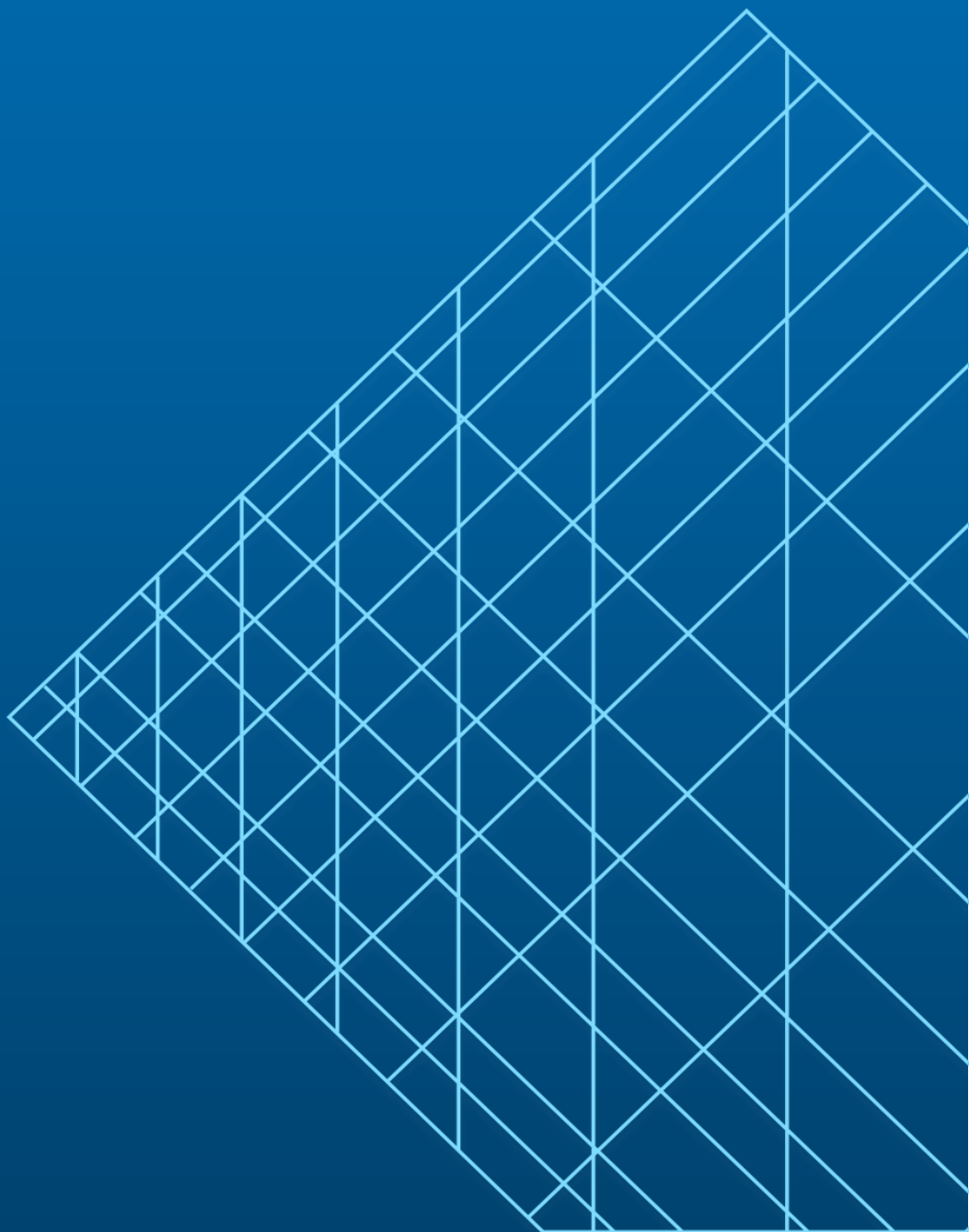
Hunter ACOUSTICS

Independent Acoustic Consultancy Practice

Noise Impact Assessment

Frontier Site
Pontllanfraith

7284/NIA1



Hunter ACOUSTICS

Independent Acoustic Consultancy Practice

Henstaff Court Business Centre
Llantrisant Road, Cardiff
CF72 8NG

t: +44(0)2920 891020

e: enquiries@hunteracoustics.co.uk

w: www.hunteracoustics.co.uk

Noise Impact Assessment

Project:	**Frontier Site**
Site Address:	Newbridge Road Industrial Estate Pontllanfraith NP12 2AN
HA Reference:	7284/NIA1
Date:	15/03/2024
Client:	Starburst c/o DPP LLP 11-13 Penhill Road Pontcanna Cardiff CF11 9PQ
Contact:	gary.sutton@dppukltd.com

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			Prepared by:	**Checked by:**
		Name	Paul McGrath BSc(Hons) MIOA	Meirion Townsend BSc(Hons) MIOA
		Signature		

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1. INTRODUCTION

We understand approximately 2,090m^2 of Class B1/B2/B8 commercial units is proposed at Frontier Site, Newbridge Road Industrial Estate, Pontllanfraith, NP12 2AN.

This report has therefore been commissioned to assess existing ambient and background noise levels at the closest sound sensitive receivers.

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

2. PLANNING GUIDANCE

2.1 Planning Policy Wales

The Welsh Government's Planning Policy Wales (Edition 10) dated December 2018, states the following:

"Location of Commercial, Industrial and other Potentially Polluting Development

6.7.15 For the purposes of this section, potentially polluting development includes commercial, industrial, energy and agricultural or transport infrastructure. Such development should be located in areas where there is low potential for public exposure, or where its impact can be minimised. Novel or new development types may potentially cause pollution and should be carefully considered, and where appropriate, decisions should be based on the precautionary principle.

6.7.16 Relevant considerations in making planning decisions for potentially polluting development are likely to include:

- *location, including the reasons for selecting the chosen site itself;*
- *impact on health and amenity;*
- *effect of pollution on the natural and built environment and the enjoyment of areas of landscape and historic and cultural value;*
- *impact on groundwater and surface water quality;*
- *effect on biodiversity and ecosystem resilience, including where there may be cumulative impacts on air or water quality which may have adverse consequences for biodiversity and ecosystem resilience;*
- *the risk and impact of potential pollution from the development, insofar as this might lead to the creation of, or worsen the situation in, an air quality management area, a noise action planning priority area or an area where there are sensitive receptors; and*
- *impact on the road and other transport networks, and in particular on traffic generation, particularly where the proposed development is not transport infrastructure itself.*

6.7.17 The location of potentially polluting development adjacent to sensitive receptors will be unacceptable where health and amenity impacts cannot be minimised through appropriate design and mitigation measures. It is the overall expectation that levels of pollution should be reduced as far as possible and for this reason the location of potentially polluting development should be taken into account as part of overall strategies in development plans to ensure it can be appropriately located and maximum environmental benefits can be gained through measures such as green infrastructure.#

2.2 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."

3. SOUND SENSITIVE RECEIVERS

Figure 3.1 below shows the development site and the closest existing SSRs.

Figure 3.1 – Site Plan Showing Nearest SSRs & Measurement Location

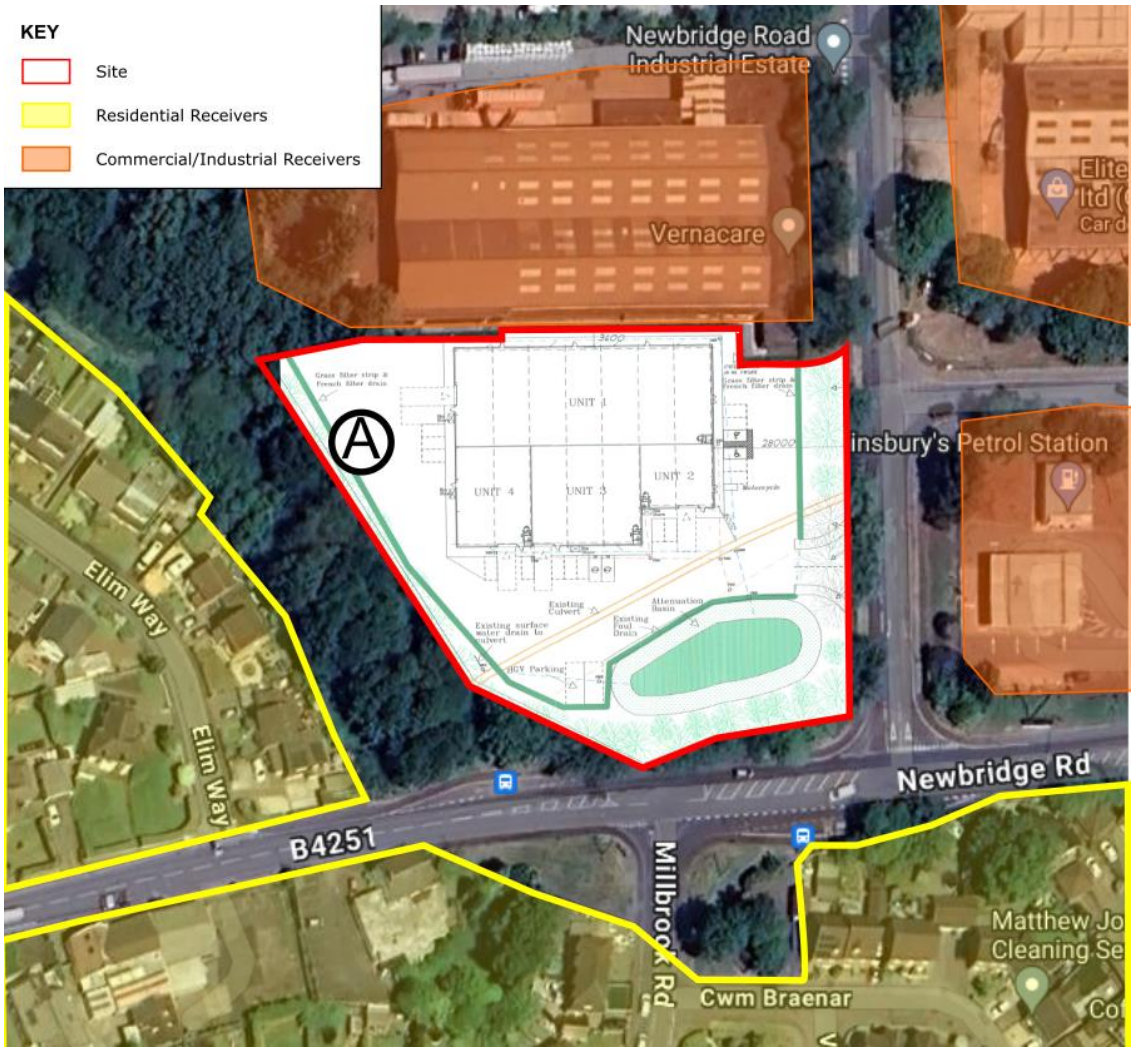


Table 3.1 – Nearest Sound Sensitive Receivers

Sound Sensitive Receiver (SSR) Description
Residential dwellings on Elim Way to the west of the site. Approx 50m from proposed Units.
Residential dwellings off Millbrook Rd to the South of the site. Approx 75m from proposed Units.

There are no other residential SSRs in the immediate vicinity of the site which is predominantly surrounded by existing industrial/commercial land uses to the north and east.

4. ENVIRONMENTAL NOISE SURVEY

4.1 Procedures

Continuous noise monitoring was carried out from 1115hrs on Wednesday, 06 March 2024 to 1055hrs on Thursday, 07 March 2024 at position A.

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.

Table 4.1 – Continuous Monitoring Location Details

Position	Description
A	Located in tree line on the western site boundary approximately 40m from the closest sound sensitive receivers and 75m from Newbridge Road

Note: All microphone positions approximately 1.8m 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 dry with an occasional breeze.

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-19813-E0	27 October 2023	UK-23-128
	Preamplifier	MA220	10302	27 October 2023	UK-23-128
	Microphone Capsule	MC230A	A21824	27 October 2023	UK-23-128
Larson Davis	Calibrator (94.00dB / 114.03dB @ 1kHz)	CAL200	19047	15 August 2023	45153-19047-CAL200

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

Tim History Graph in Figure B.3 of Appendix B show L_{Amax}, L_{Aeq} and L_{A90} sound pressure levels measured at position A.

4.4.1 Background Sound Levels

Figure B.4 of Appendix B show statistical analysis of background sound levels measured at positions A in accordance with BS4142:2014+A1:2019 methodology.

The following representative daytime and night-time background L_{A90} sound levels have been determined:

Table 4.3 – Minimum Consistent Daytime and Night-time Background L_{A90} Results

Period	Position
	A
Daytime (0700-2300hrs) $L_{A90,1hr}$ (dB)	52
Night-time (2300-0700hrs) $L_{A90,15min}$ (dB)	37

4.4.2 Ambient Sound Levels

The following $L_{Aeq,1hr}$ daytime (0700-1900hrs), $L_{Aeq,1hr}$ evening (1900-2300hrs) $L_{Aeq,15min}$ night-time (2300-0700hrs) ranges were measured:

Table 4.4 – Summary Ambient $L_{Aeq,T}$ Sound Levels

Period	Position
	A
Daytime $L_{Aeq,1hr}$ (dB)	54 - 57
Evening $L_{Aeq,1hr}$ (dB)	50 - 54
Night-time $L_{Aeq,15min}$ (dB)	38 - 55

The above figures would be used to set construction/demolition noise limits.

5. NOISE IMPACT ASSESSMENT

5.1 Proposed Uses

Class B2 General Industrial Use is defined as *"Use for industrial process other than one falling within class B1 (excluding incineration purposes, chemical treatment or landfill or hazardous waste)"* Class B8 Storage or Distribution is defined as "*Use for storage or as a distribution centre."* Class B1 is defined at *"Uses which can be carried out in a residential area without detriment to its amenity".*

By these definitions, Class B2 could therefore cover a range of industrial activities without any restrictions with respect to impact upon amenity, including noise. Similarly, Class B8 could cover a range of storage/distribution uses with no apparent restrictions on HGV movements.

However, whilst B2 could allow for any unrestricted industrial use, the proposed Units 1, 2, 3 & 4 are likely to comprise a mix of small light industrial and commercial business units similar to the current uses on the wider neighbouring Newbridge Road Industrial Estate area operating daytime hours only, rather than large heavy manufacturing operating 24/7.

It is therefore proposed to assess the noise impact by using the background sound levels to set limits for fixed plant, as well as assessing the likely impact of any goods vehicles during the day.

5.2 Fixed Plant Noise Limits

An assessment for fixed plant noise limits for the proposed units 1-4 has been carried out.

To allow an initial assessment, an overall external plant noise limit for each tenancy of Units 1, 2, 3 & 4 has been modelled as an example:

Table 5.1 – Fixed Plant Noise Limits (per Unit) measured at closest SSRs

Period	Plant Rating Noise dB $L_{Aeq,T}$ @SSRs
Daytime (0700-2300hrs)	40
Night-time (2300-0700hrs)	25

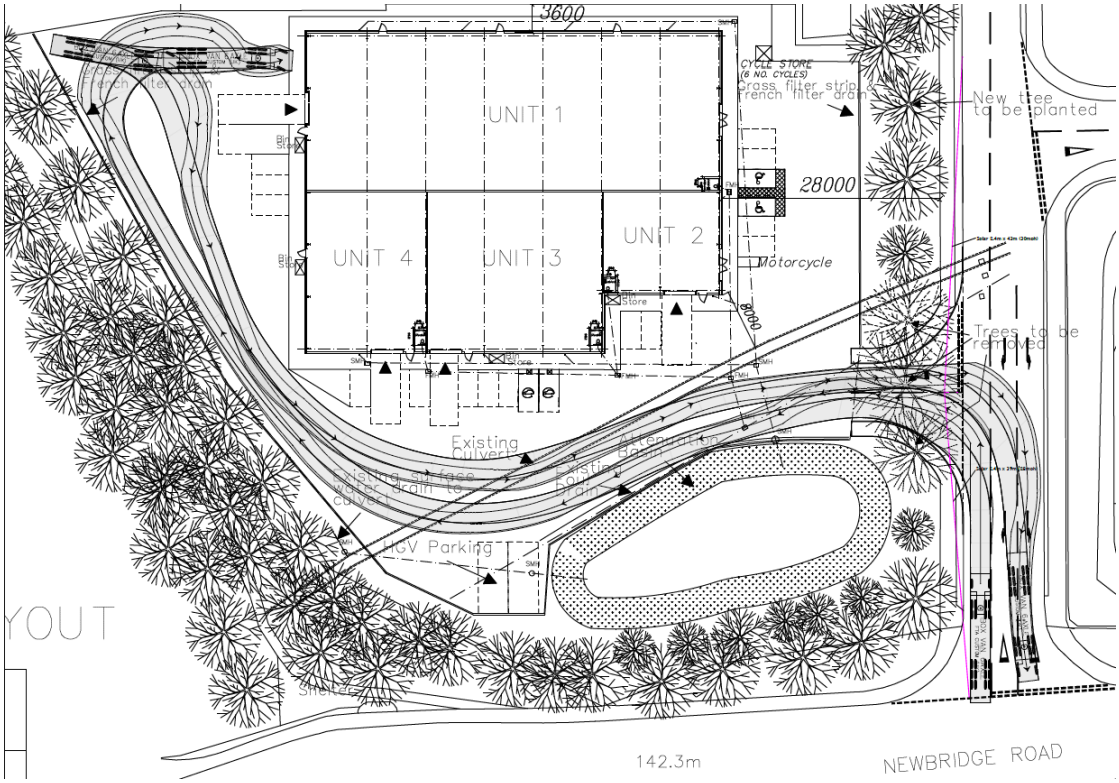
5.3 Vehicle Movements & Unloading/Loading

5.3.1 Vehicle Movements

It is understood that the HGV movements are to be limited to normal daytime hours and are unlikely to be regular, with majority of commercial vehicles accessing the site light goods vehicles.

We have therefore based an initial assessment 1no HGV arrival and departure within an hour period during the daytime. Figure 5.1 below shows the proposed HGV tracking layout:

Figure 5.1 - Proposed HGV (Artic) Tracking Layout



HGV noise levels are predicted to fall <50dB $L_{Aeq,1hr}$. This is indicated to be below the daytime background sound levels of 52dB $L_{A90,1hr}$ and well below the prevailing ambient road traffic noise levels. It could also be argued that vehicle movements on the site would fit within the existing daytime traffic noise soundscape.

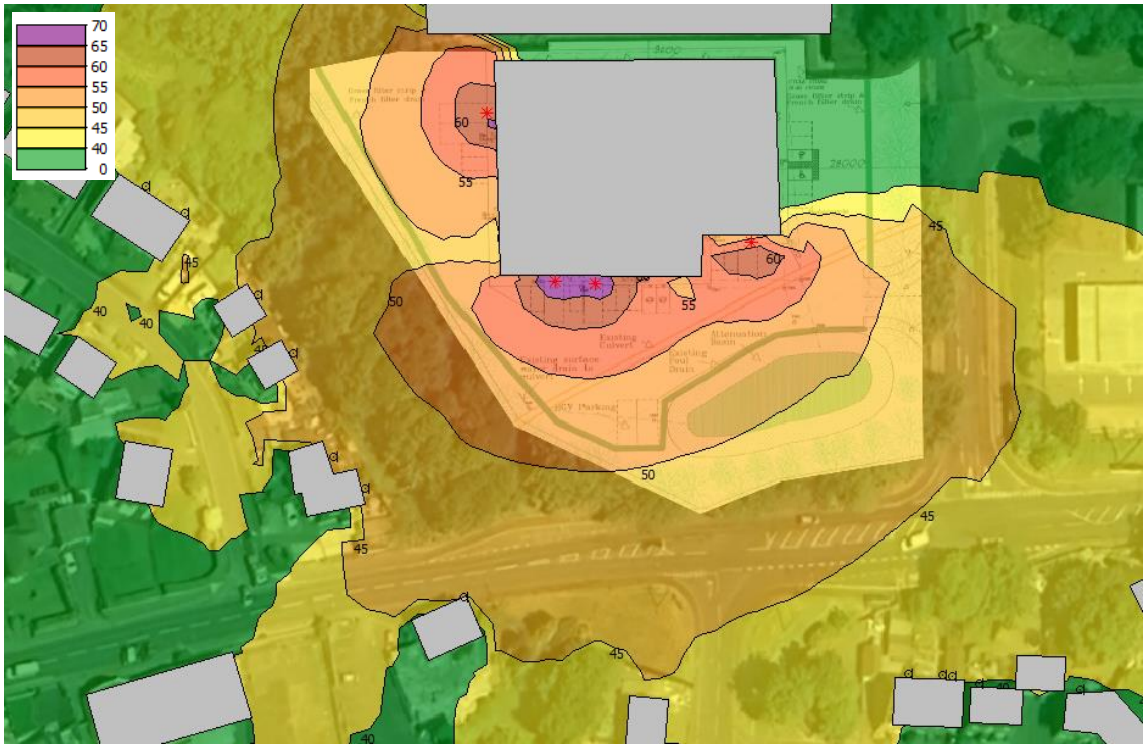
5.3.2 Unloading / loading

A typical unloading / loading noise level of 56dB $L_{Aeq,1hr}$ @10m is deemed representative based on similar sites / Hunter Acoustics database figures.

A prediction of potential daytime delivery noise impact has been carried out for Units 1-4 as follows, which includes delivery activity from both HGV and LGVs.

Based on a single unloading activity from the closest Unit 1, a noise level at 72B Elim Way of 43dB $L_{Aeq,1hr}$ is indicated. For a worst-case scenario of delivery activity at all Units 1, 2, 3 & 4 within an hour period a preliminary noise map model has been set up showing predicted levels:

Figure 5.2 - Worst Case Daytime Delivery Noise – $L_{Aeq,1hr}$



Worst-case daytime scenario noise levels are therefore indicated at 37-47dB $L_{Aeq,1hr}$ from all Units. Overall delivery noise levels are therefore below the daytime background sound climate of 52dB $L_{A90,1hr}$.

5.4 Typical External Activities

An indicative noise assessment of a typical 'noisy' B2 use which may be accommodated in the Units has been carried out.

An illustrative noise assessment of a Car Mechanic's workshop as assessed a reasonable scenario. Hunter Acoustics has database figures from similar sites and activities.

5.4.1 Source Noise Data

Data for source noise levels from typical garage activities have been taken from historical noise assessments carried out by Hunter Acoustics.

A summary of source noise levels / activities / tools is listed below:

Table 5.2 - Garage Source Noise Levels

Activity	Distance (m)	$L_{Aeq,T}$ (dB)	Typical Duration (s)
Roller Shutter Door (opening/closing)	1	71	35
Car entering/leaving garage	5	64	20-30
4-post jack-up ramp	1	76	30
Wheel nut removal/fitting – Pneumatic Impact Wrench	1	85	10
Tyre Removal - tyre changer machine	1	69	60
Tyre Fitting, inflating and seating	1	81	75
Tyre Reaming - pneumatic drill	1	92	6
Tyre Buffing - pneumatic tyre buffer	1	92	9
Wheel Balancing	1	51	20
Air Compressor	1	73	On/off

5.4.2 Garage Noise Prediction

This illustrative assessment of a typical garage assumes a normal daytime operation.

Assessments of a typical sized garage with two ramps/ indicate a worst-case hour could involve 3 to 4 vehicles, i.e. a maximum of 16 tyres. This 'worst case' scenario is considered robust.

Our predictions are therefore based on the following worst-case 1 hour of activities carried out at a garage, with an external compressor running for 50% of the time. Our assessment allows for the unit doors to be fully open.

We have therefore assessed a worst-case scenario from Unit 4, the closest receivers 50m away; doors are facing south, partially directed towards from receivers.

Table B.1 in Appendix B shows line-by-line garage noise prediction for Unit 4. Overall predicted levels are summarised in Table 5.3 below:

Table 5.3 – Garage Noise Levels

Location	Distance (m)	$L_{Aeq,T}$ (dB)
Unit 4	50	41

Overall predicted noise levels from garage activities over a worst-case hour are below the lowest daytime background noise level 52dB $L_{A90,1hr}$.
Garage activities are likely to contain regular impulsive noises from pneumatic tools. However at 50m away, any tonal and impulsive content from pneumatic tools is indicated

at 50-55dB $L_{Amax,F}$ and is unlikely to be clearly perceptible compared with relatively high daytime ambient road traffic noise levels of around 55dB L_{Aeq}. Even allowing for a 5dB penalty under BS4142:2014+A1:2019, rating levels are indicated to fall below the background sound climate. BS4142 therefore advises a low impact.

5.5 Break-out from Internal Noise

An initial assessment of the likely sound reduction of a basic industrial unit's fabric to demonstrate the "allowable" internal activity noise levels to meet the background sound level at the nearest residences has been carried out.

In order to assess the possible impact of noise from internal processes breaking out through the building fabric, a preliminary analysis has been put together calculating the limiting internal noise level required in order to meet the existing background sound.

Our analysis is based on a basic industrial cladding for walls and roof and doors closed.

For Class B1/B2/B8 an 87dB $L_{Aeq,1hr}$ internal noise level per unit has been assessed.

87dB(A) internally could be considered higher than reasonably expected for this kind of industrial unit. For reference 87dB(A) equates to the noise exposure limit value quoted in the latest Noise at Work regulations, indicating that the employee would need to control overall machinery noise below these levels. Therefore an 87dB(A) limit as indicated should not be considered unrealistic, or likely to place additional burdens on any operators.

Table 5.4 – Internal Noise and Cladding Performance

	Sound Pressure Level, dB								
	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dB(A)
Internal Noise Level	93.6	83.7	78.7	76.5	75.9	68.9	83.6	81.9	87.0

	Sound Reduction *R*, dB							
	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
Cladding	15.0	16.0	19.0	23.0	26.0	22.0	39.0	39.0

Figure 5.3 – Predicted Noise Break-out ($L_{Aeq,1hr}$)

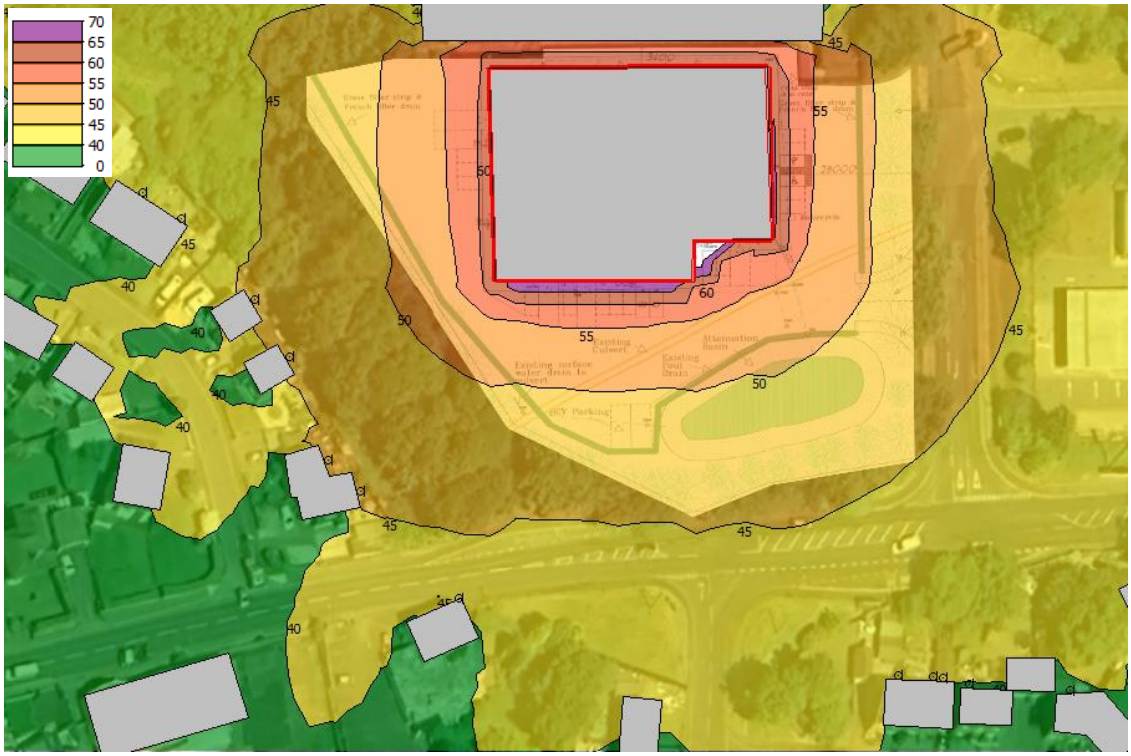


Table 5.5 – Overall Noise Break Out

Location	Internal Noise Level	Predicted Total at Elim Way $L_{Aeq,1hr}$ (dB)
Units 1-4	87	45

Therefore, based on an 87dB(A) internal noise level in each unit and allowing a 3dB BS4142 penalty for "general industrial characteristics", the worst-case scenario of all units operating is indicated to fall below the 52dB $L_{A90,1hr}$ daytime background sound level. It should be noted that this is for worst-case activity at all units (1-4) operating at these high internal noise levels, which could be considered unlikely.

5.6 Cumulative Impact Assessment

Based on the above assessed activities a cumulative noise impact assessment has been carried out for the scenario where all activities occur within an hour daytime period. We have set out two likely operating scenarios for context to illustrate the likely noise impact. This is considered a robust approach.

5.6.1 With HGV Movement & Delivery Activity

Table 5.6 - Cumulative Noise Impact with HGV & Delivery

Location	Activity / Noise Source	Predicted Total $L_{Aeq,1hr}$ (dB)
72-74 Elim Way	HGV Movement (1 off)	46
	Deliveries (All Units)	47
	Car Garage (1 unit)	41
	Plant (All Units)	46
	Break-Out (All Units)	45
Cumulative Noise Level		52
+3dB BS4142 penalty for "general industrial characteristics" =		55dB $L_{Ar,1hr}$

5.6.2 Without HGV Movement & Delivery Activity

Table 5.7 - Cumulative Noise Impact without HGV & Delivery

Location	Activity / Noise Source	Predicted Total $L_{Aeq,1hr}$ (dB)
72-74 Elim Way	Car Garage (1 unit)	41
	Plant (All Units)	46
	Break-Out (All Units)	45
Cumulative Noise Level		49
+3dB BS4142 penalty for "general industrial characteristics" =		52dB $L_{Ar,1hr}$

5.6.3 Overall Assessment

For periods of general commercial activity at the units, worst-case noise rating levels are indicated to not exceed the daytime background sound level.

For occasional daytime periods where HGVs access the site and delivery activities occur, a +3dB excess over background is indicated.

Overall taking into account the possible operating scenarios, an adverse impact is not indicated to be likely, in the context of normal daytime uses.

6. CONCLUSION

An environmental noise assessment has been carried out for the proposed Frontier Site, Newbridge Road Industrial Estate, Pontllanfraith, NP12 2AN.

Background sound levels have been measured on site (representative of the nearest sound sensitive receptors) and have been used as a basis for assessing the likely impact of fixed plant, deliveries, a typical car mechanics operation and to demonstrate the "allowable" internal activity noise levels to meet the background sound level at the nearest residences, taking into account all 4no proposed units.

The following is advised:

- Plant noise limits for the have been set in line with BS4142:2014 guidance with the aim of designing the rating level to the existing background sound climate.

- An assessment of likely daytime delivery movements to the units has also been carried out with worst-case HGV access movement noise levels indicated at up to 46dB $L_{Aeq,1hr}$, with unloading activities are indicated in the range of 37-47 dB $L_{Aeq,1hr}$

- Overall predicted noise levels from typical garage activities over a worst-case hour are indicated well below the lowest daytime background sound level

- An assessment of permissible Internal Noise Levels indicates up an Internal noise level of up to 87dB(A) which should not be considered unrealistic, or likely to place additional burdens on any operators.

An overall cumulative noise impact assessment of all likely noise sources has been carried out for a robust assessment. General commercial activity noise is not indicated to exceed the daytime background noise levels, with occasional periods of HGV movement and deliveries at +3dB above background. An adverse impact is therefore indicated to be unlikely.

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.
$L_{Ar,Tr}$	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

APPENDIX B - DIAGRAMS, GRAPHS AND TABLES

Figure B.1 – Approximate Weather History for Wednesday, 06 March 2024

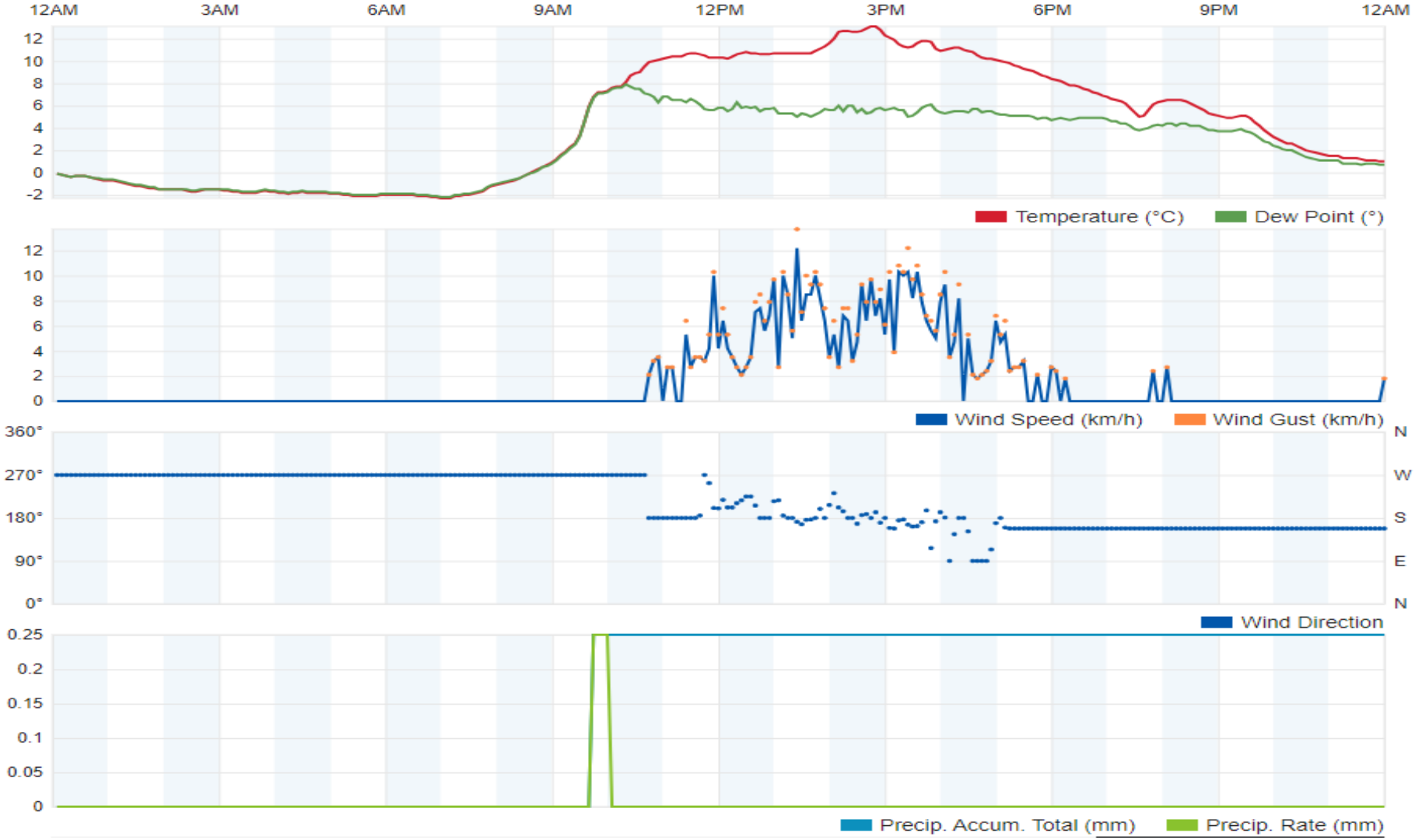
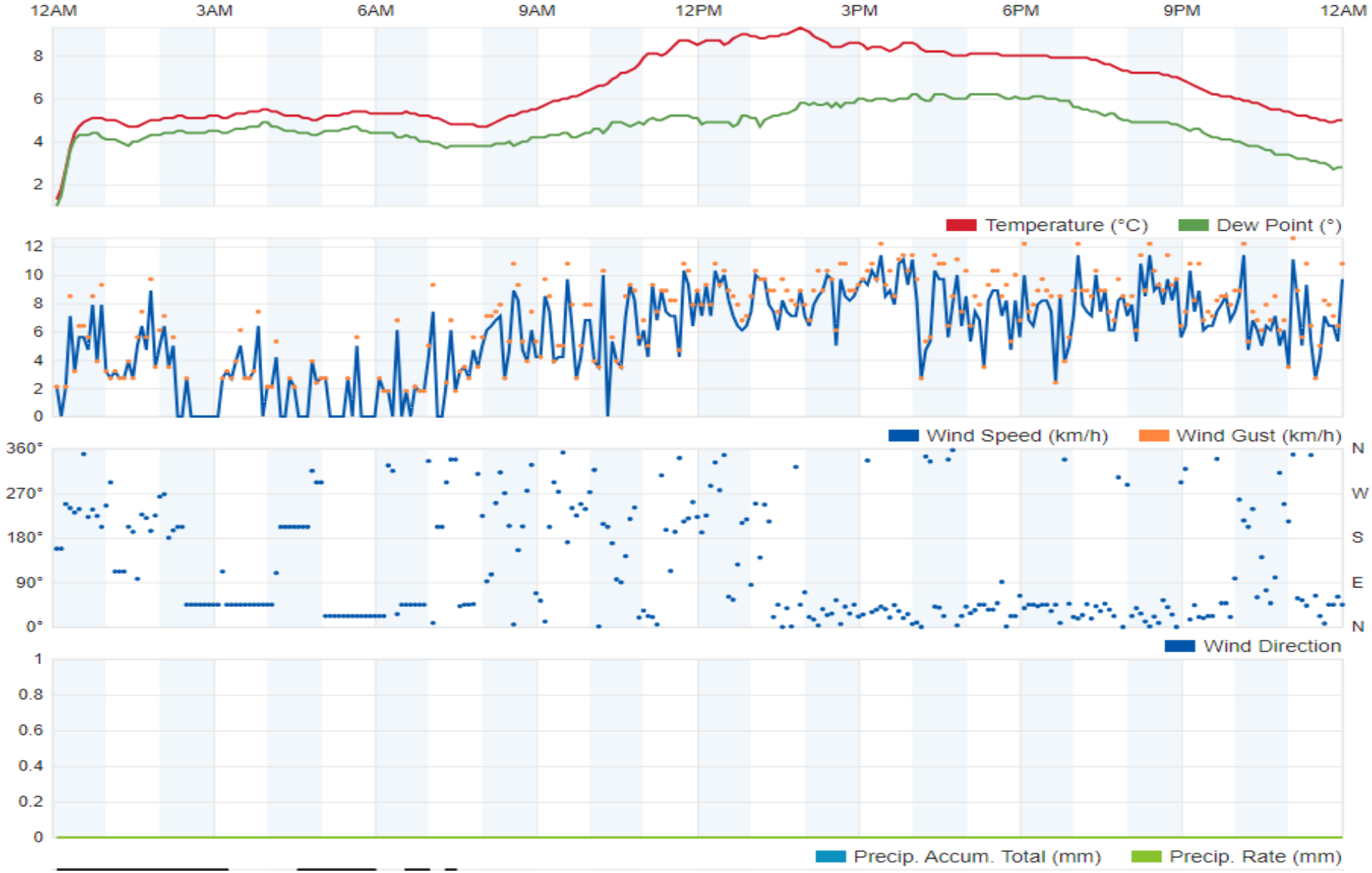


Figure B.2 – Approximate Weather History for Thursday, 07 March 2024



Note: Taken from www.wunderground.com - weather station IBLACK63 located in Pontllanfraith [Elev 155 m, 51.66 °N, 3.18 °W]

Figure B.3 – Time History at Position A (Wednesday, 06 March 2024 to Thursday, 07 March 2024)

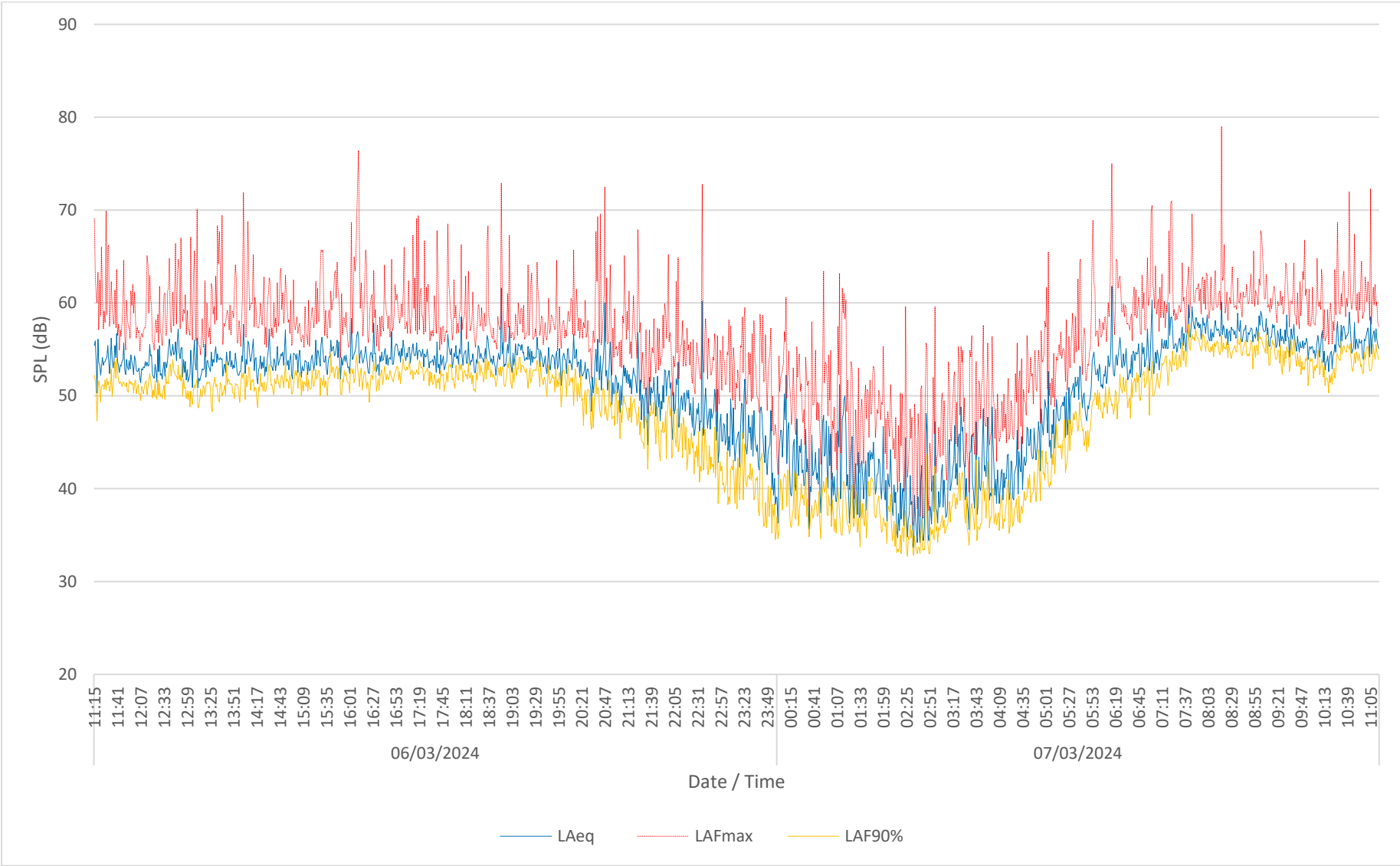


Figure B.4 – Statistical Analysis of Background Sound Levels Measured at Position A

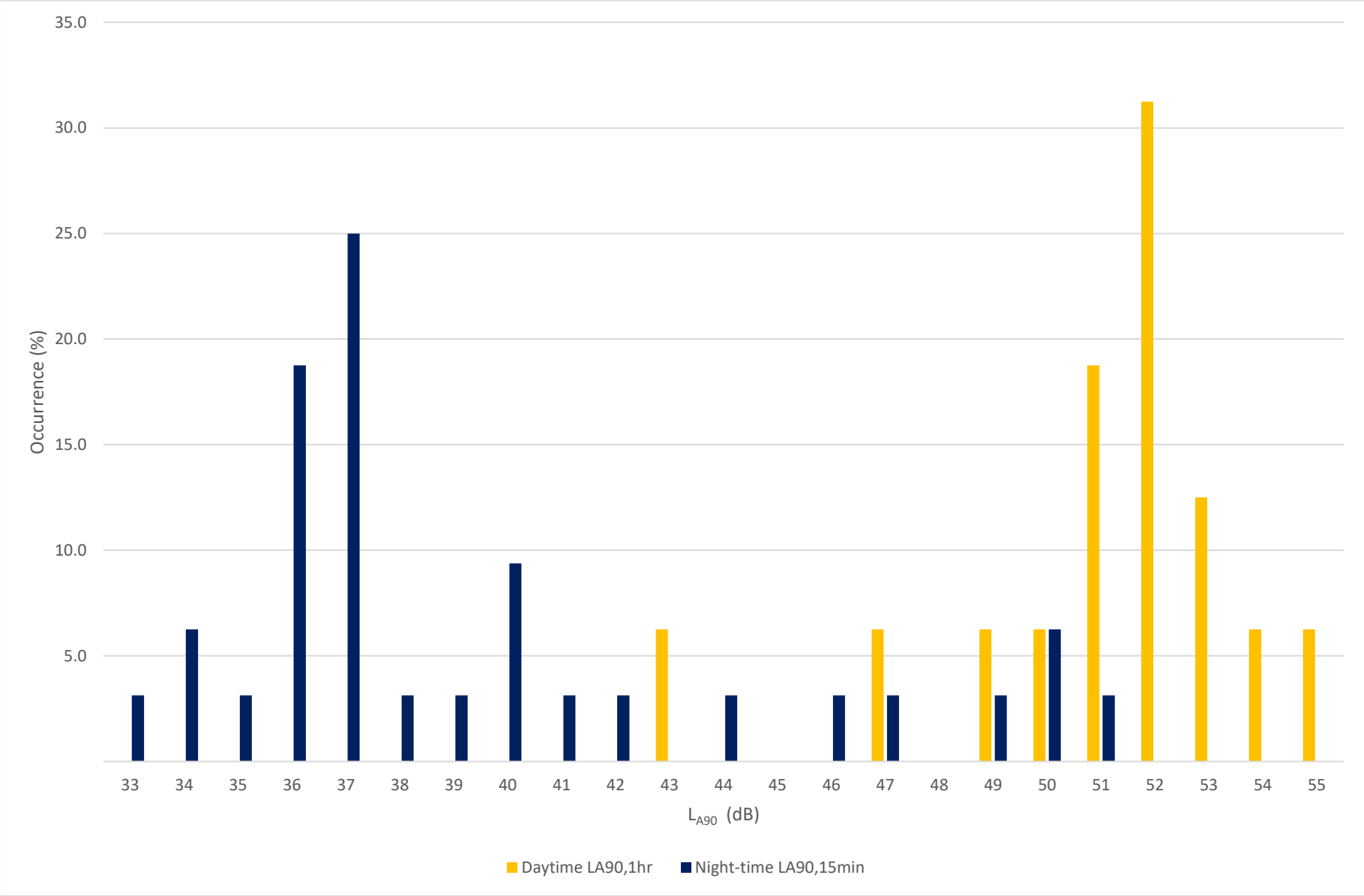


Table B.1 - Unit 4 Garage Noise Break-out Prediction

Activity, 1hr - 4 Vehicles	Duration, s	Typical Worst Case No off	Total Duration, s	Measured L_{eq} dB(A)	Distance Losses to Elim Way (50m)	Sceening Losses	Time Correction to $L_{eq,1hr}$	Resultant $L_{eq,1hr}$
Roller Shutter Door	35	1	35	**71**	-34	0	-20	17
Car pulling into depot	20	4	80	**64**	-34	0	-17	13
Jacking up car	30	4	120	**76**	-34	-5	-15	22
Removing Wheels	10	16	160	**85**	-34	-5	-14	32
Tyre fitting machine (taking tyre off)	60	16	960	**69**	-34	-5	-6	24
Puncture Repair - Reaming	6	4	24	**92**	-34	-5	-22	31
Puncture Repair - Buffing	9	4	36	**92**	-34	-5	-20	33
Tyre fitting machine (putting tyre on and inflating)	75	16	1200	**77**	-34	-5	-5	33
Tyre Seating	10	16	160	**81**	-34	-5	-14	28
Wheel Balancing	20	16	320	**51**	-34	-5	-11	2
Putting wheel back on using air gun / wheel brace	10	16	160	**85**	-34	-5	-14	32
Jacking down car	30	4	120	**76**	-34	-5	-15	22
Car pulling out of depot	30	4	120	**64**	-34	0	-15	15
Compressor switching on and off, when tools are used, worst case 50%			1800	**73**	-34	-5	-3	31
							Resultant $L_{Aeq,1hr}$ =	**41**

APPENDIX C - DRAWING LISTS

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

Table C.1 –Drawing List

Drawing Number	Rev	Date	Drawing Title
328051/1	J	-	Site Layout
328051/2	C	-	Proposed Industrial Building – Layout, Sections and Elevations
328051/3	-	-	Site Location Plan as Existing

Table C.2 – Corun Document List

Document Number	Rev	Date	Drawing Title
22-00794/TS/01	-	March 2024	Transport Statement