

PAT'S COACHES, SOUTHSEA ROAD, WREXHAM

NOISE IMPACT ASSESSMENT

On behalf of:
Pat's Coaches

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1.0 INTRODUCTION

- 1.1 Hepworth Acoustics Ltd was commissioned by Pat's Coaches to carry out a noise impact assessment in connection with a retrospective planning application for the parking of employee/employer cars at Pat's Coaches, Southsea Road, Wrexham.
- 1.2 Currently employee/employer domestic vehicles (i.e. cars) are parked on a small area of land to the west of the main yard area. We understand permission was granted for extension into this area prior to Covid 19 pandemic however this has now lapsed.
- 1.3 We understand that Wrexham County Borough Council have raised concerns about potential noise impact on the nearest dwellings from vehicle movements on the site, particularly overnight.
- 1.4 The premises are located on Southsea Road and the nearest dwellings are either side of the site. The location of the site is shown in Figure 1.
- 1.5 The noise assessment has included:
 - An inspection of the site and surrounding area;
 - Measurement of ambient/background noise levels during a weekday night-time period;
 - Assessment of potential noise impact at the nearest dwellings from night-time vehicle movements;
 - Recommendation of mitigation measures if appropriate.
- 1.6 The various noise units and indices referred to in this report are described in Appendix I. All noise levels mentioned in the text have been rounded to the nearest decibel, as fractions of decibels are imperceptible.

2.0 GUIDANCE

Planning Policy Wales: Edition 11 (Feb 2021)

- 2.1 Planning Policy Wales (PPW) 2021 6.7.7 states that *“To assist decision making it will be important that the most appropriate level of information is provided and it may be necessary for a technical noise assessment to be undertaken by a suitably qualified and competent person on behalf of the developer.”*

Planning Guidance (Wales), Technical Advice Note (Wales) 11, Noise (Oct 1997)

- 2.2 Technical Advice Note 11 (TAN 11) 8 states that *“Local planning authorities must ensure that noise generating development does not cause an unacceptable degree of disturbance.”*
- 2.3 TAN 11 refers to the two most often used British Standards that relate to controlling environmental noise but neither are applicable in this particular case.

BS 8233:2014

- 2.4 British Standard 8233: 2014, ‘Guidance on sound insulation and noise reduction for buildings’ is a wide-ranging British Standard which provides guidance on appropriate noise levels in a range of different building types including dwellings. BS 8233 recommends that it is desirable that noise from external sources does not exceed the guidelines values that are shown in Table 1 inside habitable rooms for daytime (07:00 – 23:00 hours) and night-time (23:00 – 07:00 hours) periods.

Table 1: BS 8233:2014 recommended acoustic design criteria (dB $L_{Aeq,T}$)

Activity	Location	Daytime 07:00 – 23:00 hours	Night-time 23:00 – 07:00 hours
Resting	Living room	35	-
Dining	Dining room/area	40	-
Sleeping (daytime resting)	Bedroom	35	30

- 2.5 An assessment of the potential noise is detailed in Section 4 of this report.

3.0 NOISE SURVEY

- 3.1 An environmental noise survey was carried out at a location that is representative of the nearest dwellings adjacent to the west of the site on Station Road. The noise measurement location is shown in Figure 1.
- 3.2 An automated noise survey was carried out between approximately 14:45 on Monday 15 to 09:30 on Tuesday 16 January 2024.
- 3.3 The noise measurements were taken in consecutive 15-minute periods in 'free-field' conditions and at a microphone height of approximately 1.4 m above the ground. Calibration checks were carried out both before and after the measurement period with no variance in levels noted. Frequency analysis was carried out as well as audio-recording.
- 3.4 The weather conditions during the noise survey were considered acceptable for the purposes of the survey and subsequent assessment.
- 3.5 The results of the noise survey are summarised in Tables 1 and 2, the full results along with details of the equipment used and the weather conditions during the survey are shown in Appendix II.

Table 1: Summary of noise levels measured at location representative of nearest dwelling (dB)

Period	L_{AFmax}	$L_{Aeq,15\ min}$
Night-time (23:00 – 07:00)	45 – 67	29 – 52

Table 2: Analysis of noise levels over sensitive periods (dB)

Period	Average $L_{Aeq,1hr}$
23:00 – 00:00	41
00:00 – 01:00	36
06:00 – 07:00	50

- 3.6 During survey, the noise climate of the area was dominated by road traffic on Southsea Road.
- 3.7 The appropriate value for each hourly period has been adopted in our assessment described in Section 4.0.

4.0 NOISE ASSESSMENT

- 4.1 Potential noise from use of the staff car park is quite transient, ranging from no activity for long periods of time to five or six cars arriving over a one hour period. The majority of vehicle movements will occur before the start of the school run shift (i.e. cars arriving from 06:00 hours) and vehicle movements associated on completion of the school run around 18:00 hours.
- 4.2 There are also occasional drivers arriving late at night (i.e. between midnight and 01:00 hours) to start a tour contract, however the coach will then not return for 14 days.
- 4.3 Cars manoeuvring at slow speeds in car parks generate low levels of noise, but higher levels can be generated (albeit briefly) from car doors being closed. In order to determine the likely car park noise levels outside the nearest dwellings, calculations have been undertaken based on typical 'sound exposure levels' (SEL/L_{AE}) levels from vehicle activities that we have measured previously in car parks, as shown in Table 3.

Table 3: Summary of Measured Car Parking Noise at 10 metres (dB)

Description	L_{AE}
Car passby downhill	65
Door closure	70

- 4.4 L_{AE} is the total sound energy generated by one discrete noise event normalised to a 1 second duration. The approach of using SEL values for discrete events is useful since it allows calculation of 'equivalent continuous noise levels' ($L_{eq,T}$) over a longer period.
- 4.5 For a worst-case assessment, the noise levels outside the nearest dwellings generated by two separate scenarios have been calculated, i.e. six cars arriving in the morning before the school run and one car arriving late at night to begin a tour contract.
- 4.6 The equivalent continuous one-hour noise levels have been calculated from the L_{AE} values and uses the following formula:

$$L_{Aeq,1hr} = L_{AE} + 10 \log_{10} \left(\frac{N}{T} \right) - 20 \log_{10} \left(\frac{r}{10} \right)$$

where $L_{Aeq,T} = L_{Aeq,T}$ over time period T

$L_{AE \text{ average}}$ = 'Sound Exposure Level'

N = Number of events in time period T

T = Time period in seconds, (i.e. 3600s for a 1 hr period)

- 4.7 The resulting noise levels associated with the scenarios have been calculated outside the nearest dwellings with allowances for attenuation of sound over distance only. The results are shown in Table 4 below:

Table 4: Calculated Noise Levels from Car Parking at the nearest dwelling (dB)

Scenario	$L_{Aeq,1hr}$
Six cars parking in the morning	43
One car parking late at night	35

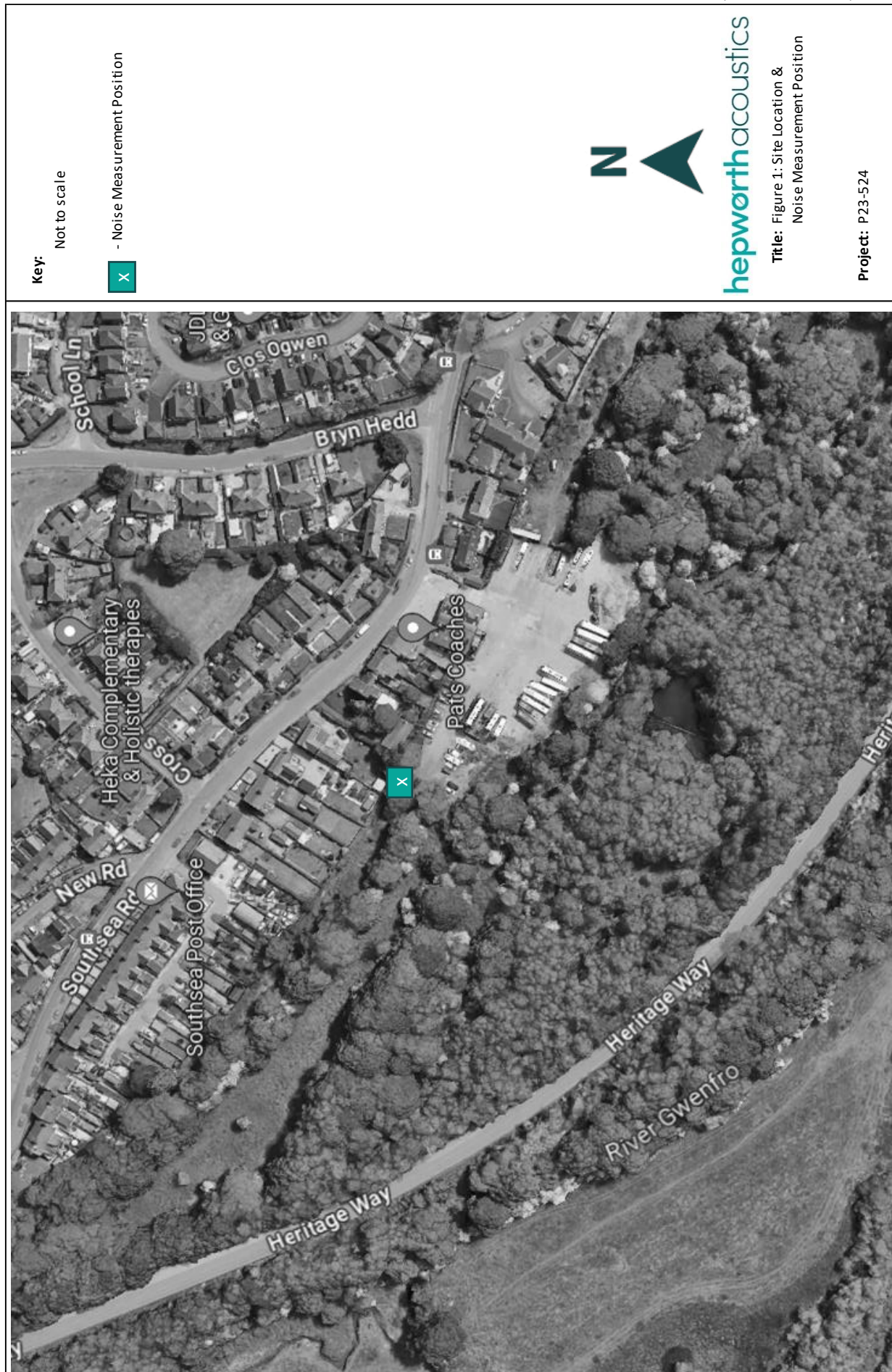
- 4.8 The predicted noise levels associated with use of the car park are low. The calculated car parking noise levels are below the ambient noise levels measured during the potential peak hours of use (i.e. 06:00 to 07:00 hours) before a school run. Although, the ambient noise levels reduce at night, the potential noise impact from one car movement results in much lower noise levels at the dwellings and again below the existing ambient noise level.

Conclusion

- 4.9 The assessment concludes that potential noise from staff car movements during the night-time period would not result in any unacceptable impact to residential amenity.
- 4.10 No mitigation measures are necessary to control the noise impact.

5.0 SUMMARY

- 5.1 The impact of noise from staff car movements has been assessed for Pat's Coaches, Southsea Road, Wrexham.
- 5.2 The potential noise impact has then been assessed in terms of noise from staff car movements during the night-time period.
- 5.3 Based on the outcome of the assessment, low noise levels were calculated outside the nearest dwelling,s which has been demonstrated that residential amenity is protected.



Appendix I: Noise Units & Indices

Sound and the decibel

A sound wave is a small fluctuation of atmospheric pressure. The human ear responds to these variations in pressure, producing the sensation of hearing. The ear can detect a very wide range of pressure variations. In order to cope with this wide range of pressure variations, a logarithmic scale is used to convert the values into manageable numbers. Although it might seem unusual to use a logarithmic scale to measure a physical phenomenon, it has been found that human hearing also responds to sound in an approximately logarithmic fashion. The dB (decibel) is the logarithmic unit used to describe sound (or noise) levels. The usual range of sound pressure levels is from 0 dB (threshold of hearing) to 120dB (threshold of pain).

Due to the logarithmic nature of decibels, when two noises of the same level are combined together, the total noise level is (under normal circumstances) 3 dB(A) higher than each of the individual noise levels e.g. 60 dB(A) plus 60 dB(A) = 63 dB(A). In terms of perceived 'loudness', a 3 dB(A) variation in noise level is a relatively small (but nevertheless just noticeable) change. An increase in noise level of 10 dB(A) generally corresponds to a doubling of perceived loudness. Likewise, a reduction in noise level of 10 dB(A) generally corresponds to a halving of perceived loudness.

The ear is not equally sensitive to sound at all frequencies. It is less sensitive to sound at low and very high frequencies, compared with the frequencies in between. Therefore, when measuring a sound made up of different frequencies, it is often useful to 'weight' each frequency appropriately, so that the measurement correlates better with what a person would actually hear. This is usually achieved by using an electronic filter called the 'A' weighting, which is built into sound level meters. Noise levels measured using the 'A' weighting are denoted dB(A) or dBA.

Frequency and Hertz (Hz)

As well as the loudness of a sound, the frequency content of a sound is also very important. Frequency is a measure of the rate of fluctuation of a sound wave. The unit used is cycles per second, or hertz (Hz). Sometimes large frequency values are written as kiloHertz (kHz), where 1 kHz = 1000 Hz.

Young people with normal hearing can hear frequencies in the range 20 Hz to 20 kHz. However, the upper frequency limit gradually reduces as a person gets older.

Glossary of Terms

When a noise level is constant and does not fluctuate, it can be described adequately by measuring the dB(A) level. However, when the noise level varies with time, the measured dB(A) level will vary as well. In this case it is therefore not possible to represent the noise climate with a simple dB(A) value. In order to describe noise where the level is continuously varying, a number of other indices can be used. The indices used in this report are described below.

$L_{Aeq,T}$ This is the A-weighted 'equivalent continuous noise level' which is an average of the total sound energy measured over a specified time period. In other words, $L_{Aeq,T}$ is the level of a continuous noise which has the same total (A-weighted) energy as the real fluctuating noise, measured over the same time period. It is increasingly being used as the preferred parameter for all forms of environmental noise.

L_{AFmax} This is the maximum A-weighted noise level that was recorded during the measurement period in terms of 'Fast' time weighting.

L_{AE} This is the A-weighted 'Sound Exposure Level' which is used for measuring discrete noise events. Essentially it is a measure of the sound energy of the whole noise event normalised to a period of 1 second. The SEL value can be used to calculate the actual L_{Aeq} value for a given time period if the number of noise events is known.

Appendix II: Noise Survey Results

Date(s):	Monday 15 to Tuesday 16 January 2024
Equipment	NTi XL2 'Class 1' sound level meters (s/n: A2A-20259-E0) with associated calibrator and environmental outdoor monitoring kit
Weather	Dry, -2 to 3°C, clear skies and calm <3 m/s

All levels in dB(A)

Location : To the rear of dwellings on Southsea

