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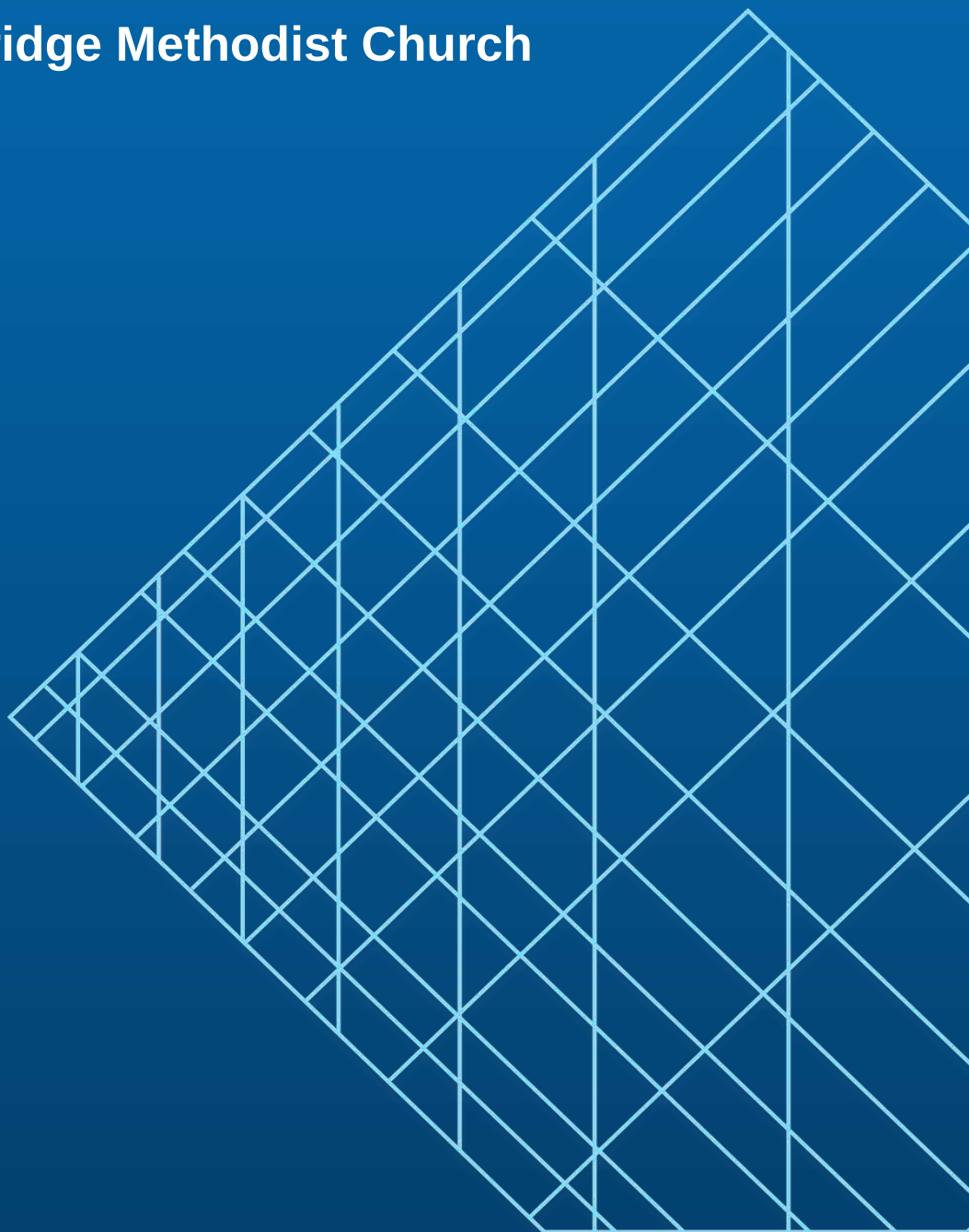
Independent Acoustic Consultancy Practice

Noise Impact Assessment

Former Newbridge Methodist Church
Newbridge

7152/NIA1_Rev1



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Noise Impact Assessment

Project:	**Former Newbridge Methodist Church**
Site Address:	Bridge Terrace Newbridge NP11 5FH
HA Reference:	7152/NIA1_Rev1
Date:	09/02/2024
Client:	Highlight Planning Office 33 14 Neptune Court Vanguard Way Cardiff CF24 5PJ
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ISSUE / REVISION

Rev	Date			
0	29 January 2024	**Filename**	24.7152_NIA1	
		Description	First issue	
			Prepared by:	**Checked by:**
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1	09 February 2024	**Filename**	24.7152_NIA1_Rev1	
		Description	Updated delivery hours	
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2	15 February 2024	**Filename**	24.7152_NIA1_Rev2	
		Description	Updated following client comments	
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1. INTRODUCTION

We understand a convenience store is proposed at the Former Newbridge Methodist Church, Bridge Terrace, Newbridge, NP11 5FH.

Noise associated with the proposed convenience store is to consist of activity from vehicles accessing the car park, deliveries and external plant.

The site is proposing to have the potential to operate 0600-2300hrs, 7 days a week.

A noise impact assessment is required to accompany the planning application.

This report has therefore been commissioned to determine existing background sound levels and predict noise levels from proposed activities and plant, allowing an assessment of the impact to nearby noise sensitive receivers to be made.

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 Technical Advice Note (Wales) 11

The below summarises the advice given TAN11 (1997) regarding new noise generating developments.

"3. This note provides advice on how the planning system can be used to minimise the adverse impact of noise without placing unreasonable restrictions on development or adding unduly to the costs and administrative burdens of business. It outlines some of the main considerations which local planning authorities should take into account in drawing-up development plan policies and when determining planning applications for development which will either generate noise or be exposed to existing noise sources.

4. Local authorities should adopt a corporate approach and ensure close co-operation between planning and environmental health departments when considering noise and noise generating developments.

Development Control
Noise generating development
8. Local planning authorities must ensure that noise generating development does not cause an unacceptable degree of disturbance. They should also bear in mind that if

subsequent intensification or change of use results in greater intrusion, consideration should be given to the use of appropriate conditions.

9. Noise characteristics and levels can vary substantially according to their source and the type of activity involved. In the case of industrial development, for example, the character of the noise should be taken into account as well as its level. Sudden impulses, irregular noise or noise which contains a distinguishable continuous tone will require special consideration. In addition to noise from aircraft landing and taking off, noise from aerodromes is likely to result from engine testing as well as ground movements. The impact of noise from sport, recreation and entertainment will depend to a large extent on frequency of use and the design of facilities. Advice on assessing noise and on factors to consider in relation to the major noise sources including roads, railways, airports, industrial and recreational noise and their measurement is given in Annex B.

Noise from industrial and commercial developments

B17. The likelihood of complaints about noise from industrial development can be assessed, where the Standard is appropriate, using guidance in BS 4142: 1990. Tonal or impulsive characteristics of the noise are likely to increase the scope for complaints and this is taken into account by the "rating level" defined in BS 4142. This "rating level" should be used when stipulating the level of noise that can be permitted. The likelihood of complaints is indicated by the difference between the noise from the new development (expressed in terms of the rating level) and the existing background noise. The Standard states that, 'A difference of around 10 dB or higher indicates that complaints are likely. A difference of around 5 dB is of marginal significance'. Since background noise levels vary throughout a 24 hour period it will usually be necessary to assess the acceptability of noise levels for separate periods (e.g. day and night) chosen to suit the hours of operation of the proposed development. Similar considerations apply to developments that will emit significant noise at the weekend as well as during the week. In addition, general guidance on acceptable noise levels within buildings can be found in BS 8233: 1987."

TAN11 refers to BS 4142:1997 and BS 8233:1987. These have been superseded by BS 4142:2014+A1:2019 (see Section 2.3 below) and BS 8233:2014 (see Section 2.4 below).

2.5 British Standard 4142:2014+A1:2019

British Standard 4142:2014+A1:2019 "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.

2) *The character and level of the residual sound compared to the character and level of the specific sound. Consider whether it would be beneficial to compare the frequency spectrum and temporal variation of the specific sound with that of the ambient or residual sound to assess the degree to which the specific sound source is likely to be distinguishable and will represent an incongruous sound by comparison to the acoustic environment that would occur in the absence of the specific sound. Any sound parameters, sampling periods and averaging time periods used to undertake character comparisons should reflect the way in which sound of an industrial and/ or commercial nature is likely to be perceived and how people react to it.*

   NOTE 3 Consideration should be given to evidence on human response to sound and, in particular, industrial and/or commercial sound where it is available. A number of studies are listed in the "Effects on humans of industrial and commercial sound" portion of the "Further reading" list in the Bibliography.

3) *The sensitivity of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions, such as:*

   i) facade insulation treatment;
   ii) ventilation and/or cooling that will reduce the need to have windows open so as to provide rapid or purge ventilation; and
   iii) acoustic screening."

In addition to the above, the Association of Noise Consultants (ANC) have produced a Technical Note to BS 4142:2014+A1:2019, dated March 2020 (v1.0).

It states under 'Other Contextual Matters' – *"The assessor may also wish to consider matters such as the:*

character of a particular neighbourhood;
former uses at or close to a site;
legitimacy of the industrial use, e.g. planning permissions or environmental permits;
implementation of best practicable means for a given process or activity; or
local convention or perceptions.

When relying on such matters, it is incumbent for the assessor to make clear all elements of context."

It goes on to say, *"There is no theoretical limit to how the context can or should influence the impact assessment, but any alteration of the conclusions of an assessment due to context should be sufficiently explained and justified for the specific circumstances in question."*

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 2.1 – 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 Design Manual for Roads and Bridges (DMRB)

There is no specific recognised methodology for assessing vehicle noise emissions from car parks ore drive-thrus, although it is a known source of potential disturbance and concern for neighbouring residents.

An approach to assessing noise effects from roads is described in Volume 11 of *Design Manual for Roads and Bridges*, 2008 (DMRB), relating to environmental impact assessment. The DMRB approach is to compare noise levels for the 'do something' (with scheme) scenario against noise levels for the 'do minimum' (without scheme) scenario.

This procedure has been used in this assessment by examining the changes in levels of road traffic noise that would result from the implementation of the development proposals.

DMRB quotes the following impact ranges for changes in road traffic noise;

Table 2.2 – Road Traffic Magnitude of Impact Table

Noise change, $L_{A10,18h}$	Magnitude of Impact
0	No change
0.1 – 0.9	Negligible
1 – 2.9	Minor
3 – 4.9	Moderate
5+	Major

This assessment compares (L_{Aeq}) noise levels from proposed car park with the existing measured (L_{Aeq}) noise levels.

The scale or severity of any noise change, positive or negative, requires description to indicate the degree of impact where possible. Significance criteria are then applied to

categories of change. A change threshold of 3dB(A) has commonly been used in traffic noise assessments in the UK to approximate the threshold of significance.

Significance criteria shown in the table below have been developed based upon DMRB guidance, to assess noise effects arising from the operation of the proposed car park.

Table 2.3 - Significance Criteria based upon DMRB

Change in Noise Level $L_{Aeq,1hr}$ (dB)	Magnitude Criteria	Significance
>5.0	Major Adverse	Significant
3.0 to 4.9	Moderate adverse	
1.0 to 2.9	Minor Adverse	Insignificant
0.1 to 0.9	Negligible	
0	No Change	
-0.9 to -0.1	Negligible	
-2.9 to -0.1	Minor Beneficial	
-4.9 to -3.0	Moderate Beneficial	Significant
> -5.0	Major Beneficial	

2.6 Liaison with Local Planning Authority Pollution Control

The Local Planning Authority's environmental health department have not set a numerical value with regards to rating level excess over background for fixed services plant.

We would therefore advise at this stage, that a BS 4142 assessment should be carried out by a suitably qualified acoustician once plant locations and selections have been determined to ascertain what, if any, mitigation measures may be required.

We would advise aiming for a low impact when assessed in accordance with BS 4142 at this stage.

3. SOUND SENSITIVE RECEIVERS

In order to set environmental noise limits, it is first necessary to define the existing ambient and background sound climate at the agreed nearest Sound Sensitive Receivers (SSRs).

Figure 3.1 below shows the development site and the closest existing SSRs. The adjacent building to the site is a workshop and the commercial buildings across the road are not considered to be sound sensitive to the proposed operations of the site.

Figure 3.1 - Site Plan Showing Nearest SSRs & Measurement Location

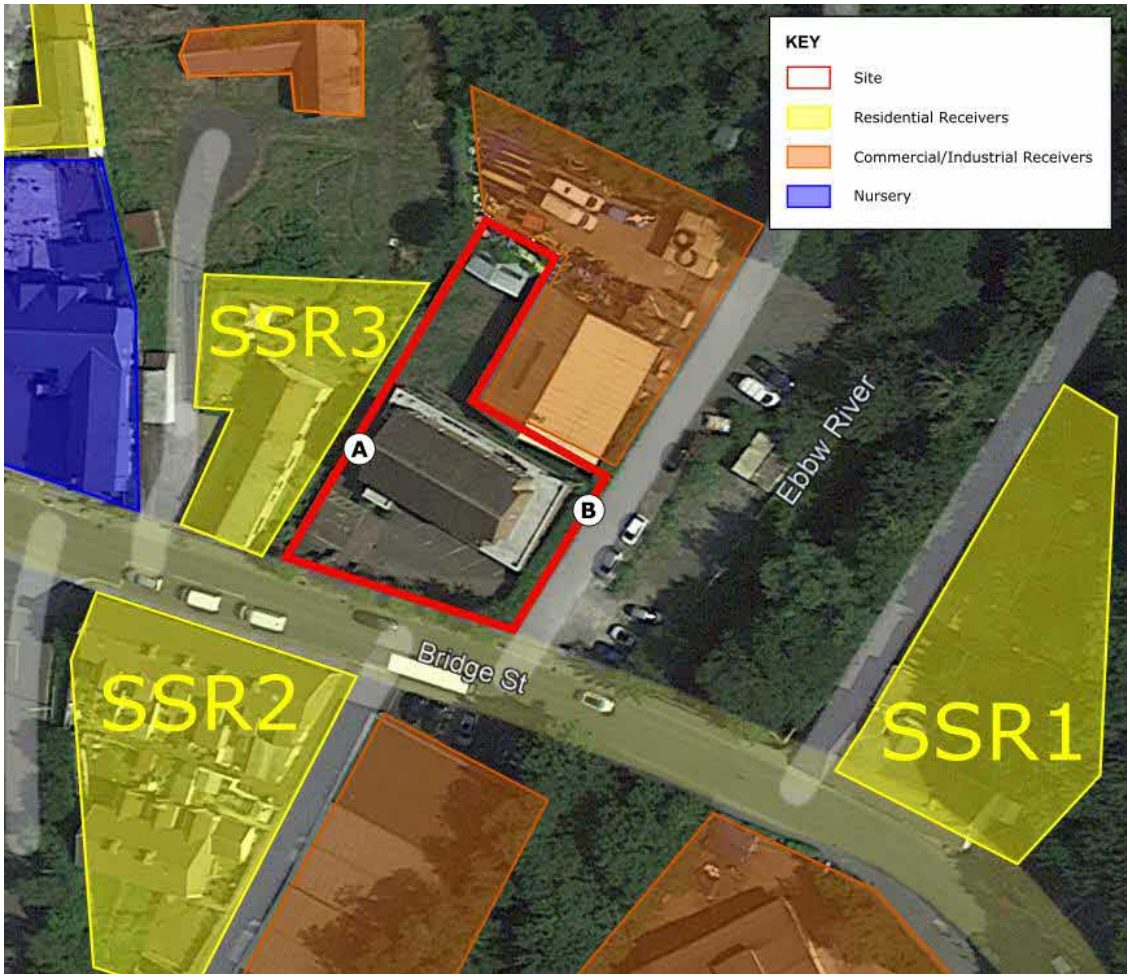


Table 3.1 –Sound Sensitive Receivers (Distance to Nearest Boundary)

SSR	Description	Approximate Distance (m)
1	Residential dwellings along Riverside Terrace and Bridgend Street	45
2	Residential dwellings at 4-9 Bridge Street	24
3	Residential dwelling ‘Ty-Hir’	5

4. ENVIRONMENTAL NOISE SURVEY

4.1 Procedures

Continuous noise monitoring was carried out from 1100hrs on Thursday, 04 January 2024 to 1100hrs on Friday, 05 January 2024 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.

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

Table 4.1 – Continuous Monitoring Location Details

Position	Description
A	On railings adjacent to entrance on east side of building
B	On fence to west side of building

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

4.2 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 mostly dry with an occasional breeze.

There were periods of light rain fall during the evening of the monitoring with a shower during the early hours of the morning.

4.3 Measurement Equipment

The following measurement equipment was used during the surveys:

Table 4.2 – Noise Monitoring Equipment List

Make	Description	Model	Serial Number	Last Calibrated	Certificate No.
NTi	Type 1 - Sound Level Meter	XL2-TA	A2A-10021-E0	15 August 2023	UK-23-094
	Preamplifier	MA220	5435	15 August 2023	UK-23-094
	Microphone Capsule	MC230	8547	15 August 2023	UK-23-094
NTi	Type 1 - Sound Level Meter	XL2-TA	A2A-14577-E0	23 June 2022	UK - 22 -051
	Preamplifier	MA220	7485	23 June 2022	UK - 22 -051
	Microphone Capsule	MC230	A15594	23 June 2022	UK - 22 -051
Rion	Calibrator (94.03dB @ 984Hz)	NC-73	10355197	31 May 2023	UCRT23/1729

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.

4.4 Results

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

Period	Position	
	A	B
Daytime $L_{Aeq,16hr}$ (dB)	57	59
Night-time $L_{Aeq,8hr}$ (dB)	51	54

The following hourly $L_{Aeq,1hr}$ noise levels were measured during the period between 0700hrs and 2300hrs;

Table 4.4 – Summary of $L_{Aeq,1hr}$ results for proposed opening hours (0700-2300hrs)

Period	Position	
	A	B
0700-0800hrs	57	58
0800-0900hrs	58	59
0900-1000hrs	58	60
1000-1100hrs	59	60
1100-1200hrs	57	59
1200-1300hrs	57	58
1300-1400hrs	57	58
1400-1500hrs	58	58
1500-1600hrs	58	60
1600-1700hrs	59	60
1700-1800hrs	58	59
1800-1900hrs	57	59
1900-2000hrs	56	57
2000-2100hrs	56	61
2100-2200hrs	55	56
2200-2300hrs	53	55

The following $L_{Aeq,15min}$ noise levels were measured during the period between 0600-0700hrs;

Table 4.5 – Summary of $L_{Aeq,15min}$ results for proposed opening hours (0600-0700hrs)

Period	Position	
	A	B
0600-0615hrs	54	56
0615-0630hrs	56	57
0630-0645hrs	56	57
0645-0700hrs	58	58

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

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

Table 4.6 – Minimum Consistent Daytime and Night-time Background L_{A90} Results

Period	Position	
	A	B
Daytime (0700-2300hrs) L_{A90} (dB)	50	54
Night-time (2300-0700hrs) L_{A90} (dB)	48	54

During the daytime period, background noise levels were controlled by traffic on Bridge Street.

During the night-time period, background noise levels were controlled primarily by the Ebbw River with some intermittent traffic on Bridge Street.

5. CAR PARK ASSESSMENT

5.1 Methodology

Assessment methodology is based on Design Manual for Roads and Bridges (DMRB) set out in Section 2.5.

The proposed daytime assessment period is 1-hour and the night-time/early morning assessment period is 15 minutes.

5.2 Flows

The transport consultant for the scheme has predicted the expected peak hourly flow rates of vehicles arriving at the proposed development are shown in Table 5.1 below:

Table 5.1 – Vehicle Flow rates

Period	Two-Way Vehicle flows
Weekday peak 0600-0700hrs*	28
Weekday peak 1700-1800hrs	42
Saturday peak 1200-1300hrs	48

**No data is included for the period 0600-0700 on the transport statement, we have therefore used the period 0700-0800, which equates to 7no two-way vehicle flows over a 15minute period.*

We have therefore based our model on 48no two-way vehicle movements during the daytime and 7no two-way movements night-time period respectively as a worst-case basis.

5.3 Car Parking Event Source Data

The following spectra measured at 5m have been used in our assessment:

Table 5.2 - Car Parking Activities- Source Spectra @5m

Activity	Period	$L_{Aeq,T}$	L_{feq} Octave Band Centre Frequencies (dB)							
		dB	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
Car Start & Pull off	10s	63	65.9	57.6	55.5	58.3	57	58.2	52.5	49.1
Car Stop	13s	62.8	74.1	65.5	57.2	58.7	58.7	55	52.2	47.5
Car Pass-by	2s	64	74.4	69.6	59.3	60.2	61.2	57.9	56.2	52.4
Car Door Shut*	0.5s	81	71.5	74	69.5	76.1	76.6	75.3	69.9	64.2

*$L_{max,F}$ values

These source figures have been used to set up a noise map predicting car park events SSRs.

2.5 Noise Modelling Parameters

The above source data has been used to set up a noise model predicting car park noise to neighbouring SSRs. The model is based on 48no cars arriving/leaving during an hour period during the daytime (0700-2300hrs) and 7no cars arriving/leaving during a 15minute period during the night-time (0600-0700hrs).

Noise models in Appendix C show predicted levels for the car park arrivals and departures.

5.5 Assessment

The results of the car park noise impact are shown in Table 5.3 below.

The noise model contours are shown in Figure C.1 and Figure C.2 of Appendix C

Table 5.3 - Comparison of Car Park Noise with Existing Traffic Noise

SSR	Period	Typical Existing L_{Aeq} (dB)	Peak Predicted Car Park Noise L_{Aeq} (dB)	Change in Noise Level L_{Aeq} (dB)	DMRB Significance
1	Daytime	58	39	0.1	Negligible
	Night-time	57	39	0.1	Negligible
2	Daytime	57	51	1.0	Minor Adverse
	Night-time	56	50	1.0	Minor Adverse
3	Daytime	57	54	1.8	Minor Adverse
	Night-time	56	54	2.1	Minor Adverse

A minor adverse impact is indicated at SSR2 & SSR3, a negligible impact is indicated at SSR1.

This is not assessed unreasonable bearing in mind the context of the site along with these predicted values being peak hours.

Overall therefore, the impact of car park noise at the SSRs is considered insignificant.

6. DELIVERY NOISE IMPACT ASSESSMENT

6.1 Proposed Operations

Delivery vehicles have the potential to deliver between the periods 0700-2300hrs (daytime hours only). Our model has allowed for up to 1no delivery to occur within the same hour period.

The delivery vehicle is to be located to the south of the building and is to be present for approximately 11minutes in accordance with the measured duration as discussed in section 6.2.

Measured background sound levels during the periods the delivery vehicles have potential to deliver between are summarised in Table 6.1 below.

Table 6.1 – Minimum Consistent Daytime Background L_{A90} Results

Period	Position	
	A	B
Daytime (0700-2300hrs) L_{A90} (dB)	50	54

6.2 Source Noise Data

The following Hunter Acoustics Database figures have been used for HGV reversing and starting/pulling off at a similar site.

We understand a 18T HGV vehicle is proposed to be used to deliver goods to the store.

For source noise levels of delivery activity, Hunter Acoustics Database figures have been used in our assessment.

Table 6.2 – HGV Database Figures

Activity	Distance from source (m)	Duration (mm:ss)	L_{Aeq} (dB)	$L_{Amax,F}$ (dB)
HGV Reversing (broadband alarm)	10	00:10	67	71
HGV Start and Pull-off	10	00:20	69	76
Deliveries (Unloading goods from HGV on trolleys/cages)	4	11:00	71	90*

*L_{max} levels from roll-cages and HGV doors/latches being shut.

Octave band data is to be used in the model is included Table C.1 and Table C.2 in Appendix B.

Additional noise generating activity has been sourced using noise mapping software Softnoise's Predictor V2023rev1 data library, detailed in Table C.1.

6.3 Noise Model Analysis

Our analysis has used the proprietary Predictor (v2021.1) computer modelling software, in conjunction with procedures of ISO 9613.

This model allows noise levels from noise sources (including building facades) to be predicted over large distances and varying terrain. Attenuation is included accounting for distance, air absorption, ground absorption and screening losses from site topography/local structures.

Standard LiDAR DTM 1m data has been used for terrain modelling. The existing barrier to the west of site has been included in our model.

The analysis predicts resultant noise levels at the SSRs.

Drawings used in our assessment are referenced in Appendix E.

6.4 Noise Model Results

Based on the scenario detailed in section 6.2 above, predicted levels at critical receiver locations are shown in Table 6.3 below;

Table 6.3 –Noise Model Predictions

Sound Sensitive Receiver (SSR)	Level Above Ground	Predicted Daytime $L_{Aeq,1hr}$ (dB)
SSR1	1.5m	42
	4.5m	43
SSR2	1.5m	53
	4.5m	53
SSR3	1.5m	51
	4.5m	50

The noise map model in Figure C.3 shows the predicted daytime noise contour plots across the surrounding area to critical SSRs at 1.5m above local ground height.

6.5 Acoustic Character Correction

Impulsive noise from trolleys/cages and HGV doors/latches during the daytime is indicated to be up to 71dB$L_{AMax,F}$ compared with existing daytime (0700-2300) traffic noise climate of 77-80dB $L_{Amax,F}$ at nearest receivers.

A 3dB penalty has been applied for 'just perceptible' impulsive content during the daytime at SSR1 & SSR2.

No characteristics are expected during the daytime at SSR1.

6.6 BS 4142:2014+A1:2019 Assessments

BS 4142 assessments for the daytime time deliveries at all residential SSRs are included in Table D.1, Table D.2 and Table D.3 in Appendix D.

Results of these are summarised in Table 6.4 below;

Table 6.4 – Predicted Daytime Rating Levels at SSRs

Sound Sensitive Receiver (SSR)	Predicted Rating Noise Level $L_{Ar,Tr}$ (dB)	Background Sound Level $L_{A90,T}$ (dB)	Excess of Rating over Background
SSR1	43	54	-11
SSR2	56	50	+6
SSR3	54	50	+4

Excesses during the daytime period of +6dB are therefore likely to be an indication of an adverse impact, depending on the context.

Context is discussed in 6.7 below.

6.7 Context

Referring to Section 11 of BS4142 (quoted in 2.3 of this report) the following section outlines the context:

6.7.1 Absolute Sound Levels

BS4142 advises: "*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.*"

Background sound levels during the operational hours of the proposed site are not considered to be low.

Comparing the predicted absolute levels to the ambient noise levels detailed in Table 4.4 and Table 4.5, the delivery event is in line with the ambient noise level during the daytime period. Due to this, a significant adverse impact is considered to be less likely to occur.

Outcome: Modification of impact due to existing ambient noise levels against predicted absolute levels. Outcome modified to indication of adverse impact less likely.

6.7.2 Character of Specific Sound Level

BS4142 advises: "*Consider whether it would be beneficial to compare the frequency spectrum and temporal variation of the specific sound with that of the ambient or residual sound to assess the degree to which the specific sound source is likely to be distinguishable and will represent an incongruous sound by comparison to the acoustic environment that would occur in the absence of the specific sound."*

It is expected that delivery activity would contain impulsive characteristics at source – such as the delivery vehicle unloading goods and the roll cages rattling when being pushed between the vehicle and the store.

A 3dB penalty has been applied at SSR2 & SSR3 based on predicted absolute levels against existing ambient noise levels during those time periods.

Outcome: No modification required. Indication of adverse impact remains less likely to occur.

6.7.3 Frequency of Deliveries

Measured delivery durations comprise of approximately 11minutes, this is not considered a significant amount of time to cause repeated adverse impact to nearby residential receivers.

Outcome: Modification of impact due to short activity period. Indication of adverse impact remains less likely to occur.

6.7.4 Character of Location

The proposed location of the store is amongst a mixture of commercial and residential dwellings, audio analysis of the survey picked up on intermittent and tonal characteristics from the adjacent workshop.

Ambient noise generated by the delivery activity will comprise of the vehicle entering the site, loading the goods, then exiting the site. Ambient noise levels of the delivery vehicle moving across the site are expected to be within the same soundscape as the local environment. **This is based on the assumption the delivery vehicle does not contain tonal reversing alarms and that a broadband reversing alarm is used by all delivery vehicles for the site.**

Outcome: No modification required. Indication of adverse impact remains less likely to occur.

6.7.5 Summary

Based on the context set out above, it is considered an adverse impact is indicated less likely at SSR2 & SSR3.

Delivery noise impact at SSR1 is indicated to be a low.

7. BUILDING SERVICES ENVIRONMENTAL NOISE IMPACT

As discussed in Section 2.6, the Local Planning Authority's environmental health department have not set numerical values for rating level against background on the scheme.

We would therefore advise aiming for a low impact when assessed in accordance with BS 4142 at this stage.

Rating level as determined in accordance with BS 4142 should not therefore exceed background sound levels as a minimum. We have set initial limits below which equate to rating levels 5dB below background.

It is understood 1no condenser and 4no AC units are to be located in an external compound enclosed towards the north-east of site. The AC units are to run 0600-2300 only, the refrigeration plant is to run constantly day and night. Condensing plant is to run during daytime and night-time periods.

Plant selection and design has not been finalised at this time. We have therefore used a total plant limiting level in the model for all future plant to be selected against.

Table 7.1 – Operational Noise Limits at Nearest Receptors

Period	Position	
	SSR1	SSR2 & SSR3
Daytime (0700-2300hrs) $L_{Ar,1hr}$ (dB)	45	49
Night-time (2300-0700hrs) $L_{Ar,15min}$ (dB)	43	48

Note: $L_{Ar,Tr}$ to be determined in accordance with British Standard 4142:2014+A1:2019.

The above proposed limits should be agreed acceptable with the Local Planning Authority's Environmental Health department.

The above limiting plant rating noise levels have been set 5dB below the measured night-time background sound level, to allow for possible cumulative noise impact from deliveries.

This should ensure a 'low' impact is achieved for mechanical plant, referring to BS4142:2014+A1:2019, in accordance with local planning comments as discussed in section 2.6. This should also mean that absolute L_{Aeq} noise levels are not increased.

8. CONCLUSION

A noise impact assessment has been carried out for the proposed convenience store at Bridge Terrace, Newbridge, NP11 5FH.

An environmental noise survey has been carried out the determine the existing ambient and background noise levels at the nearest noise sensitive premises.

Noise associated with the proposed use is to consist of activity from vehicles accessing the car park and drive-thru, deliveries and external refrigeration plant.

8.1 Car Park

Predicted noise levels at the nearest SSRs from daytime and night-time peak car movements on the site are indicated to give a minor adverse impact at two SSRs, overall the impact of car park noise at the SSRs is considered insignificant.

2.3 Deliveries

Rating noise levels generated by the delivery vehicle activity are predicted to exceed the daytime background sound level by 4-6dB at SSRs. BS4142:2014 +A1:2019 advises an indication of adverse impact is likely, depending on context. Given the context detailed in section 6.7, we suggest an adverse impact is less likely for daytime deliveries.

2.3 Fixed Plant

Environmental noise limits for fixed services plant at the nearest noise sensitive premises have been set 5dB below the measured night-time background sound level, to allow for possible cumulative noise impact from deliveries.

This should ensure a ‘low’ impact is achieved, referring to BS4142:2014+A1:2019.

APPENDIX A - ACOUSTIC TERMINOLOGY

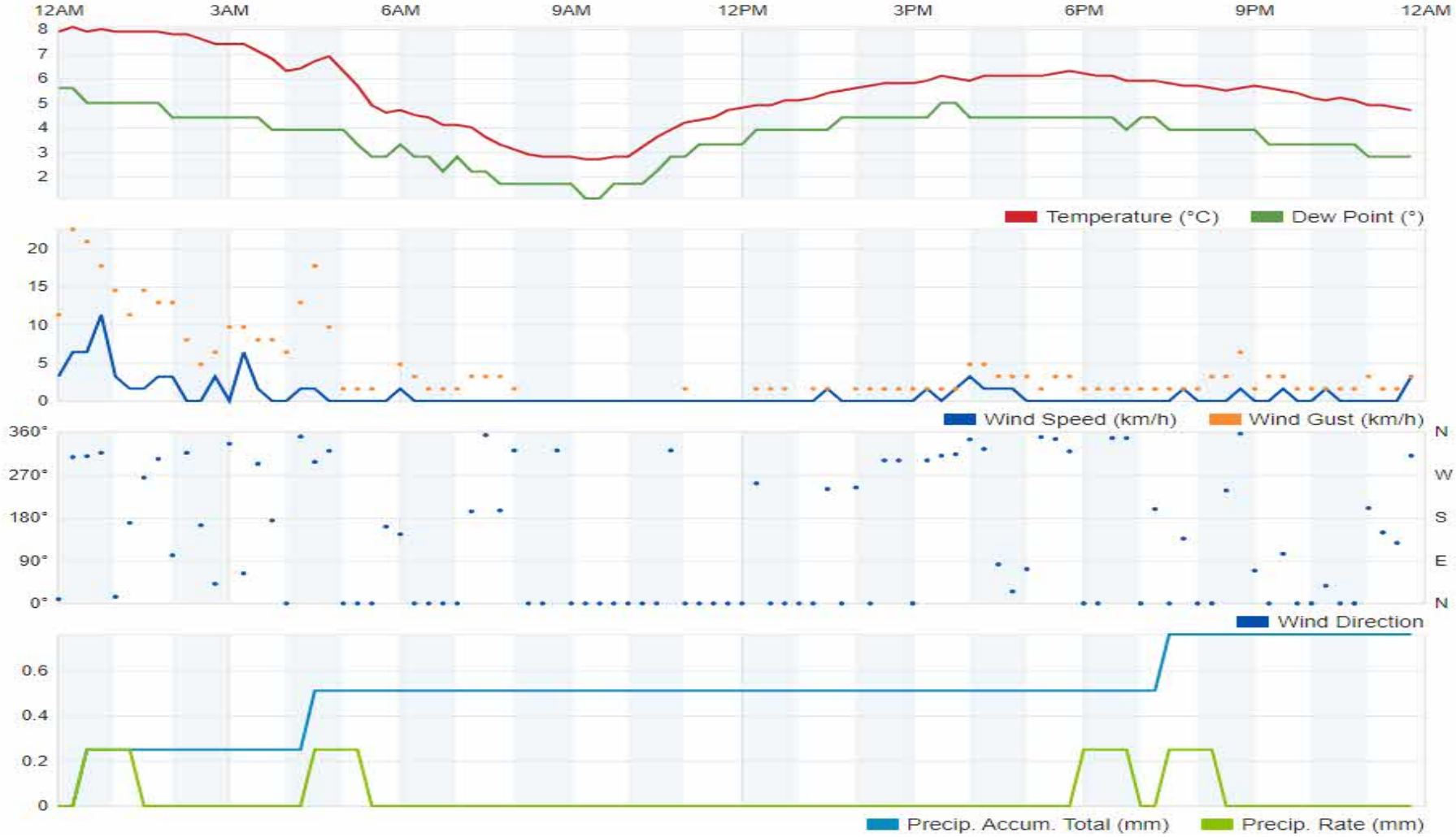
Human response to noise depends on a number of factors including loudness, frequency content and variations in level with time. Various frequency weightings and statistical indices have been developed in order to objectively quantify 'annoyance'.

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).

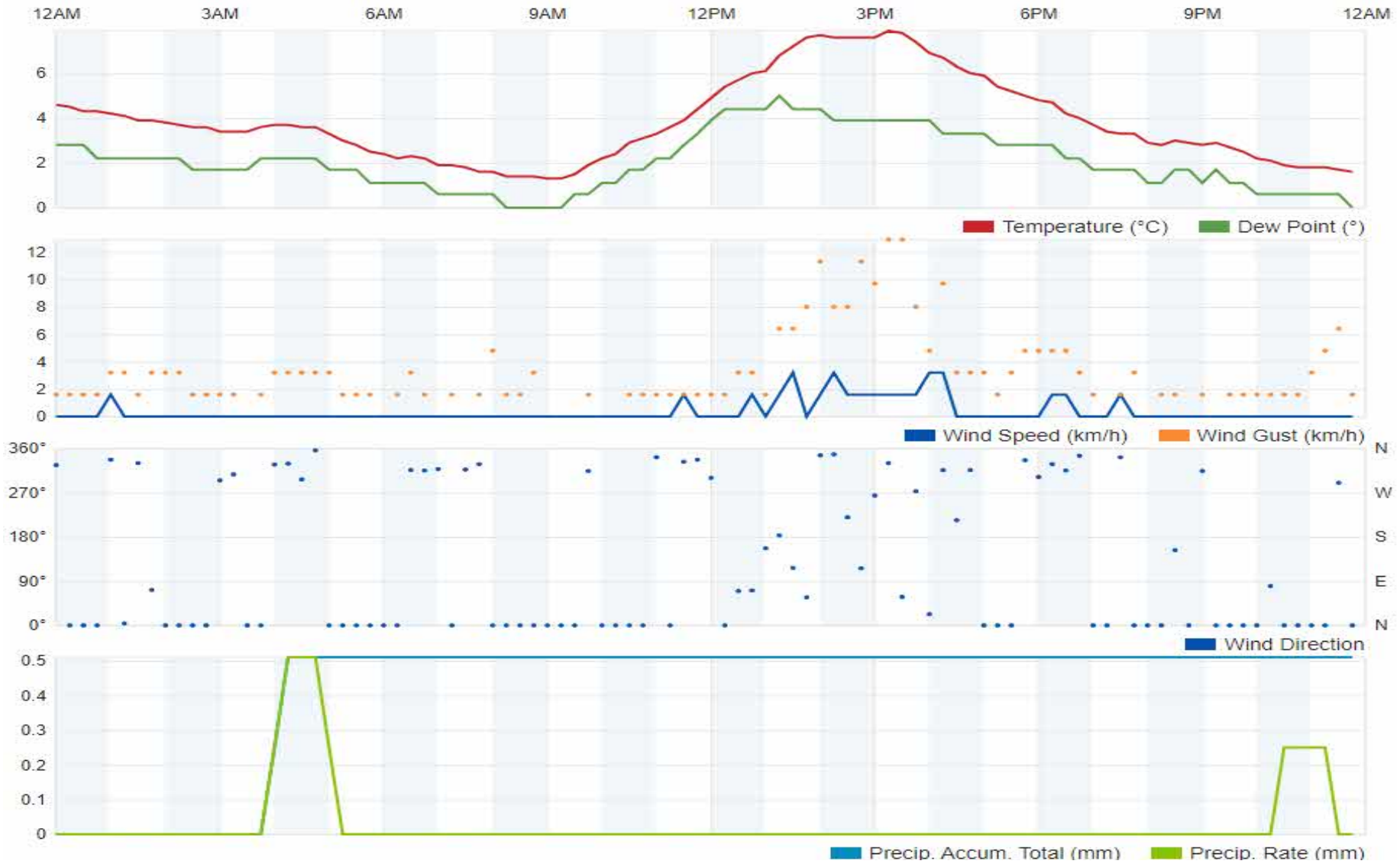
APPENDIX B - DIAGRAMS, GRAPHS AND TABLES

Figure B.1 – Approximate Weather History for Thursday, 04 January 2024



Note: Taken from www.wunderground.com - weather station INEWPO74 located in Cwmcarn [Elev 58 m, 51.64 °N, 3.13 °W]

Figure B.2 – Approximate Weather History for Friday, 05 January 2024



Note: Taken from www.wunderground.com - weather station INEWPO74 located in Cwmcarn [Elev 58 m, 51.64 °N, 3.13 °W]

Figure B.3 – Time History at Position A (Thursday, 04 January 2024 to Friday, 05 January 2024)

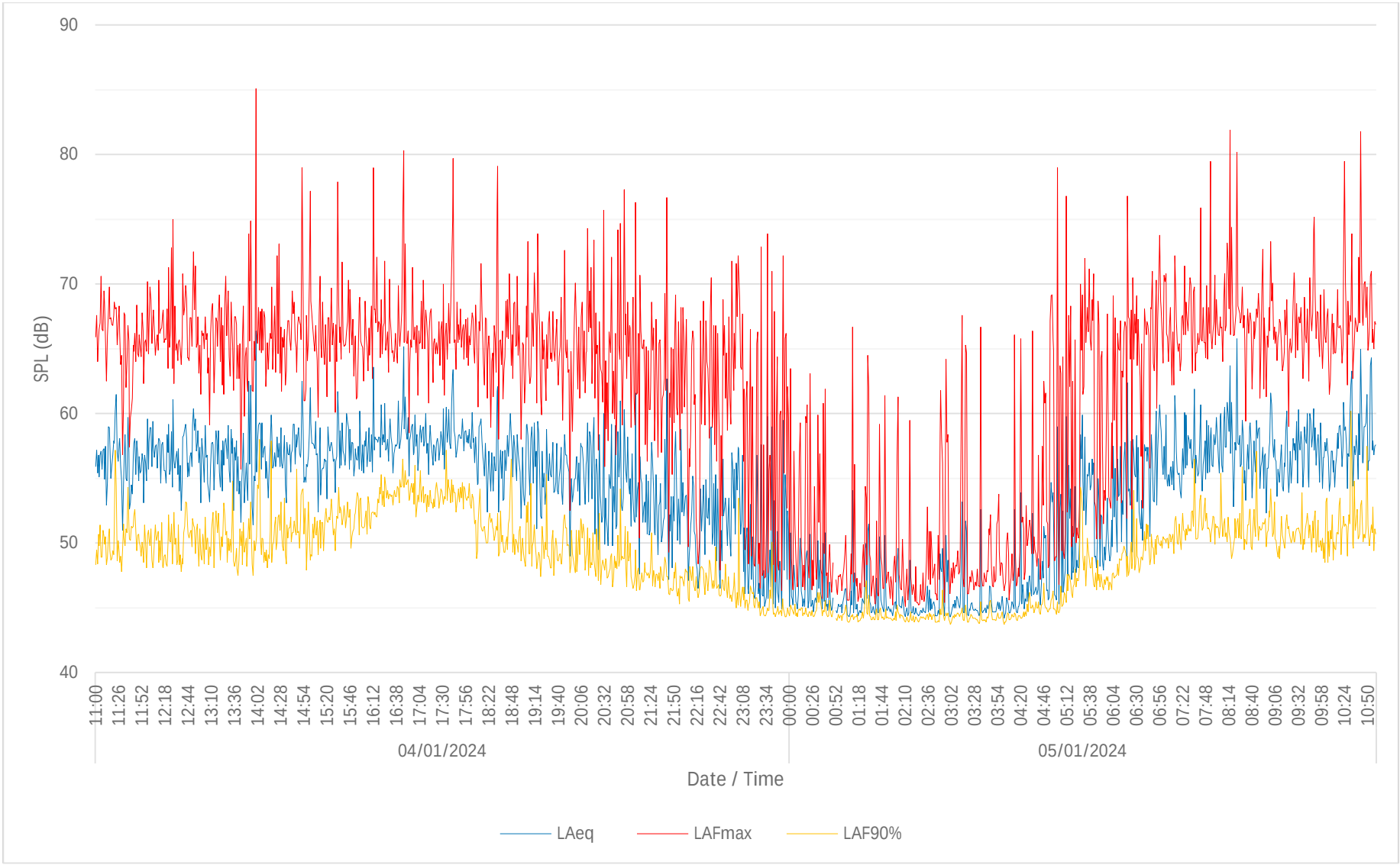


Figure B.4 – Time History at Position B (Thursday, 04 January 2024 to Friday, 05 January 2024)

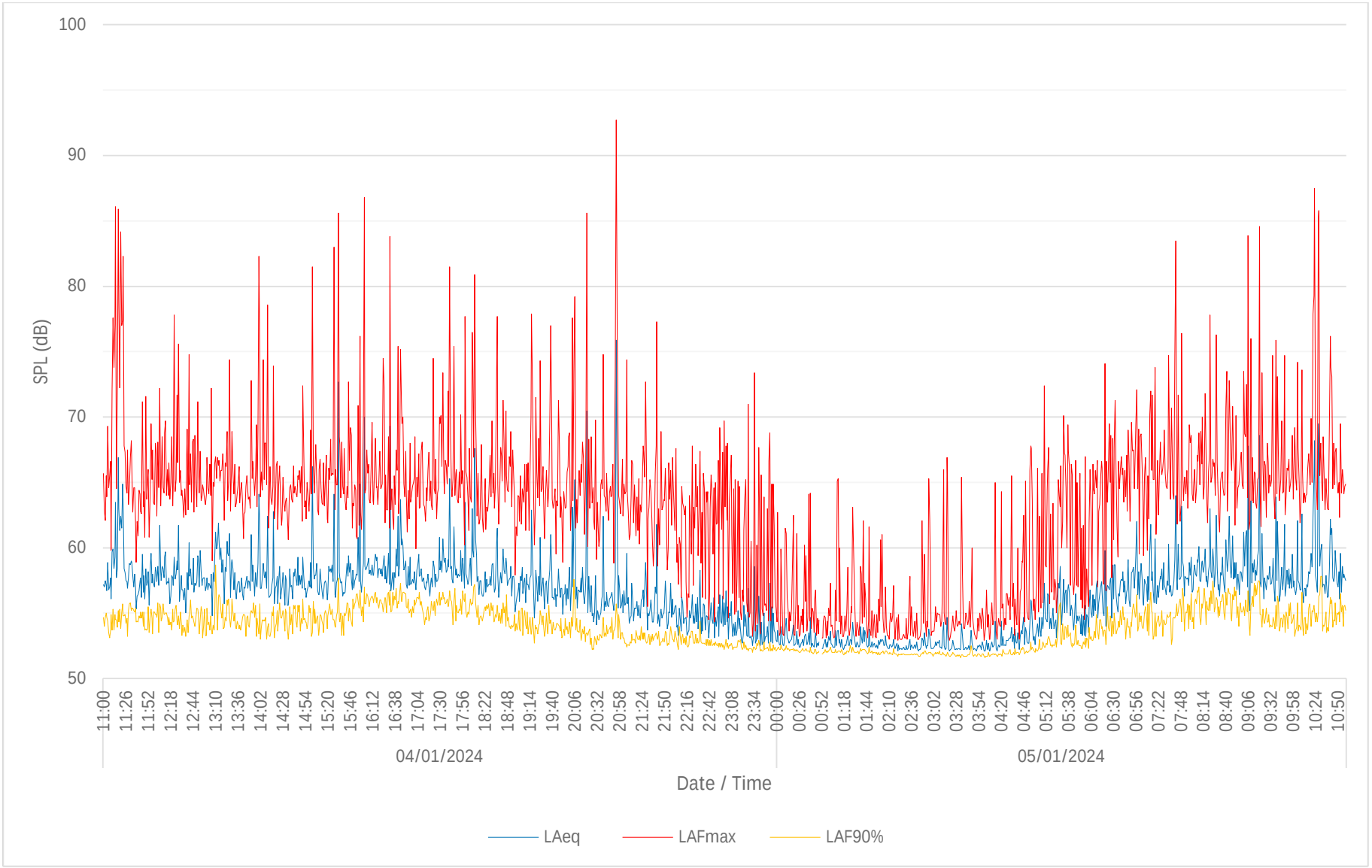


Figure B.5 – Statistical Analysis of Background Sound Levels Measured at Position A (Thursday, 04 January 2024 to Friday, 05 January 2024)

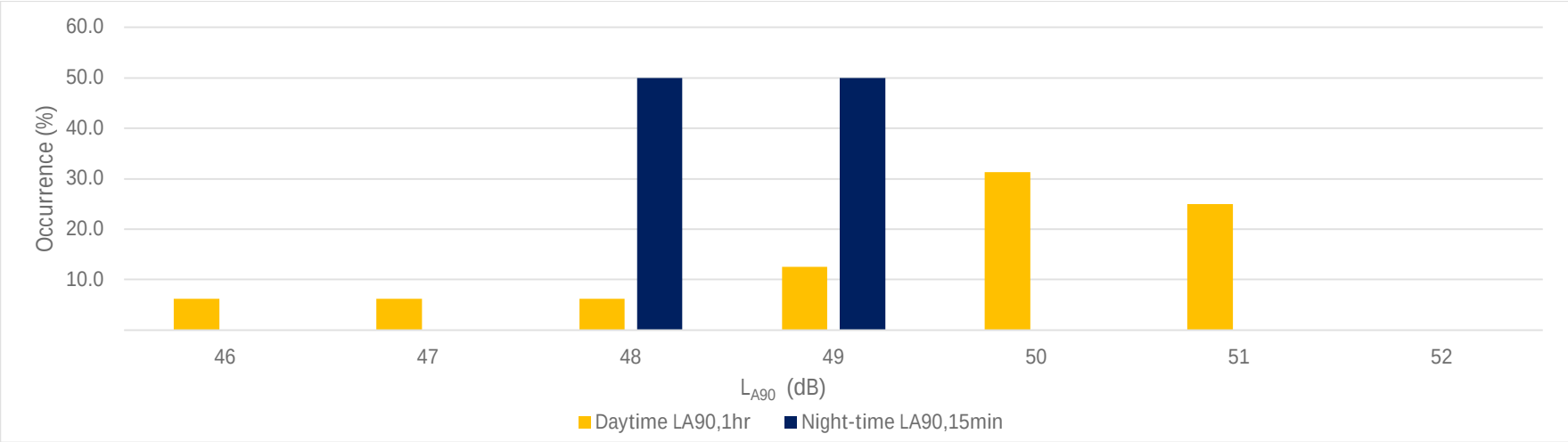
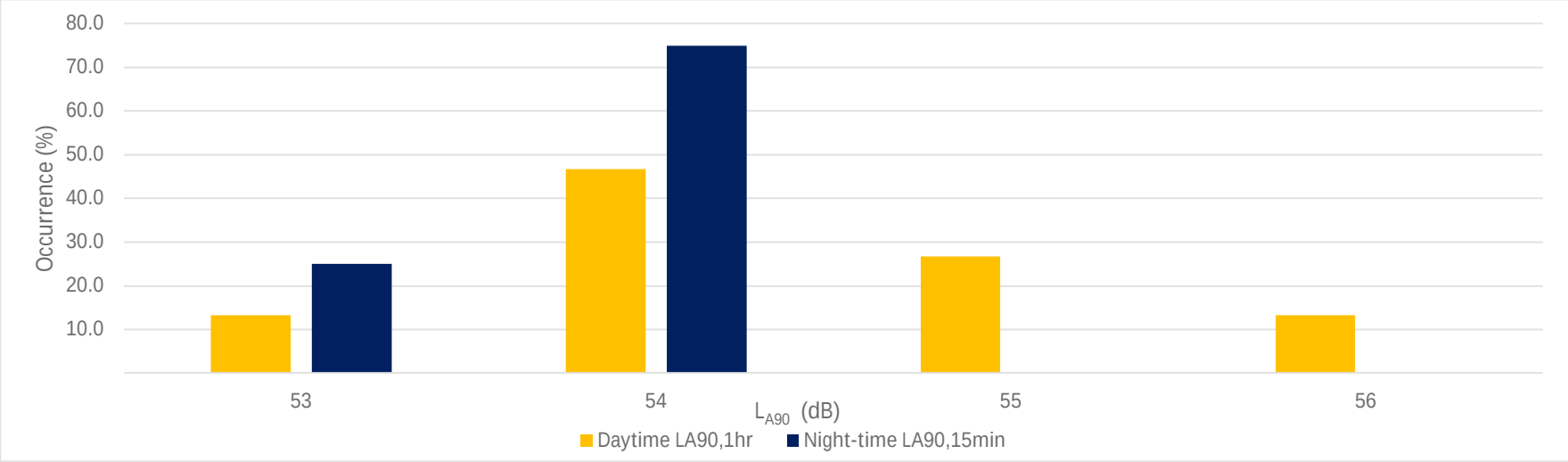


Figure B.6 – Statistical Analysis of Background Sound Levels Measured at Position B (Thursday, 04 January 2024 to Friday, 05 January 2024)



APPENDIX C - NOISE MAP MODELS

C.1 Noise Model Noise Contours

Figure C.1 – Daytime Car Park Noise Model at 1.5m above Local Ground Height (Worst-case $L_{Aeq,1hr}$)

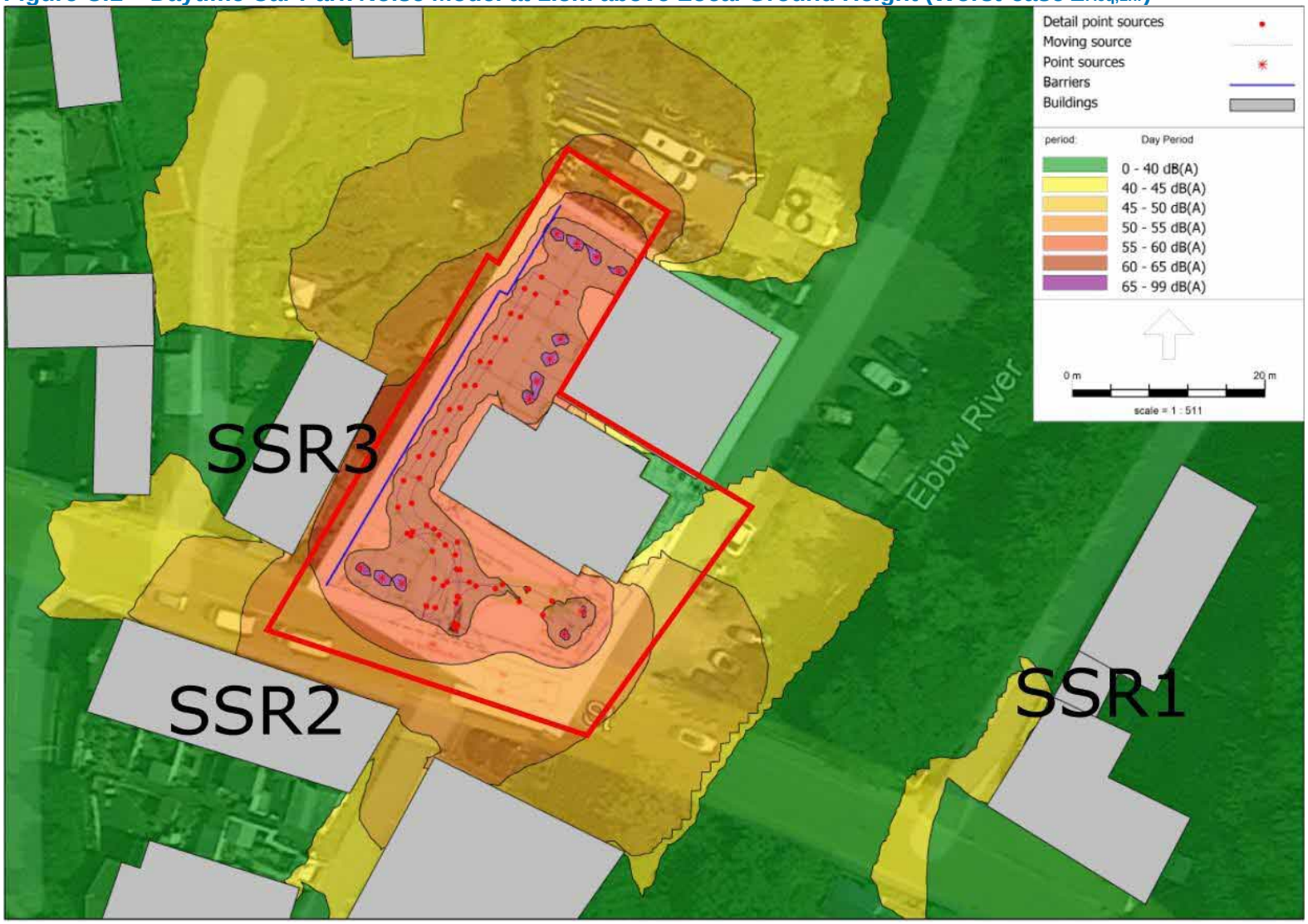


Figure C.2 – Night-time Car Park Noise Model at 1.5m above Local Ground Height (Worst-case $L_{Aeq,15min}$)

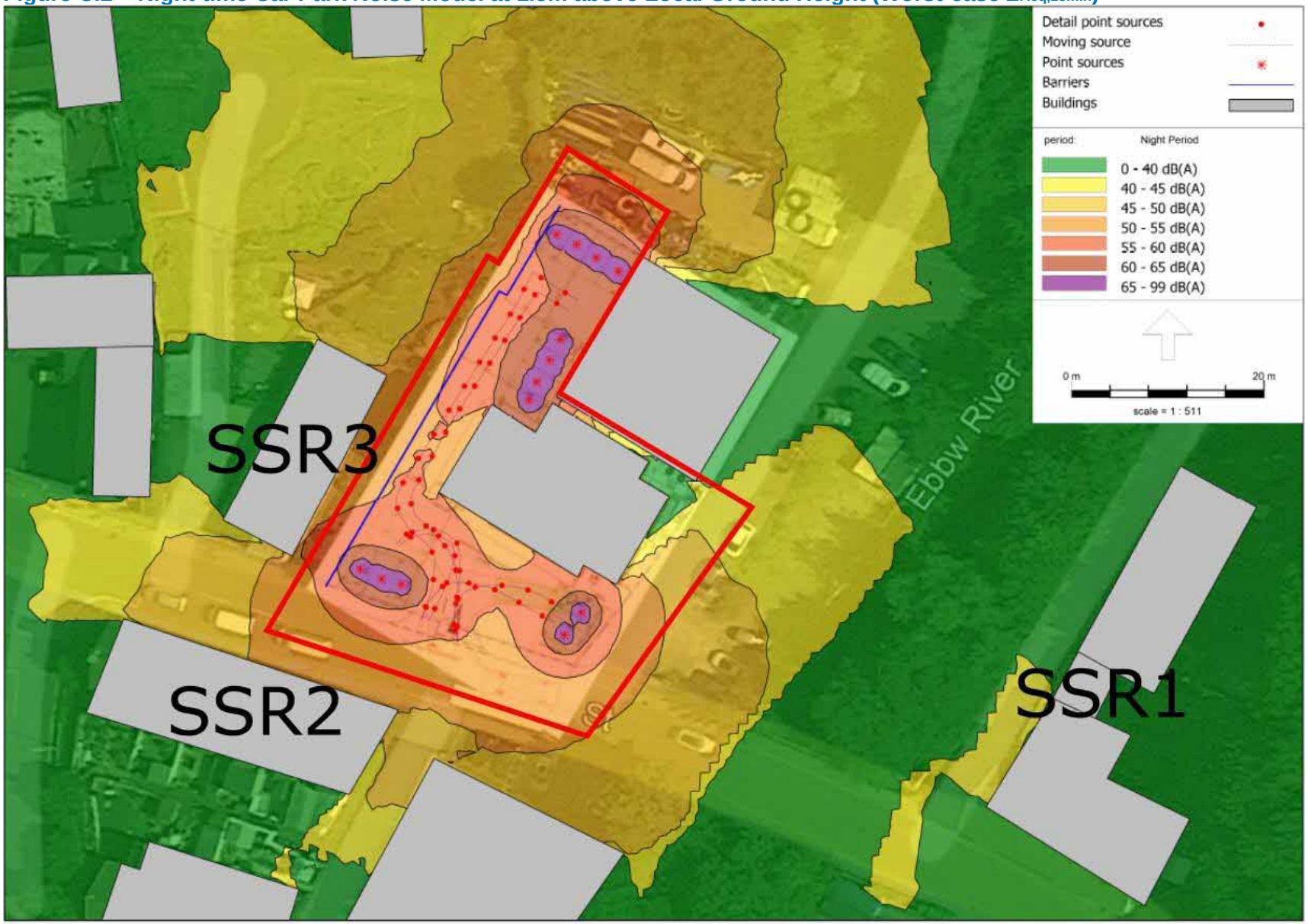
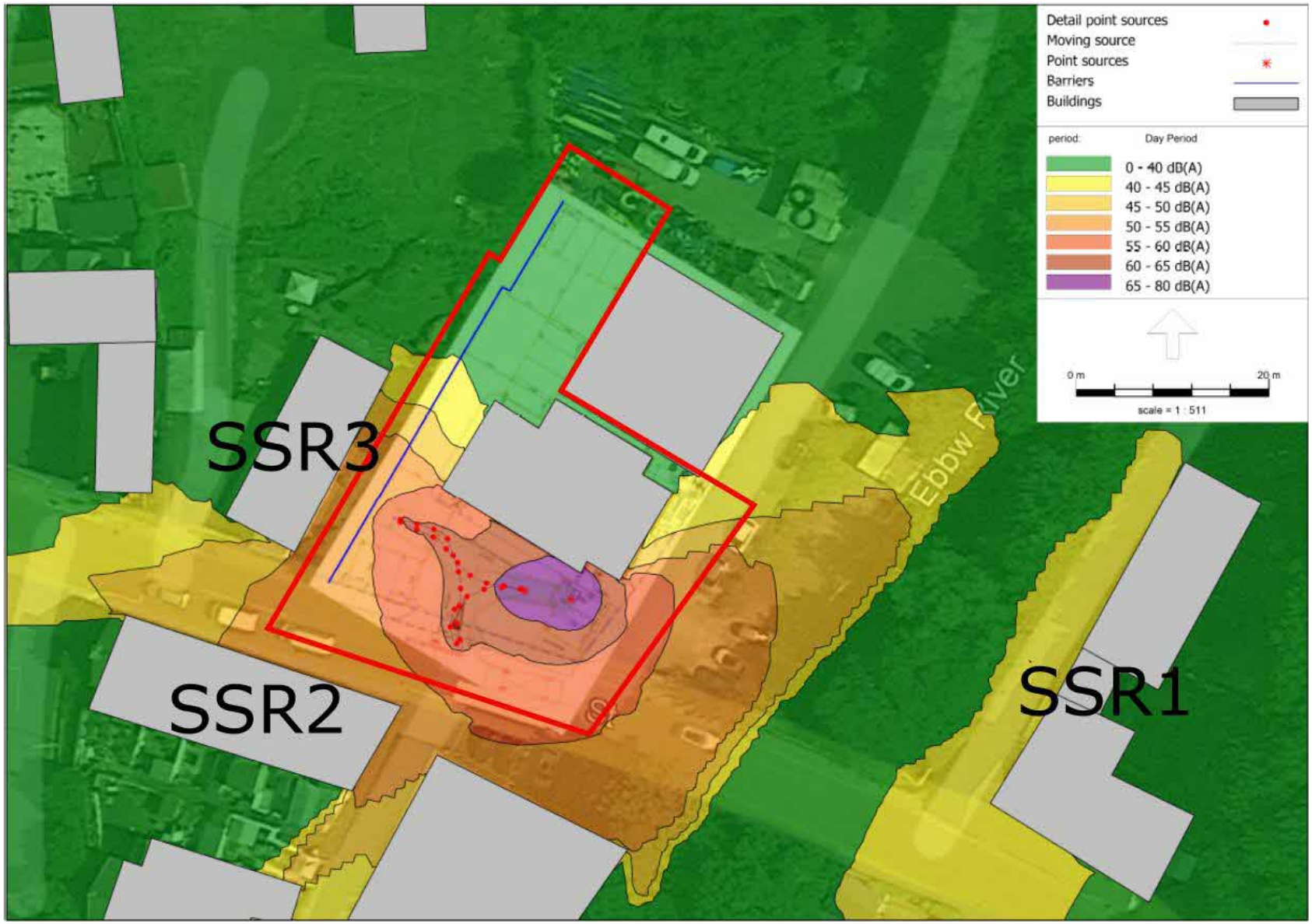


Figure C.3 – Daytime Delivery Noise Model at 1.5m above Local Ground Height ($L_{Aeq,1hr}$)



C.2 Noise Model Input Data

Table C.1 – Mobile Plant Noise Sound Power Data Used in Model

Plant Item / Activity	L_w at Octave Band Centre Frequencies, Hz (dB)								L_w
	63	125	250	500	1000	2000	4000	8000	(dB)
Truck Reversing Broadband Alarm	91	85	88	90	91	88	82	76	101

Table C.2 – Fixed Plant Noise Data Used in Model

Plant Item / Activity	L_w at Octave Band Centre Frequencies, Hz (dB)								L_{wA}
	63	125	250	500	1000	2000	4000	8000	(dB)
Delivery of Goods	96	93	89	89	85	82	77	71	91

Table C.3 – Source Plant Noise Data (Octave Band)

Description	Duration	Distance	L_{Aeq}	L_{eq} at Octave Band Centre Frequencies, Hz (dB)							
	(secs)	(m)	(dB)	63	125	250	500	1000	2000	4000	8000
HGV Reversing	10	10	67	63	57	60	62	63	60	55	48
HGV Start-up / Pull-off	20	10	69	68	66	67	66	64	61	54	43

C.3 Noise Model 3D Views

Figure C.4 – 3D Model of Proposed Site – Delivery Operations

Figure C.5 – 3D Model of Proposed Site – Car Parking Operations

APPENDIX D – BS 4142:2014+A1:2019 ASSESSMENTS

Table D.1 – Daytime Delivery BS 4142 Assessment at SSR1

Results		Relevant Clause	Commentary
Calculated Level of Daytime Activity at Position SSR1	L_{Aeq} = 43dB	7.3.2	Calculated using noise mapping software to SSR1 dwellings
Background sound level (daytime)	$L_{A90(0700\text{-}2300hrs)}$ = 54dB	8.1.1 8.1.3 8.3	Background sound level measured at Position B
Acoustic feature correction	+/-0dB	9.2	No acoustic features expected (see 6.5)
Excess of rating over background sound level	(43 - 54) dB = -11dB	11	
Assessment indicates low impact is likely, depending on the context		11	At 11dB below the background noise level, BS 4142:2014 advises a low impact is likely, depending on the context". Context is discussed in section 6.7.
Uncertainty of assessment		10	Uncertainty in background noise measurements is considered low.

Table D.2 – Daytime Delivery BS 4142 Assessment at SSR2

Results		Relevant Clause	Commentary
Calculated Level of Daytime Activity at Position SSR2	L_{Aeq} = 53dB	7.3.2	Calculated using noise mapping software to SSR2 dwellings
Background sound level (daytime)	$L_{A90(0700\text{-}2300hrs)}$ = 50dB	8.1.1 8.1.3 8.3	Background sound level measured at Position A
Acoustic feature correction	+3dB	9.2	Impulsive noise generated from delivery expected to be just perceptible (see 6.5)
Rating Level	(53 + 3) = 56dB		
Excess of rating over background sound level	(56 - 50) dB = +6dB	11	
Assessment indicates adverse impact less likely depending on context		11	At 6dB above the background noise level, BS 4142:2014 advises an adverse impact is likely, depending on the context". Context is discussed in section 6.7.
Uncertainty of assessment		10	Uncertainty in background noise measurements is considered low.

Table D.3 – Daytime Delivery BS 4142 Assessment at SSR3

Results		Relevant Clause	Commentary
Calculated Level of Daytime Activity at Position SSR3	L_{Aeq} = 51dB	7.3.2	Calculated using noise mapping software to SSR3 dwellings
Background sound level (daytime)	$L_{A90(0700\text{-}2300hrs)}$ = 50dB	8.1.1 8.1.3 8.3	Background sound level measured at Position A
Acoustic feature correction	+3dB	9.2	Impulsive noise generated from delivery expected to be just perceptible (see 6.5)
Rating Level	(51 + 3) = 54dB		
Excess of rating over background sound level	(54 - 50) dB = +4dB	11	
Assessment indicates adverse impact likely depending on context		11	At 4dB above the background noise level, BS 4142:2014 advises an adverse impact is likely, depending on the context". Context is discussed in section 6.7.
Uncertainty of assessment		10	Uncertainty in background noise measurements is considered low.

APPENDIX E - DRAWING LISTS

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

Table E.1 – Drawing List

Drawing Title	Drawing Number	Date
Site Location Plan	235027-IDL-01-ZZ-DR-A-P1001-S3-P01	15/09/23
Existing Site Layout Plan	235027-IDL-01-ZZ-DR-A-E2002-S3-P01	15/09/23
Proposed Site Layout Plan	235027-IDL-01-ZZ-DR-A-P2026-S3-P02	09/10/23
PROPOSED FEASIBILITY SITE PLAN	NEWBRIDGEFeaspg00	19 DEC 2023
PROPOSED FEASIBILITY RETAIL LAYOUT	NEWBRIDGEFeasgag00	19 DEC 2023