

33-35 High Street Glynneath, Neath

Planning Compliance Report
Report 25112.PCR.01

Photo-Me International plc
Unit 3B
Blenheim Road
Epsom
Surrey
KT19 9AP

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25112.TH1	Environmental Noise Time History
25112.Daytime.LA90	Statistical analysis for representative daytime L_{A90}
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Appendix A	Glossary of Acoustics Terminology
Appendix B	Plant Noise Emissions Calculations

1.0 INTRODUCTION

KP Acoustics Ltd has been commissioned by Photo-Me International plc, Unit 3B, Blenheim Road, Epsom, Surrey KT19 9AP, to undertake an environmental noise survey at 33-35 High Street, Glynneath, Neath SA11 5BS. The background noise levels measured will be used to determine noise emission criterion for a mobile laundrette installation, in agreement with the planning requirements of Neath Port Talbot County Borough Council and British Standard BS4142:2014 + A1:2019.

This report presents the overall methodology and results from the environmental survey, followed by calculations to demonstrate the feasibility of the mobile laundrette unit installation to satisfy the emissions criterion at the closest noise-sensitive receiver.

2.0 SITE SURVEYS

2.1 Site Description

As shown in Figure 2.1, the site is bounded by Glynneath High Street to the south, residential and commercial buildings to the west and east, and Ysgol Gynradd Gymraeg Cwmnedd primary school playground to the north.

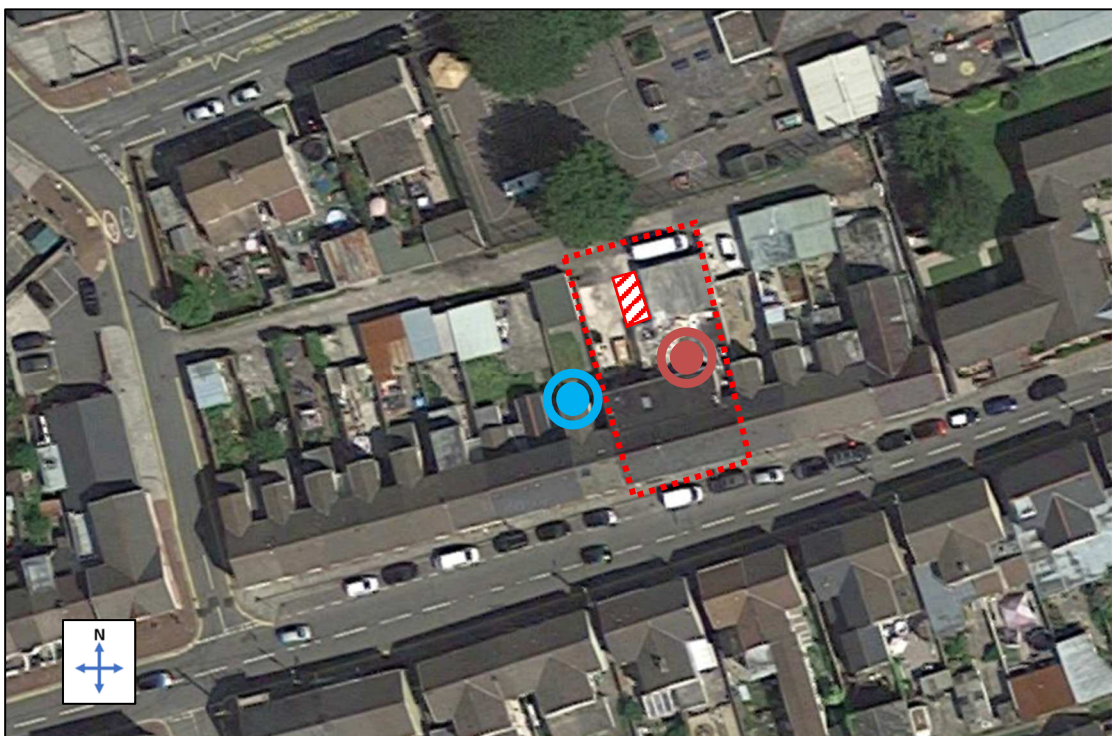


Figure 2.1 Site Location Plan (Image Source: Google Maps)

Initial inspection of the site revealed that the background noise profile at the monitoring location was typical of an urban environment, with the dominant source being road traffic noise from the High Street. It should be noted that during term time, the background noise profile of the area will be significantly higher due to noise from the primary school playground.

2.2 Environmental Noise Survey Procedure

Continuous automated monitoring was undertaken for the duration of the noise survey between 14:11 on 08/08/2022 and 12:11 on 09/08/2022.

The environmental noise measurement position, mobile laundrette location, and the closest noise sensitive receiver relative to the mobile laundrette installation are described within Table 2.1 and shown within Figure 2.1.

Manual measurements were undertaken at 1m away from the mobile laundrette installation to establish the noise emissions data of the installation. Noise data was collected over a 30-minute period when all units in the mobile laundrette installation were in use.

Icon	Descriptor	Location Description
	Noise Measurement Position	The microphone was installed on the rear first-floor window at 33-35 High Street. A correction of 3dB has been applied to account for non-free field conditions.
	Closest Noise Sensitive Receiver	First-floor window of 29 High Street.
	Mobile Laundrette Installation	Mobile laundrette installation is outlined in Section 5.1.

Table 2.1 Measurement position and description

The choice of the position was based both on accessibility and on collecting representative noise data in relation to the nearest noise sensitive receiver relative to the mobile laundrette.

Weather conditions were generally dry with light winds and therefore suitable for the measurement of environmental noise. The measurement procedure complied with ISO 1996-2:2017 Acoustics '*Description, measurement and assessment of environmental noise - Part 2: Determination of environmental noise levels*'.

2.3 Equipment

The equipment calibration was verified before and after use and no abnormalities were observed. The equipment used is described within Table 2.2.

Measurement instrumentation		Serial no.	Date	Cert no.
Noise Kit 23	NTI Audio XL2 Class 1 Sound Level Meter	A2A-21143-E0	21/07/2022	UK-22-072
	Free-field microphone NTI Acoustics MC230A	A23366		
	Preamp NTI Acoustics MA220	11034		
	NTI Audio External Weatherproof Shroud	-	-	-
Larson Davis CAL200 Class 1 Calibrator		17148	18/03/2022	UCRT22/1397

Table 2.2 Measurement instrumentation

3.0 RESULTS

The $L_{Aeq: 5min}$, $L_{Amax: 5min}$, $L_{A10: 5min}$ and $L_{A90: 5min}$ acoustic parameters were measured throughout the duration of the survey. Measured levels are shown as a time history in Figure 25112.TH1. Representative background noise levels are shown in Table 3.1 for daytime and night-time.

It should be noted that the representative background noise level has been derived from the most commonly occurring $L_{A90,5 min}$ levels measured during the environmental noise survey undertaken on site, as shown in 25112.Daytime.LA90 and 25112.Night-time.LA90 attached.

Time Period	Representative background noise level L_{A90} dB(A)
Daytime (07:00-23:00)	40
Night-time (23:00-07:00)	32

Table 3.1 Representative background noise levels

4.0 NOISE ASSESSMENT GUIDANCE

4.1 BS4142: 2014 '*Methods for rating and assessing industrial and commercial sound*'

British Standard BS4142:2014 '*Methods for rating and assessing industrial and commercial sound*' describes a method for rating and assessing sound of an industrial and/or commercial nature, which includes:

- Sound from industrial and manufacturing processes
- Sound from fixed installations which comprise mechanical and electrical plant and equipment
- Sound from the loading and unloading of goods and materials at industrial and/or commercial premises, and
- Sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises or processes.

This Standard compares the Rating Level due to the noise source/s under assessment for a one-hour period during the daytime (07:00 – 23:00 hours) and a fifteen-minute period during the night-time (23:00 – 07:00 hours) with the existing background noise level in terms of an L_{A90} when the noise source is not operating.

It should be noted that the Rating Level is the Specific Sound Level in question ($L_{Aeq, Tr}$), including any relevant acoustic feature corrections, as follows:

- **Tonality** – '*For sound ranging from not tonal to prominently tonal the Joint Nordic Method gives a correction of between 0dB and +6dB for tonality. Subjectively, this can be converted to 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 correction of up to +9dB can be applied for sound that is highly impulsive, considering both the rapidity of the change in sound level and the overall change in sound level. Subjectively, this can be converted to a penalty of 3dB for impulsivity which is just perceptible at the noise receptor, 6dB where it is clearly perceptible, and 9dB where it is highly perceptible*'
- **Intermittency** – '*If the intermittency is readily distinctive against the residual acoustic environment, a penalty of 3dB can be applied*'

- **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’*

Once the Rating Level has been obtained, the representative background sound level is subtracted from the Rating Level to obtain an initial estimate of the impact, as follows:

- Typically, the greater this difference, the greater the magnitude of the impact
- A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context
- A difference of around +5 dB could 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 there will be an adverse impact or significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound having a low impact, depending on the context

The initial estimate of the impact may then be modified by taking consideration of the context in which the sound occurs.

5.0 NOISE IMPACT ASSESSMENT

5.1 Mobile Launderette

It is understood that the mobile laundrette installation is comprised of the following units:

- 1 No. 20kg load dryer
- 1 No. 20kg load washing machine
- 1 No. 11kg load washing machine

The units are mounted within a kiosk-style enclosure, with proprietary anti-vibration systems serving each individual unit in order to mitigate both noise and vibration emissions from the units during their spin cycles.

Manual noise measurements were taken during a 30-minute period in which all three units were operating simultaneously. The microphone was installed on a tripod 1m from the centre of the laundrette, as shown in Figure 5.1. During the final 10 minutes, all three units were operating at the loudest point of their cycle, enabling worst-case noise levels from the mobile laundrette installation to be captured.

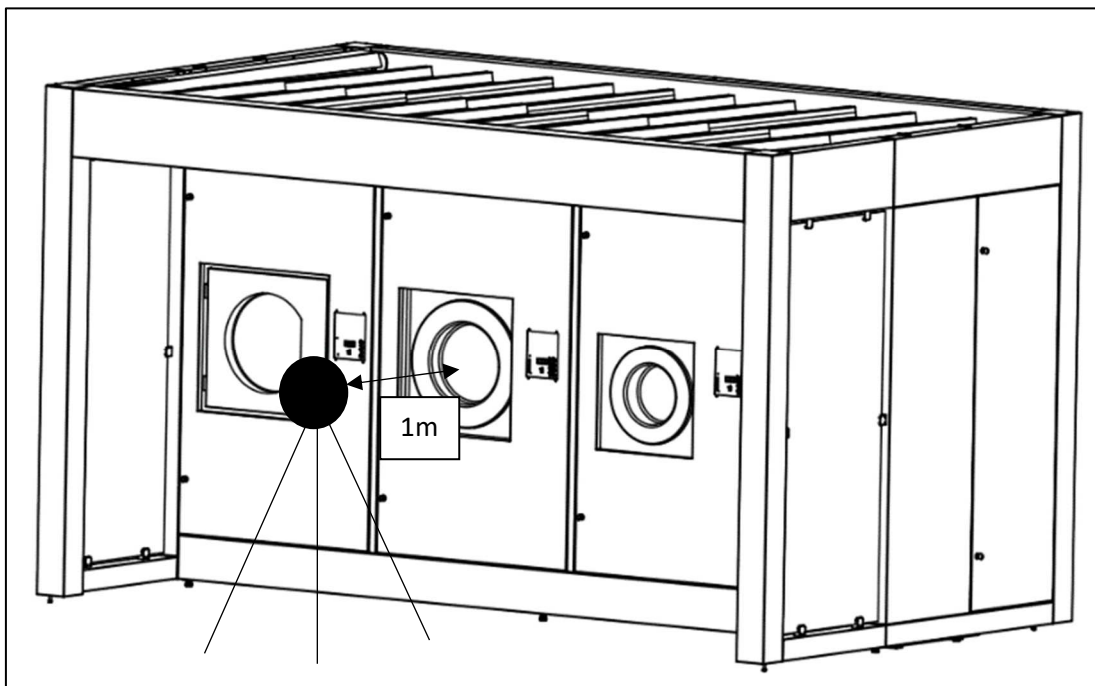


Figure 5.1 Noise measurement positions at 1m from the front of the mobile laundrette installation

Unit	Sound Pressure Level (dB) in each Frequency Band (at 1m)								Overall (dBA)
	63	125	250	500	1k	2k	4k	8k	
Mobile Launderette: Washers and Dryer	62	67	61	62	59	54	50	41	64

Table 5.1 Measured sound pressure level at 1m from washers and dryer (final 10 minutes)

The 20kg load dryer unit is connected to a water vapor vent located on the left-hand side of the mobile launderette unit approximately 0.25m from the floor. Noise levels were measured 1m from the water vapor vent and are shown in Table 5.2 below.

Unit	Sound Pressure Level (dB) in each Frequency Band (at 1m)								Overall (dBA)
	63	125	250	500	1k	2k	4k	8k	
Mobile Launderette: Water Vapor Vent	65	66	58	62	65	55	51	44	67

Table 5.2 Measured sound pressure level at 1m from water vapor vent (final 10 minutes)

Analysis of the manual measurements for the washers, dryer and water vapor vent show that no tonal component is present in the source noise.

The closest residential window was identified as being the rear first-floor window of 29 High Street, which is located approximately 17 metres from the mobile launderette installation.

It should be noted that the kiosk itself forms a robust acoustic barrier from the noise emissions from the front of the units, which provides a level of attenuation to the closest noise sensitive receivers.

5.2 Calculations

Taking all acoustic corrections into consideration, the noise level contribution expected at the closest residential window from the mobile laundrette installation during daytime and night-time hours would be as shown in Table 5.3. Detailed calculations are shown in Appendix B.

Time	Representative Background Noise Level (L_{A90})	Predicted Rating Noise Level at 1m From the Closest Noise Sensitive Window
Daytime Hours (07:00-23:00)	40dB(A)	35dB(A)
Night-time Hours (23:00-07:00)	32dB(A)	

Table 5.3 Predicted rating noise levels and representative background noise levels at rear first-floor window of 29 High Street

As shown in Appendix B and Table 5.3, transmission of noise to the closest noise sensitive window due to the effects of the mobile laundrette would be 5dB below the background noise level during daytime hours, and 3dB above the background noise level during night-time hours.

5.3 Discussion

A rating level of 5dB below the representative background noise level during daytime hours would typically be an indicator that there would be a low likelihood of adverse impact. However, a rating level of 3dB above the representative background noise level during night-time hours may be an indicator that there would be a likelihood of adverse impact.

Based on the above, it would be recommended that whilst the mobile laundrette would be suitable for use during daytime hours (07:00-23:00), it should be programmed to be non-operational during night-time hours (23:00-07:00) to avoid adverse impact upon the closest residential receiver.

6.0 CONCLUSION

An environmental noise survey has been undertaken at 33-35 High Street, Glynneath, Neath SA11 5BS by KP Acoustics Ltd between 14:11 on 08/08/2022 and 12:11 on 09/08/2022. The results of the survey have enabled a representative background noise level to be set.

Using noise data measured at a mobile laundrette installed on site, noise levels are predicted at the nearby noise sensitive receiver for compliance with current requirements.

Calculations in accordance with BS4142:2014 show that noise emissions from the mobile laundrette would result in a low magnitude of impact and an indication of low adverse impact on the closest residential receiver during daytime, but a likely indication of an adverse impact during night-time hours.

Therefore, the mobile laundrette should be programmed to only be usable during daytime hours, with appropriate signage put in place to inform customers of the hours of use (07:00-23:00).

33-35 High Street, Glynneath, Neath SA11 5BS - Position 1
Environmental Time History
08/08/2022 to 09/08/2022

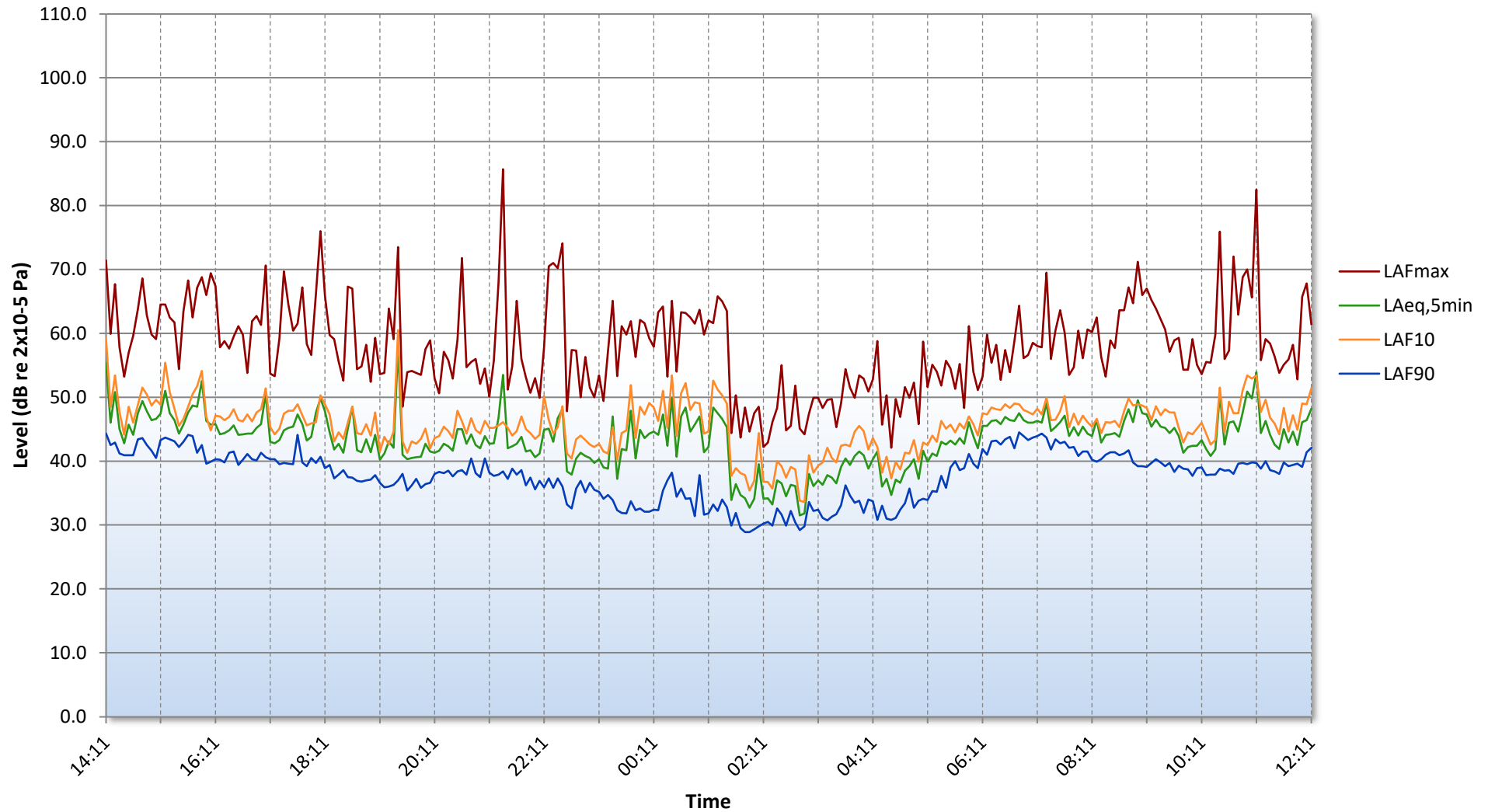


Figure 25112.TH1

33-35 High Street, Glynneath, Neath SA11 5BS - Position 1
Representative Daytime Background Noise Level
08/08/2022 to 09/08/2022

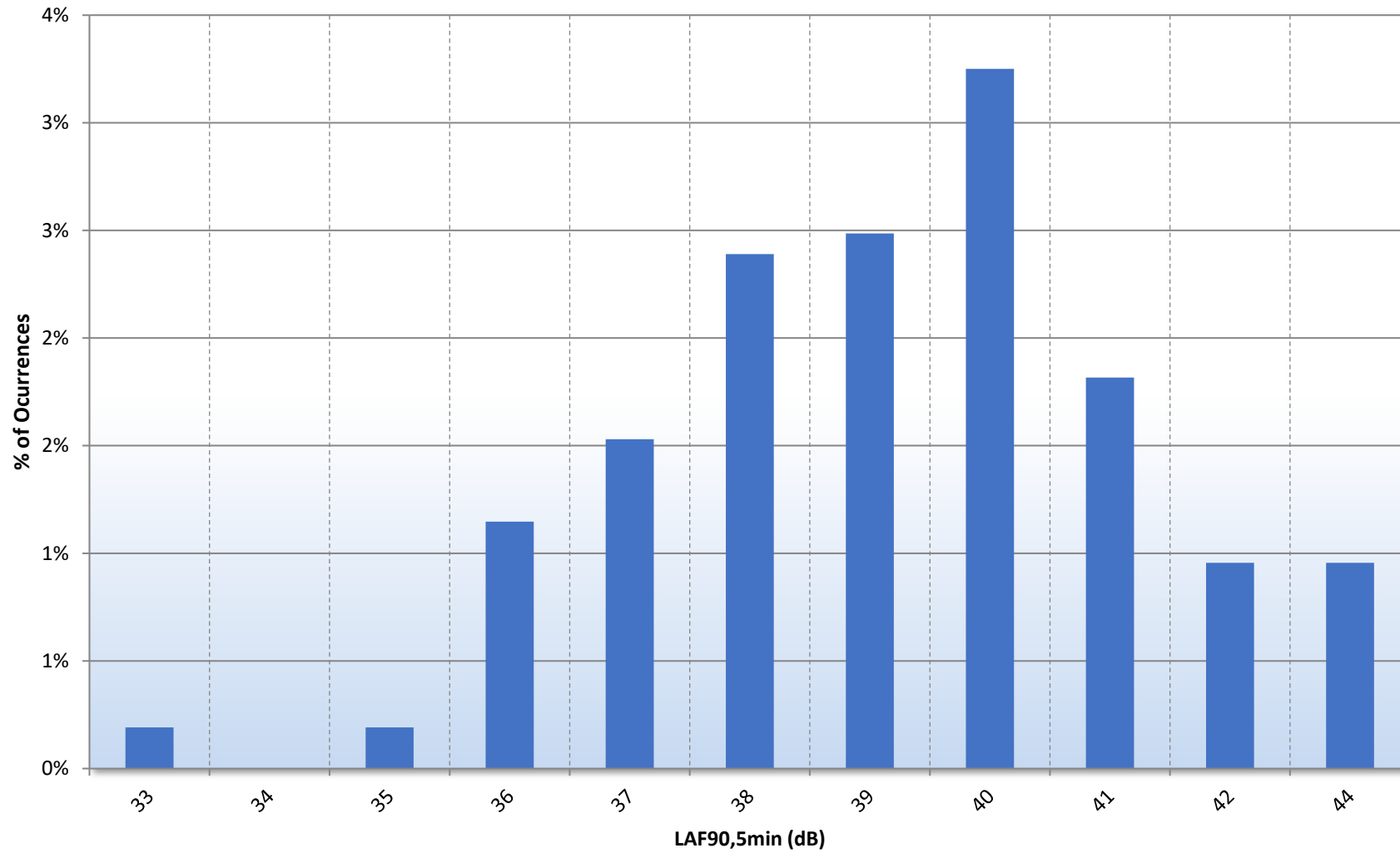


Figure 25112.Daytime L90.TH1

33-35 High Street, Glynneath, Neath SA11 5BS - Position 1
Representative Night-time Background Noise Level
08/08/2022 to 09/08/2022

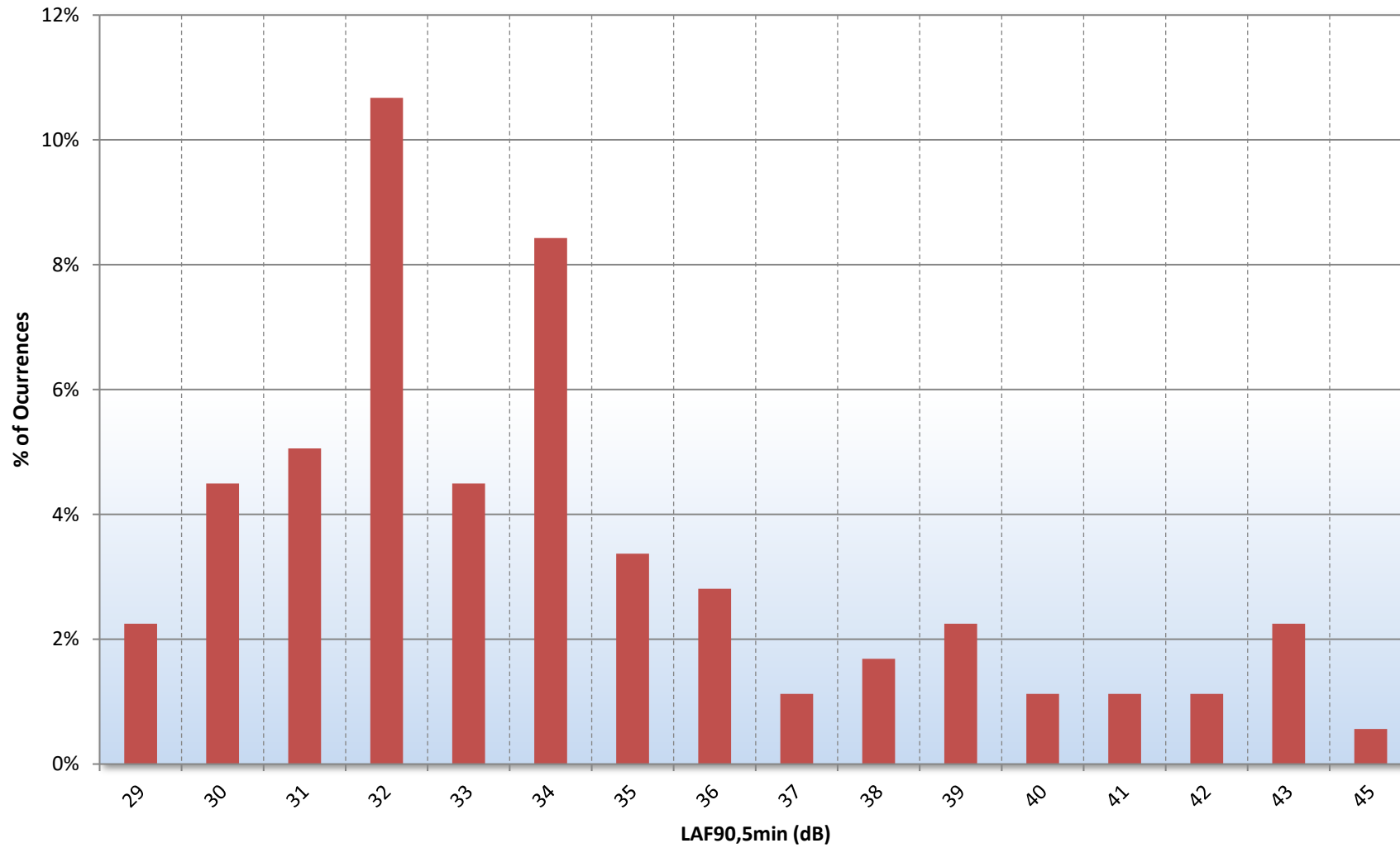


Figure 25112.Night-time L90.TH1

GENERAL ACOUSTIC TERMINOLOGY

Decibel scale - dB

In practice, when sound intensity or sound pressure is measured, a logarithmic scale is used in which the unit is the 'decibel', dB. This is derived from the human auditory system, where the dynamic range of human hearing is so large, in the order of 10^{13} units, that only a logarithmic scale is the sensible solution for displaying such a range.

Decibel scale, 'A' weighted - dB(A)

The human ear is less sensitive at frequency extremes, below 125Hz and above 16Khz. A sound level meter models the ears variable sensitivity to sound at different frequencies. This is achieved by building a filter into the Sound Level Meter with a similar frequency response to that of the ear, an A-weighted filter where the unit is dB(A).

L_{eq}

The sound from noise sources often fluctuates widely during a given period of time. An average value can be measured, the equivalent sound pressure level L_{eq} . The L_{eq} is the equivalent sound level which would deliver the same sound energy as the actual fluctuating sound measured in the same time period.

L_{10}

This is the level exceeded for no more than 10% of the time. This parameter is often used as a "not to exceed" criterion for noise.

L_{90}

This is the level exceeded for no more than 90% of the time. This parameter is often used as a descriptor of "background noise" for environmental impact studies.

L_{max}

This is the maximum sound pressure level that has been measured over a period.

Octave Bands

In order to completely determine the composition of a sound it is necessary to determine the sound level at each frequency individually. Usually, values are stated in octave bands. The audible frequency region is divided into 11 such octave bands whose centre frequencies are defined in accordance with international standards. These centre frequencies are: 16, 31.5, 63, 125, 250, 500, 1000, 2000, 4000, 8000 and 16000 Hertz.

Environmental noise terms are defined in BS7445, *Description and Measurement of Environmental Noise*.

APPLIED ACOUSTIC TERMINOLOGY

Addition of noise from several sources

Noise from different sound sources combines to produce a sound level higher than that from any individual source. Two equally intense sound sources operating together produce a sound level which is 3dB higher than a single source and 4 sources produce a 6dB higher sound level.

Attenuation by distance

Sound which propagates from a point source in free air attenuates by 6dB for each doubling of distance from the noise source. Sound energy from line sources (e.g. stream of cars) drops off by 3dB for each doubling of distance.

Subjective impression of noise

Hearing perception is highly individualised. Sensitivity to noise also depends on frequency content, time of occurrence, duration of sound and psychological factors such as emotion and expectations. The following table is a guide to explain increases or decreases in sound levels for many scenarios.

Change in sound level (dB)	Change in perceived loudness
1	Imperceptible
3	Just barely perceptible
6	Clearly noticeable
10	About twice as loud

Transmission path(s)

The transmission path is the path the sound takes from the source to the receiver. Where multiple paths exist in parallel, the reduction in each path should be calculated and summed at the receiving point. Outdoor barriers can block transmission paths, for example traffic noise. The effectiveness of barriers is dependent on factors such as its distance from the noise source and the receiver, its height and construction.

Ground-borne vibration

In addition to airborne noise levels caused by transportation, construction, and industrial sources there is also the generation of ground-borne vibration to consider. This can lead to structure-borne noise, perceptible vibration, or in rare cases, building damage.

Sound insulation - Absorption within porous materials

Upon encountering a porous material, sound energy is absorbed. Porous materials which are intended to absorb sound are known as absorbents, and usually absorb 50 to 90% of the energy and are frequency dependent. Some are designed to absorb low frequencies, some for high frequencies and more exotic designs being able to absorb very wide ranges of frequencies. The energy is converted into both mechanical movement and heat within the material; both the stiffness and mass of panels affect the sound insulation performance.

APPENDIX B

33-35 High Street, Glynneath, Neath SA11 5BS

PLANT NOISE EMISSIONS CALCULATIONS

Source: Mobile Laundrette Installation	Frequency, Hz								dB(A)
Receiver: Rear First-floor window of 29 High Street	63	125	250	500	1k	2k	4k	8k	
Washers and Dryer (Sound Pressure Level @1m)	62	67	61	62	59	54	50	41	64
Minimum attenuation provided by glazed screen of kiosk, dB	-2	-4	-6	-8	-11	-12	-12	-12	
Minimum attenuation provided by distance (17m), dB	-25	-25	-25	-25	-25	-25	-25	-25	
Total Specific Level of Washers and Dryer at Receiver	35	39	31	29	24	17	13	4	30
Water Vapor Vent (Sound Pressure Level @1m)	65	66	58	62	65	55	51	44	67
Minimum attenuation provided by glazed screen of kiosk, dB	-2	-4	-6	-8	-11	-12	-12	-12	
Minimum attenuation provided by distance (17m), dB	-25	-25	-25	-25	-25	-25	-25	-25	
Total Specific Level of Water Vapor Vent at Receiver	38	38	28	29	30	18	14	7	32
Total Specific Level of Mobile Laundrette at Receiver	40	41	33	32	31	21	17	9	35
BS4142 Acoustic Feature Corrections									
Tonality									0
Impulsivity									0
Intermittency									0
Total Rating Noise Level of all Plant Unit Installations at Receiver									35
Representative Background Noise Level During Daytime									
Representative Background Noise Level During Night-time									