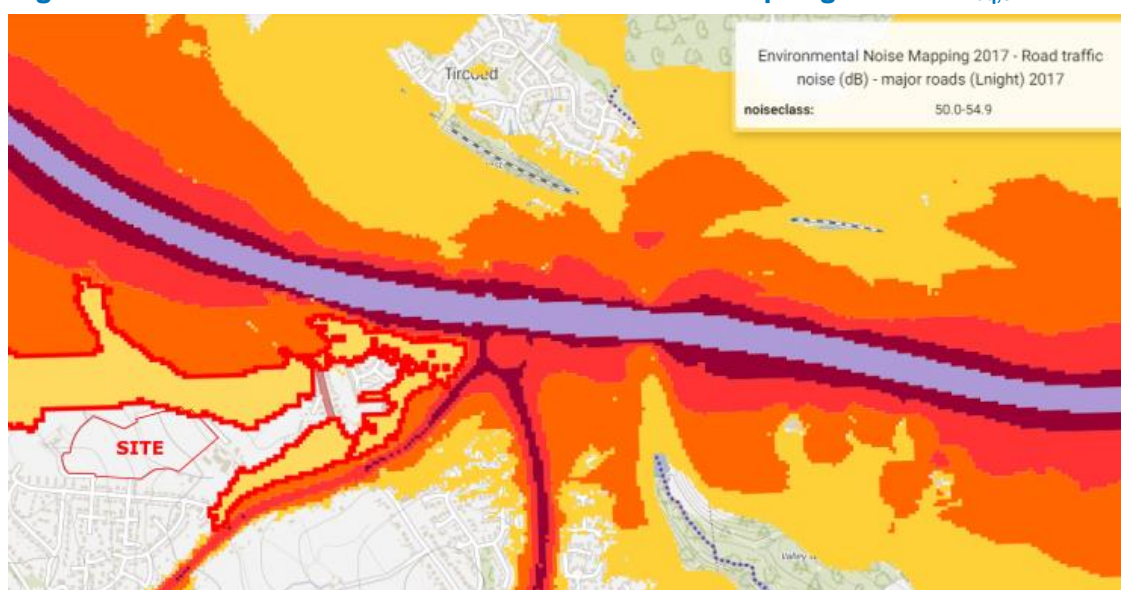
As outlined in Section 1.1, the Welsh Government had imposed restrictions on people’s movements at the time of the noise survey as part of their response to the COVID-19 pandemic.

Strategic noise map modelling from 2017 carried out by the Welsh Government as part of The Environmental Noise Directive has been used to validate noise survey results.

**Figure 4.1 – Welsh Government Road Traffic Noise Map Daytime  $L_{Aeq,16hr}$  2017**



**Figure 4.2 – Welsh Government Road Traffic Noise Map Night-time  $L_{Aeq,8hr}$  2017**





Welsh Government guidance around this mapping states, *“The values are calculated, not measured, and should be treated with caution when looking at specific locations.”*

The noise map model above indicates the site falls below 55dB  $L_{Aeq,16hr}$  daytime. The northern site boundary was measured at a level of 45dB  $L_{Aeq,16hr}$ .

During the night, the noise maps suggest around a 5dB reduction from daytime levels. In our experience, this may reduce to 3-4dB from the M4 motorway. Our survey indicated 0-3dB reduction from day to night.

The measured levels may therefore be atypically low due to COVID-19 restrictions, however if a robust, worst case approach is taken and a level of 55dB  $L_{Aeq,16hr}$  is assumed at the northern site boundary during the day and 50dB  $L_{Aeq,8hr}$  during the night;

- The site boundaries are on the boundary of NEC A/B of TAN11 during the day and under NEC B of TAN11 at night
- All gardens are still indicated to meet the 55dB  $L_{Aeq,16hr}$  criteria
- Standard thermal double glazing with trickle ventilators is still indicated sufficient to control road traffic noise intrusion

Conclusions formed in subsequent sections of this report are therefore considered valid.

## 5. FARM ACTIVITY

A farm yard is located to the south east corner of the proposed development. The farm consists of several agricultural buildings with tractors and trailers. During the 24-hour measurement period, 16 minutes of farm activity was detected at Position B. This consisted of a tractor driving around the farm and barns.

Hunter Acoustics have been informed by the farm owner that the measured activity was representative of likely activity once the development has been built. Animals would no longer be housed in the barns and there would likely only be vehicular access for storage.

An assessment has been carried out to determine the impact of the activity generated by the farm on the most critical residential dwellings in relation to the tractor's location.

### 5.1 Source Data

A source noise level of 79dB  $L_{Amax,F}$  at 10m has been used for the tractor (referenced data for a tractor towing trailer from BS 5228-1:2009).

Based on measured activity during our survey, we have modelled 2no tractors in and out during the 1hr daytime assessment period.

### 5.2 Noise Map Modelling

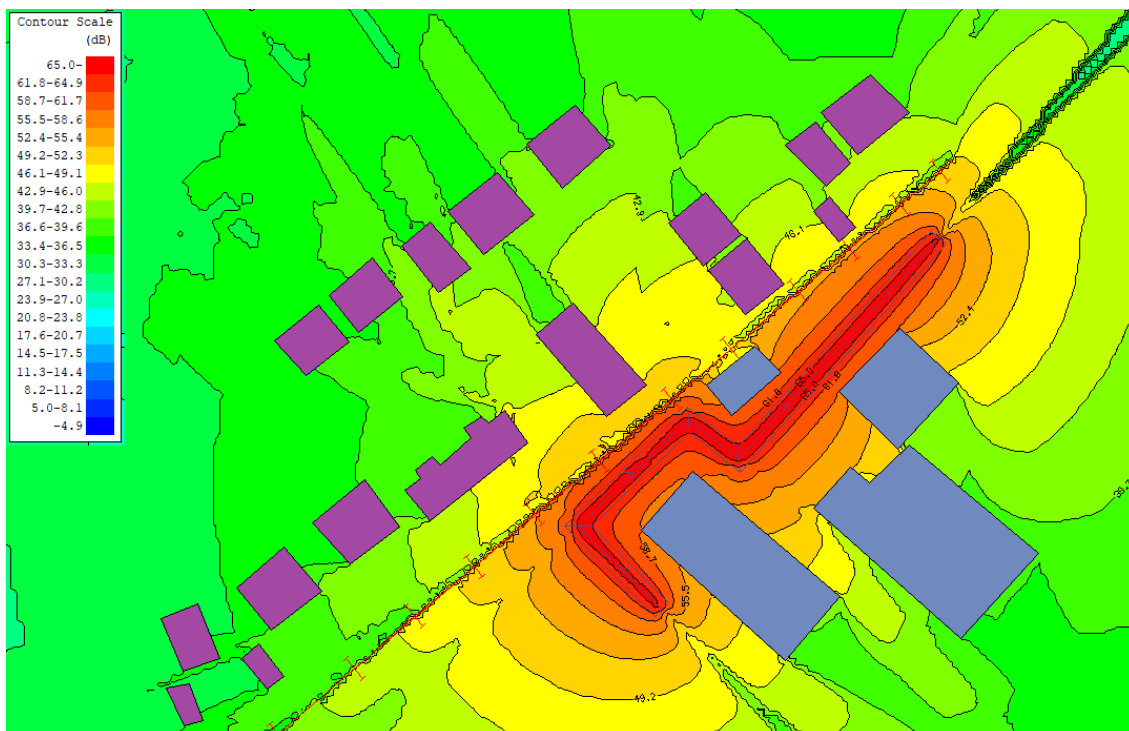
Three dimensional noise map modelling has been undertaken using the proprietary NoiseMap Five environmental noise mapping software package, which in turn uses calculation methods of British Standard 5228-1:2009.

The model takes into account distance and screening losses from existing and new structures, allowing garden noise levels to be assessed, as well as predicting noise levels at proposed residential facades.

The proposed housing layout plan referenced in Appendix C has been used for the developed model. Buildings in **PURPLE** are the proposed residential dwellings, buildings in **BLUE** are the existing farm barns.

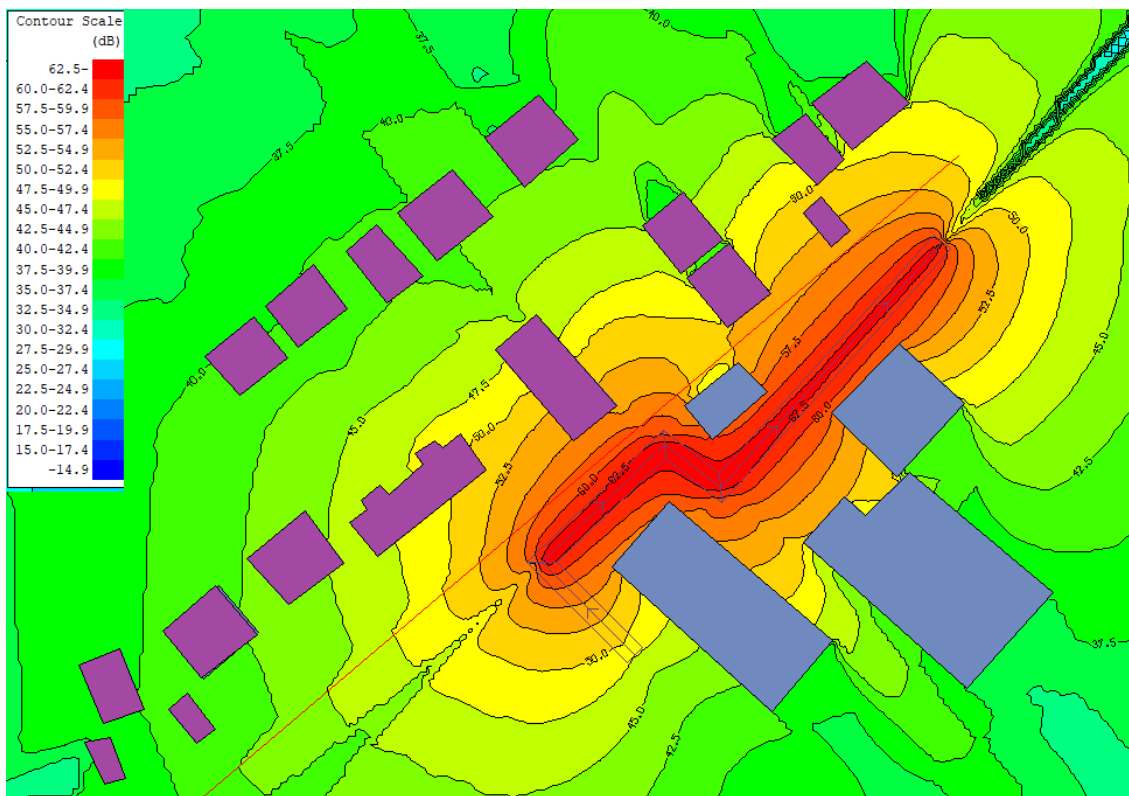
Noise map models in Figure 5.1 and Figure 5.2 below show predicted tractor noise levels at 1.5m and 4.5m above local ground level on the developed site respectively.

**Figure 5.1 - Developed Site  $L_{Aeq,1hr}$  Contours at 1.5m Height**



*Note: 1.8m high closed boarded fences have been modelled around residential boundary (critical areas modelled only).*

**Figure 5.2 - Developed Site  $L_{Aeq,1hr}$  Contours at 4.5m Height**



### 5.3 Discussion

Predicted  $L_{Aeq,1hr}$  noise levels at the nearest proposed dwellings are in the range of 47-49dB at ground floor level and 50-53dB at first floor level.

The following sets out the context around the assessment;

- We understand use is likely to be limited to storage in the barns and occasional access is therefore indicated (only 16mins of vehicle movements indicated in the 24hr noise monitoring period).
- Noise events are indicated to occur during daytime hours
- Garden levels are indicated to remain below the 55dB  $L_{Aeq,16hr}$  level from vehicle noise
- With an estimated 25dB loss through standard thermal double glazing and trickle ventilators, internal levels with windows closed and trickle ventilators open are indicated to easily meet desirable daytime levels of 35dB from BS 8233:2014 at both ground and first floor levels.

Based on the above, we would not assess this as having a significant adverse impact.

## 6. DISCUSSION

The site is indicated to fall mainly under NEC A of TAN11 during both the daytime and night-time.

Table 1 of TAN11 states that for sites falling under NEC A, *"Noise need not be considered as a determining factor in granting planning permission, although the noise level at the high end of the category should not be regarded as desirable."*

### 6.1 Road Traffic Noise Intrusion

Standard thermal double glazing and trickle ventilation is indicated sufficient to control noise intrusion to habitable rooms to meet desirable levels referenced in BS 8233:2014 (see section 2.4).

### 6.2 External Noise Assessment (Gardens)

Measured noise levels in Section 0 indicate the  $L_{Aeq,16hr}$  55dB in 50% of garden area criterion is achieved in all private garden areas across the site.

## 7. CONCLUSION

An environmental noise assessment has been carried out for the proposed residential development at Land off Llewellyn Road, Penllergaer, Swansea, SA4.

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

A noise survey have been carried out across the site. The site in its undeveloped state is indicated to fall mainly under NEC A of TAN11.

Table 1 of TAN11 states that for sites falling under NEC A, *“Noise need not be considered as a determining factor in granting planning permission, although the noise level at the high end of the category should not be regarded as desirable.”*

Standard thermal double glazing and trickle ventilation is indicated sufficient to control noise intrusion to habitable rooms to meet desirable levels referenced in BS 8233:2014 (see section 2.4).

An assessment of external noise in gardens has been undertaken and shows that all gardens meet the  $L_{Aeq,16hr}$  55dB garden criterion.

An assessment of likely farm yard activity is included in Section 0. The context is outlined and it is concluded that occasional vehicular activity around the barns is unlikely to have a significant adverse impact.

## APPENDIX A - ACOUSTIC TERMINOLOGY

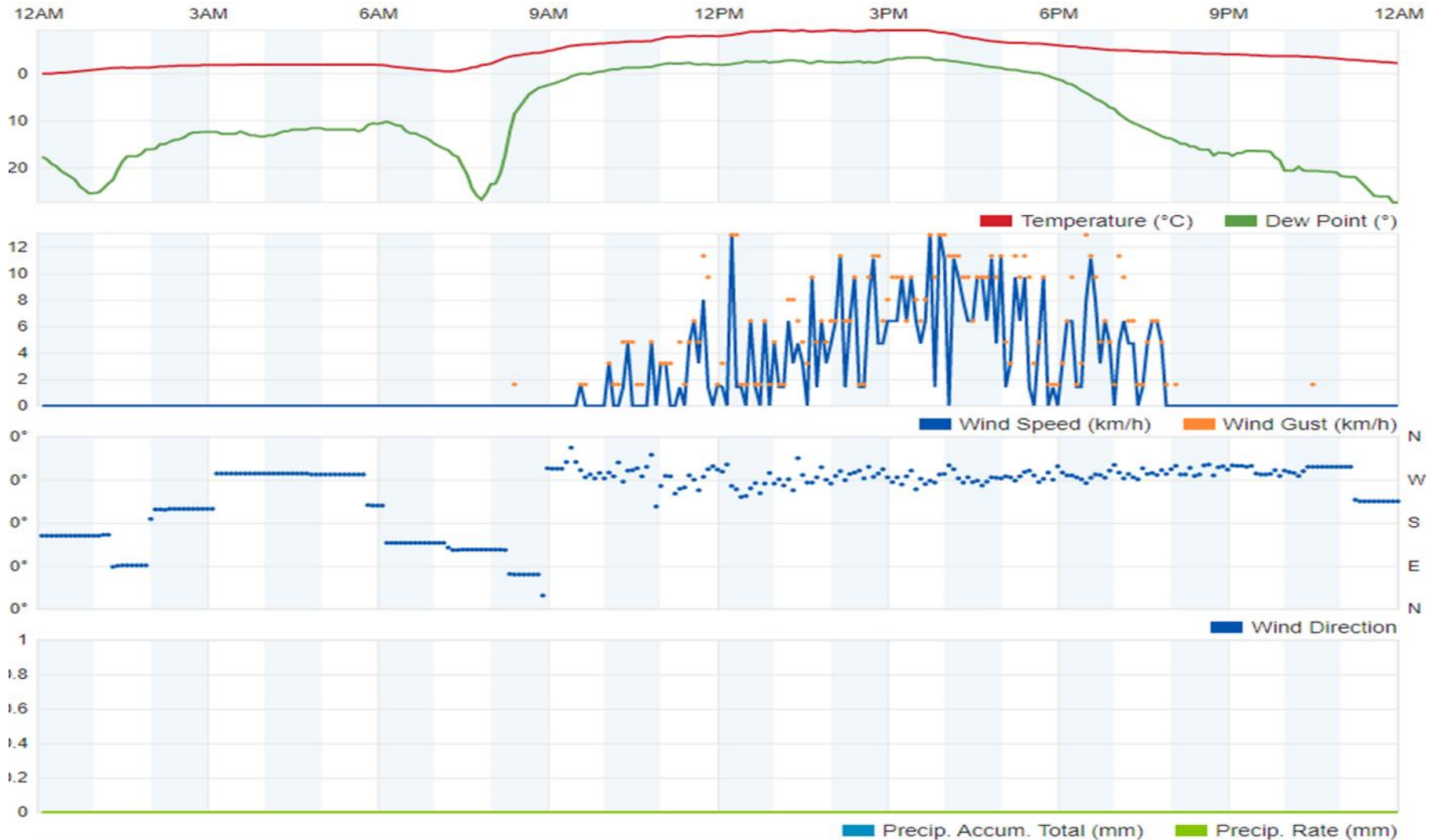
Human response to noise depends on a number of factors including loudness, frequency content and variations in level with time. Various frequency weightings and statistical indices have been developed in order to objectively quantify 'annoyance'.

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.
$L_{A,r,Tr}$	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

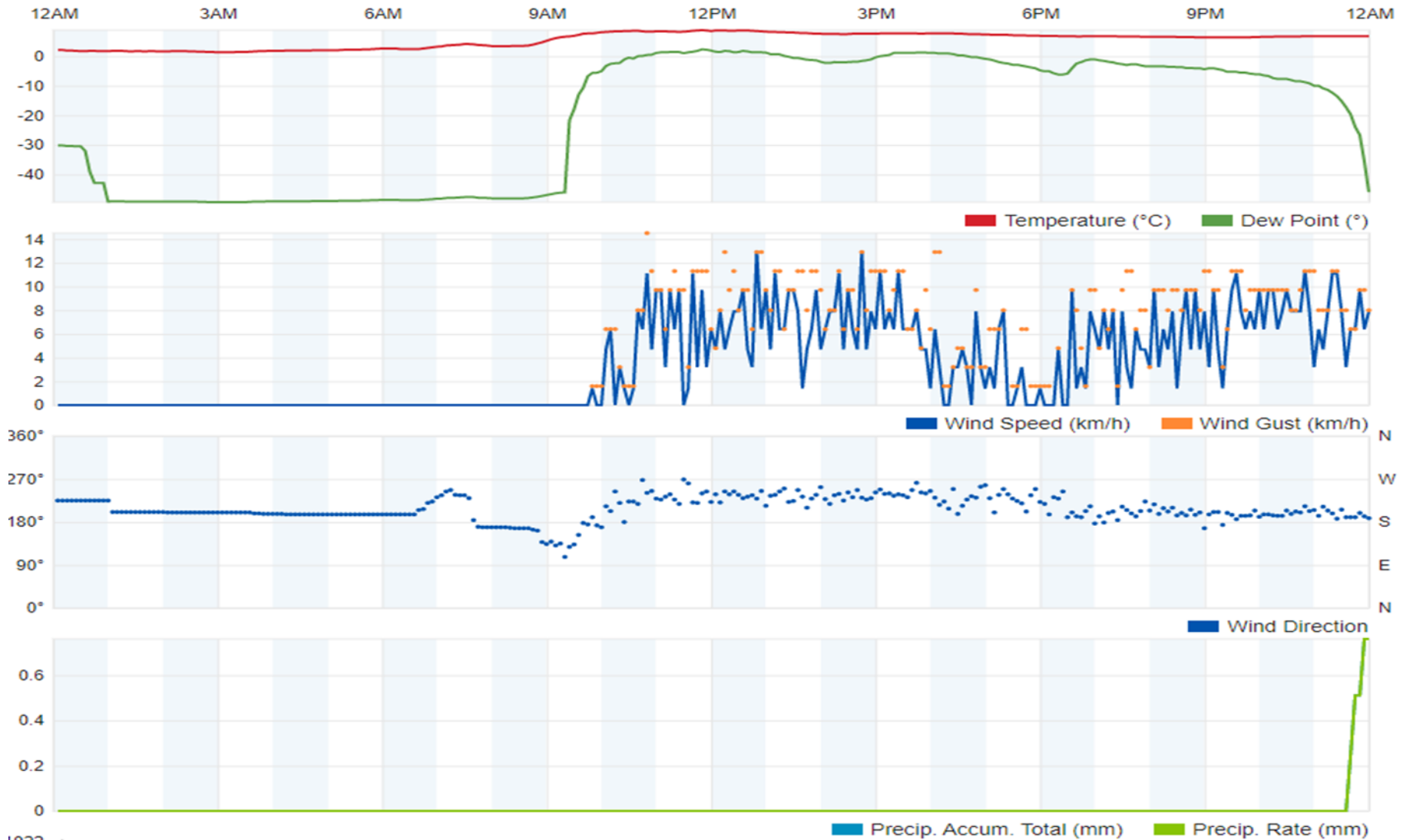
## APPENDIX B - DIAGRAMS, GRAPHS AND TABLES

Figure B.1 – Approximate Weather History for Monday, 08 March 2021



Note: Taken from [www.wunderground.com](http://www.wunderground.com) - weather station IMORRIST4 located in Morriston [Elev 129 m, 51.67 °N, 3.94 °W]

Figure B.2 – Approximate Weather History for Tuesday, 09 March 2021



Note: Taken from [www.wunderground.com](http://www.wunderground.com) - weather station IMORRIST4 located in Morrison [Elev 129 m, 51.67 °N, 3.94 °W]



Figure B.3 – Time History at Position A (Monday, 08 March 2021 to Tuesday, 09 March 2021)

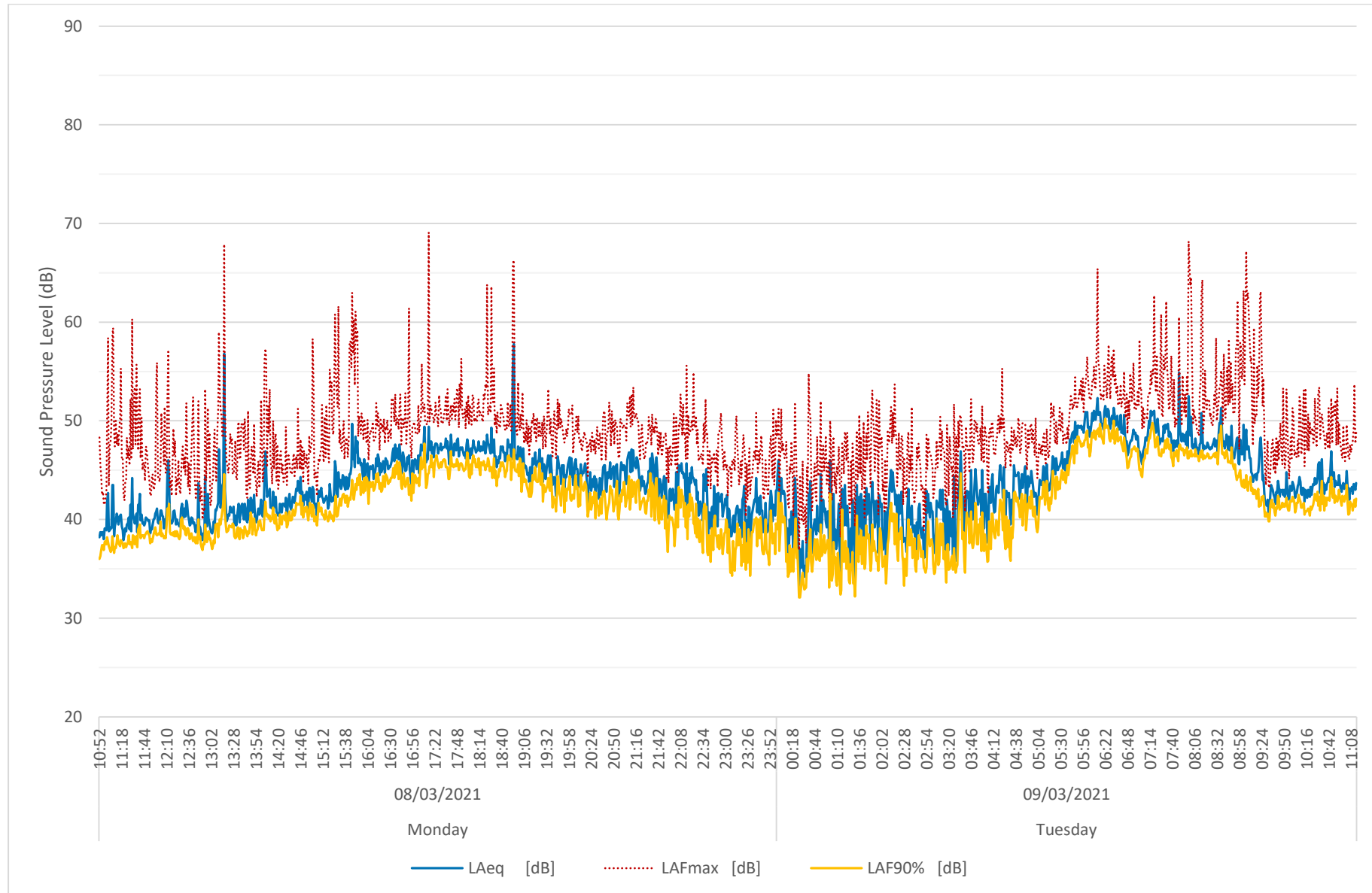


Figure B.4 – Time History at Position B (Monday, 08 March 2021 to Tuesday, 09 March 2021)

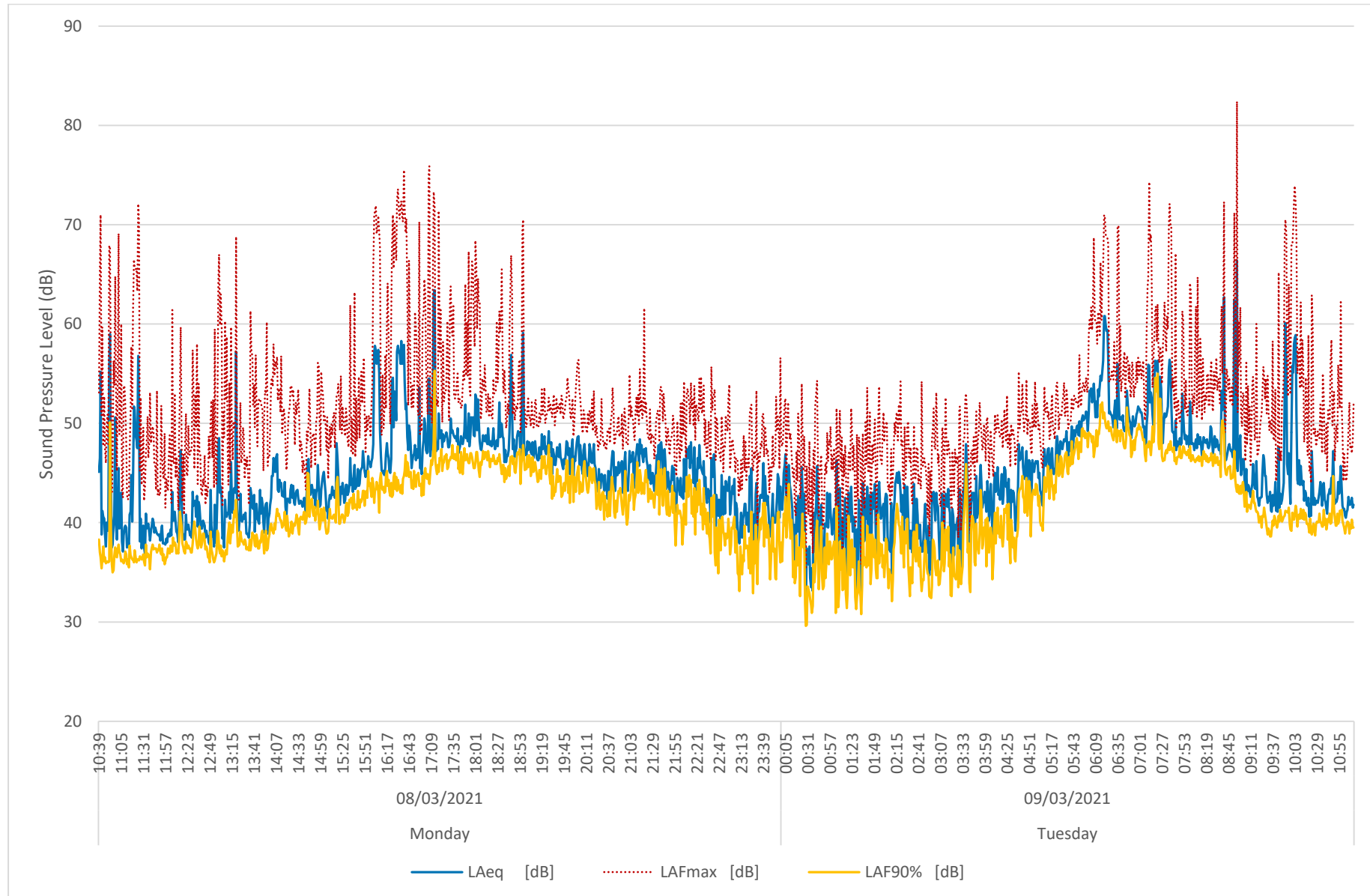
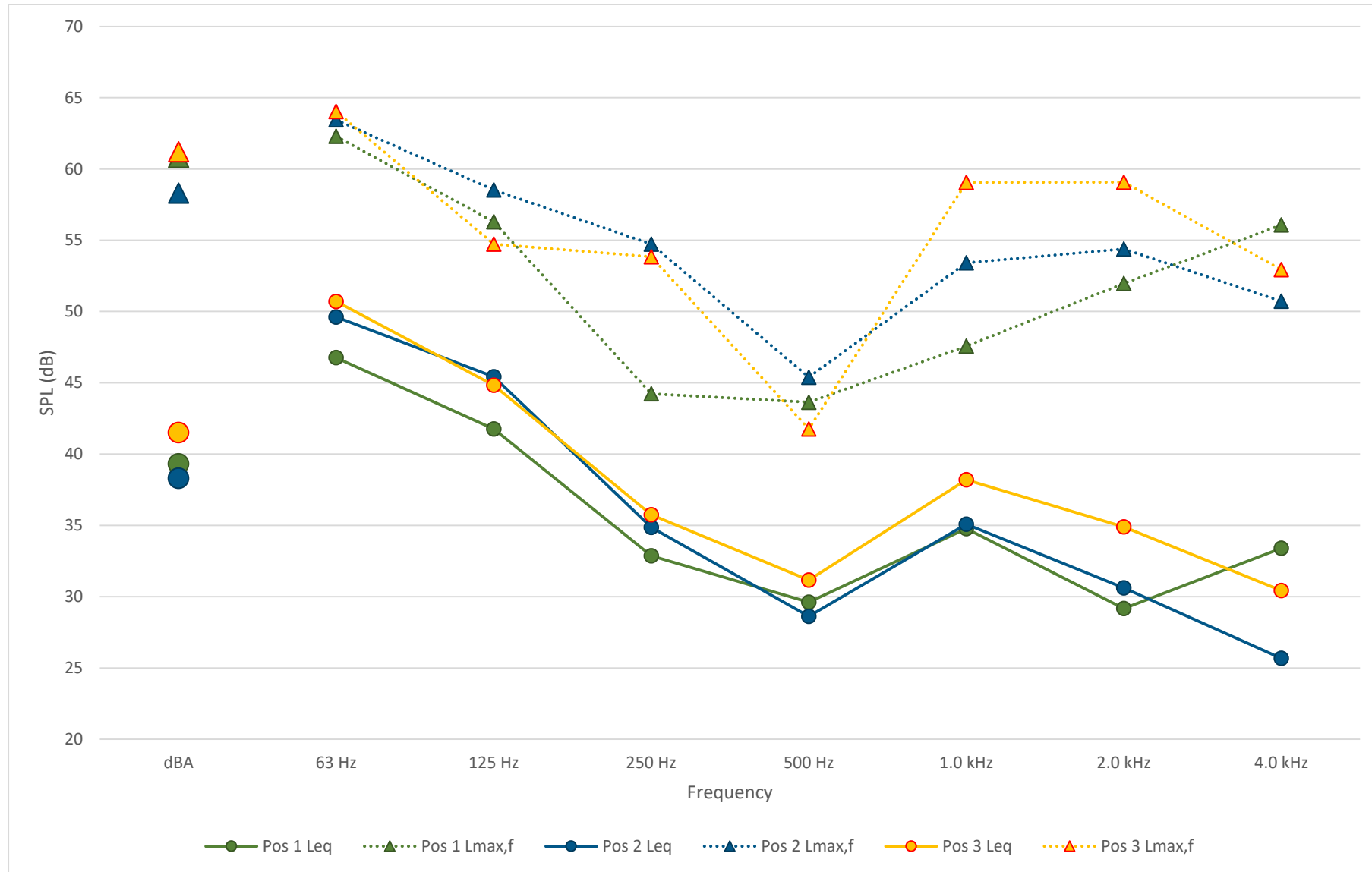


Figure B.5 –  $L_{eq}$  and  $L_{max,F}$  Octave Band Spectra Measured at Positions 1-3 (Monday, 08 March 2021)



## APPENDIX C - DRAWING LISTS

The following The Urbanists drawings and documents have been used in our assessment;

**Table C.1 – Drawing List**

Drawing Title	Drawing Number	Rev	Date
Planning Layout	1898-URB-UD-XX-XX-DR-90-001	E	10/02/2021