

NET WORLD SPORTS, BRYN LANE, WREXHAM

NOISE IMPACT ASSESSMENT

On behalf of:
Net World Sports

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NOISE IMPACT ASSESSMENT

Report prepared by:
Hepworth Acoustics Ltd
21 Little Peter Street
Manchester
M15 4PS

On behalf of:
Net World Sports

Report prepared by:
David Thurstan BSc MIOA - Senior Consultant



Report checked by:
Paul Bassett BSc MSc FIOA – Technical Director



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1.0 INTRODUCTION

- 1.1 Hepworth Acoustics Ltd was commissioned by Net World Sports, to carry out a noise assessment in relation to Condition 8 of planning permission for B8 use class warehouse and associated infrastructure at land south of Ridleywood Lane and east of Bryn Lane, Wrexham. Condition 8 states:

“8. No development shall be commenced until a scheme has been submitted to and approved in writing by the local planning authority to ensure that the rating level of any noise generated by reason of this development shall not exceed the permissible boundary noise levels specified in Table 3.8 of the report by Royal Haskoning titled 'Bryn Lane Wrexham: Air Quality, Noise and Vibration Assessment reference 9X0457' at any time. Measurements and an assessment shall be made in accordance with BS 4142:1997 Method for Rating Industrial Noise Affecting Mixed Residential and Industrial Areas. The development shall only be carried out in accordance with the approved scheme.

- 1.2 However, the planning condition is based on a noise assessment report which is more than nine years old. That report, and the resulting planning condition for control of operational noise, refers to a British Standard which was formerly withdrawn and superseded in 2014 and thus recommends inappropriate noise limits at the site boundary. This report seeks to discharge Condition 8, based on an updated and revised noise assessment. Therefore, we propose to re-assess the potential noise impact to the latest version of the British Standard, based upon an updated baseline noise survey.
- 1.3 The location of the development site is shown in Figure 1. The nearest dwellings to the site are located to the northeast and east on Ridleywood Lane (approximately 200 metres from the nearest elevation of the proposed warehouse building) and the B5130 (approximately 250 metres from the nearest elevation of the warehouse building). To the west of the site on the other side of Bryn Lane are existing premises on the large Wrexham Industrial Estate.
- 1.4 The approved layout is for large warehouse building with a service yard to the south and car parking to the west and north. Vehicular access will be via Bryn Lane. A further service yard is proposed to the north, however access will be via a future link access road to the south. At this stage this service yard is not considered further in this assessment. The unit will cover a total 38,112 sq.m gross floor area. The southern elevation will have a number of dock loading bays for HGVs and trailer parking bays. We understand that the building will be a standard portal frame construction with profiled cladded wall and roof panels. The proposed site layout is shown in Figure 2.

- 1.5 Net World Sports propose to operate the site 08:00 to 20:00 hours Monday to Friday and also on Saturday mornings. Nevertheless, it is possible that future tenants could operate over the whole 24 hour period.
- 1.6 The noise assessment has included:
- An inspection of the site and surrounding area;
 - Measurement of existing background/ambient noise levels at a location representative of the nearest dwellings;
 - Calculation of potential noise levels from use of the site outside the nearest dwellings; and
 - If necessary, recommendation of appropriate noise mitigation measures.
- 1.7 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 NOISE ASSESSMENT CRITERIA

TAN 11

- 2.1 Planning guidance for potential noise generating developments in Wales is set out in Planning Guidance (Wales), Technical Advice Note (Wales) 11 – Noise, 1997 and subsequent CL-01-15 Updates to TAN 11, published in 2015. Those documents require potential noise from industrial and commercial developments in Wales to be assessed taking account of the relevant guidance in British Standard 4142. The latest version of that standard is described below.

BS 4142

- 2.2 British Standard 4142:2014+A1:2019, 'Methods for rating and assessing industrial and commercial sound' is the appropriate guidance for assessing the potential noise impact at residential locations from commercial sources. Thus, in terms of identifying appropriate noise design limits and any necessary noise mitigation measures for the approved units as required by planning Condition 8, BS 4142 is the relevant standard to refer to for guidance.
- 2.3 BS 4142 requires a 'rating' level ($L_{Ar,Tr}$) calculated from the operation of the noise source to be compared with the background sound level (L_{A90}) which is measured in the absence of the noise source. The noise is evaluated over a 1-hour period for daytime operations (i.e. 07:00 - 23:00 hours) and 15-minute period for night-time operations (i.e. 23:00 - 07:00 hours).
- 2.4 The rating level ($L_{Ar,Tr}$) is based on the 'specific' sound level ($L_{Aeq,Tr}$) attributed to the operating noise source, with 'character corrections' added for sound sources where 'certain acoustic features can increase the significance of impact'.
- 2.5 The acoustic character correction applied to the specific sound level in order to obtain the rating level can take into account tonality, intermittency, impulsivity and characteristics otherwise distinctive against the prevailing noise climate in the area.
- 2.6 An initial estimate of the potential noise impact from the operating noise source is determined by comparing the difference between the background level and the rating level.
- 2.7 Regarding the outcome of the initial estimate, BS 4142 states that:
- Typically, the greater this difference, the greater the magnitude of impact;

- A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context;
- A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context; and,
- The lower the rating level is relative to the measured background level, the less likely it is that the operation will have an adverse impact or a significant adverse impact. Where the rating level is does not exceed the background sound level, this is an indication of the specific sound source having low impact, depending on the context.

2.8 BS 4142 also states in respect of background sound levels that *"it is important to ensure that values are reliable and suitably represent the particular circumstances and periods of interest... the objective is not simply to ascertain a lowest measured background sound level, but rather to quantify what is typical during particular time periods"*.

2.9 BS 4142 states that it may be appropriate to modify the findings of the initial assessment to take account of contextual factors. In such cases all pertinent factors must be taken into account regarding the context in which the noise occurs, including but not limited to:

- The absolute level of sound.
- The character and level of the residual sound compared to the character of the specific sound; and,
- The sensitivity of the receptor and whether dwellings or other premises used for residential purposes will incorporate design measures that ensure good internal and/or outdoor acoustic conditions such as acoustic screening.

2.10 The initial numerical assessment and the context are then both taken into account when determining the potential noise impact.

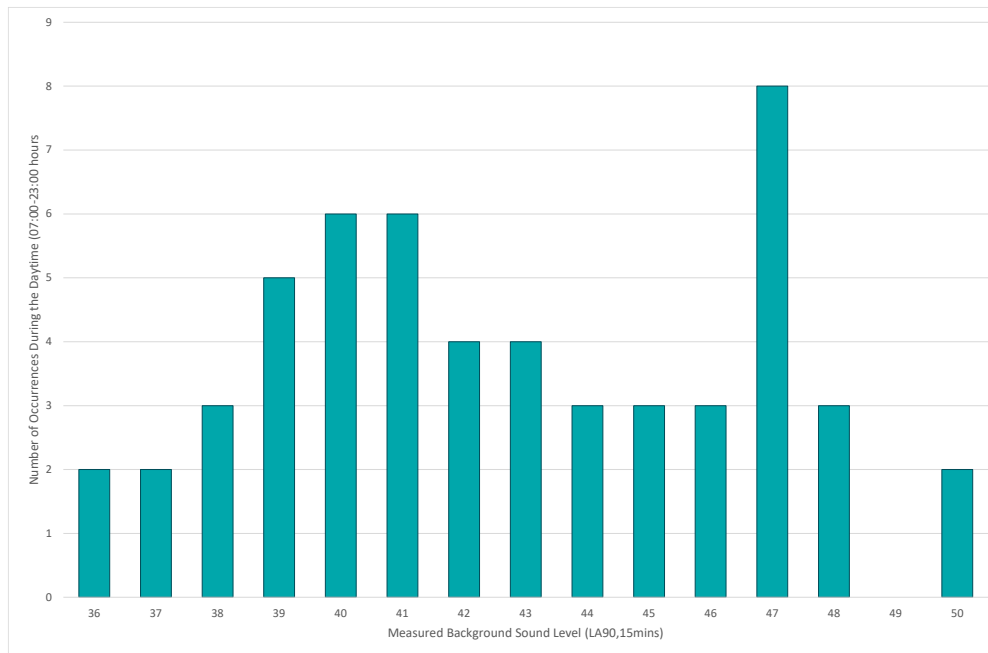
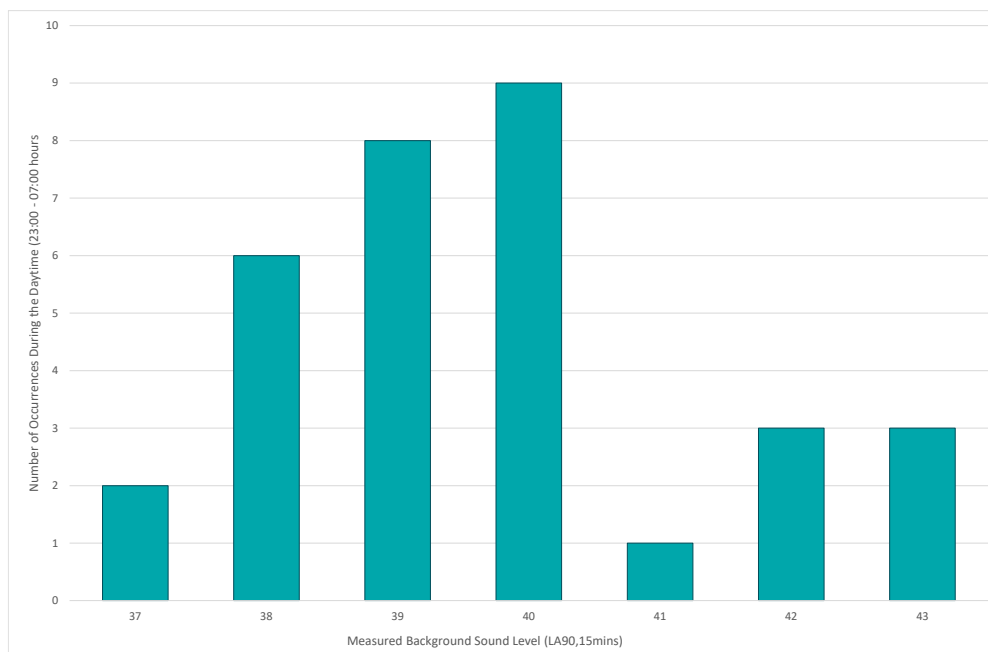
3.0 UPDATED BACKGROUND NOISE SURVEY

- 3.1 Noise levels were measured at a location on the eastern boundary of the site, representative of the nearest residential properties to the premises (i.e. dwellings on Ridleywood Lane and the B5130). The measurement location is shown in Figure 1.
- 3.2 The purpose of the noise survey was to establish the currently prevailing ambient/background noise climate of the area.
- 3.3 The noise measurements were undertaken by installing an automatic data-logging sound level meter. The survey was carried out in terms of a series of consecutive 15-minute measurements from Tuesday 6 to Wednesday 7 April 2021. The noise measurements were taken in 'free-field' conditions and at a microphone height of approximately 1.4m above the ground. Calibration checks were carried out both before and after the measurement periods with no variance in levels noted.
- 3.4 The weather conditions during the noise survey were suitable for the purposes of the survey and subsequent assessment.
- 3.5 The results of the noise survey are summarised in Table 1, and the full results along with details of the equipment used, and the weather conditions during the survey periods, are shown in Appendix II.

Table 1: Summary of measured noise levels (dB)

Period	<i>L</i> _{Aeq,15 mins}	<i>L</i> _{A90,15 mins}
Daytime (07:00 – 23:00 hours)	41 – 56	36 – 50
Night-time (23:00 – 07:00 hours)	39 – 49	37 – 43

- 3.6 Noise levels were due to distant road traffic on the local roads and birdsong.
- 3.7 We have carried out a modal analysis of the measured background sound levels as shown in Graph 1 as a means of determining the representative background sound level at the nearest dwellings.

Graph 1 - Background Sound Levels during Daytime Hours**Graph 2 - Background Sound Levels during Night-time Hours**

3.8 From the graph, and the guidance within BS 4142, the daytime modal value is 47 dB, however there are other modes within the dataset and therefore for the purposes of this assessment we have adopted the mean of these three modal values which is 43 dB $L_{A90,T}$. The mode value of 40 dB $L_{A90,T}$ as the representative background sound level outside the nearest dwellings for the night-time period.

4.0 ASSESSMENT & CONTROL OF NOISE IMPACT

Operating Noise Limit

- 4.1 To adequately control noise from the approved development at the nearest dwellings, we recommend that the BS 4142 rating level from all combined sources of noise on the development site must be controlled to be no higher than the representative background sound levels in the daytime and at night, as adopted in Section 3 of this report.

Assessment of Yard Activities

- 4.2 The warehouse building will have dock loading bays such that all lorries will be loaded/unloaded from within the building. Thus the only significant potential noise generated on-site by the development will be from movements of HGVs within the service yard.
- 4.3 Although Net World Sports are the current tenant, it is possible that future tenants will operate over the whole 24 hour period. Crowd Dynamics prepared a transport assessment as part of the original outline planning application (dated October 2011) based on a total gross floor area of 50,000sq.m and the proposed B2 and B8 uses.
- 4.4 Based on the predicted 2025 traffic data from the report the possible HGV traffic flows for the development are reproduced in Table 2 below. The peak hour of activity has also been included.

Table 2: Estimated HGV Traffic Flows Associated with the Proposed Use

Period	Traffic Flow
Daytime 18 hour (06:00 – 00:00)	143
Night-time 8 hour (22:00 – 06:00)	52
Peak Hour (07:30 – 08:30)	10

- 4.5 The total daytime flow for HGV movements would equate to 8 vehicle movements an hour and total night-time HGV flow would be 6 vehicles in one hour or 2 in a 15 minute period. For the purposes of this assessment the daytime period is considered to be 07:00 to 23:00 hours and 23:00 to 07:00 hours for night, in line with BS 4142.
- 4.6 Heavy Goods Vehicles will enter the site from Bryn Lane (i.e. from the west away from the nearest dwellings). The vehicles will manoeuvre within the yard area approximately 300 metres from the rear of the dwelling to the east and approximately 370 metres from the dwelling to the northeast off

Ridleywood Lane. The dwelling to the northeast of the site will be screened from vehicle movements in the service yard by the warehouse building itself.

- 4.7 Calculations of the potential noise from vehicle movements in the service yard have been carried out using source noise measurements previously measured by Hepworth Acoustics in connection with similar developments.
- 4.8 Source noise levels measured included noise from vehicle movements (HGVs) and other service yard activities. The noise levels have been measured in terms of the sound exposure level, L_{AE} for individual events or tasks. Based on the peak hour indicated in the transport assessment the anticipated number of vehicle movements, the resulting $L_{Aeq,T}$ values have been calculated. The measured service yard source noise levels used in the assessment are summarised in Table 3.

Table 3: Summary of Measured Source Noise Levels at 5 metres

Source	L_{AE} (dB)
HGV moving forward	82
HGV reversing (inc. reverse warning alarm)	88

- 4.9 We have calculated likely levels of noise outside the nearest dwellings generated by HGV movements in the yard in a 1 hour assessment period during daytime hours. The calculations consider attenuation of sound over distance and noise screening attenuation where appropriate (i.e. from intervening buildings).
- 4.10 We have calculated likely levels of noise in the gardens of the nearest dwellings generated by HGVs in the service yard on the basis of ten (i.e. the peak hour value) HGVs arriving, unloading and leaving in a 1 hour period during the daytime. Also, noise levels have been calculated outside a first floor window of the nearest dwellings on the basis of two HGV arriving/leaving in a 15 minute period at night.
- 4.11 The nearest dwellings are some distance from the proposed activities, therefore it is unlikely that any acoustic characteristics would be discernible at these locations. Nevertheless, due to the intermittent nature of the loading/unloading activities a 3 dB acoustic feature penalty has been applied. An initial assessment of the potential noise impact of the yard activity sound levels are set out in Tables 4 and 5.

Table 4: BS 4142 Assessment of yard activities at the dwelling to the east (dB)

Description	Daytime	Night-time
Calculated Specific Sound Level Outside Dwelling	28	27
Acoustic feature correction	+3	+3
Rating Level at Dwelling	31	30
Representative Background Sound Level	43	40
Difference	-12	-10
Initial estimate	'low' impact	'low' impact

Table 5: BS 4142 Assessment of yard activities at the dwelling to the northeast (dB)

Description	Daytime	Night-time
Calculated Specific Sound Level Outside Dwelling	18	18
Acoustic feature correction	+3	+3
Rating Level at Dwelling	21	21
Representative Background Sound Level	43	40
Difference	-22	-19
Initial estimate	'low' impact	'low' impact

- 4.12 The calculated rating levels from yard activities are 12 dB and 22 dB below the representative daytime background sound level at the nearest dwellings. The calculated rating levels from yard activities are 10 dB and 19 dB below the representative night-time background sound level at the nearest dwellings. In terms of the initial BS 4142 assessment this indicates a 'low' impact. There is no need to modify the findings of the initial assessment.

- 4.13 It is understood that Net World Sports propose to operate 08:00 to 20:00 hours Monday to Friday and Saturday mornings, with fewer vehicle movements. We therefore conclude that there will be no unacceptable noise impact from use of the warehouse service yard.

Planning Condition

- 4.14 In order to discharge planning condition 8, the following approach and noise limits should be adhered to:

“Noise arising from activities carried out on the site shall not exceed noise rating levels outside residential properties of:

43 dB $L_{Ar,1hr}$ between 07:00 & 23:00 hours; and

40 dB $L_{Ar,15mins}$ between 23:00 & 07:00 hours

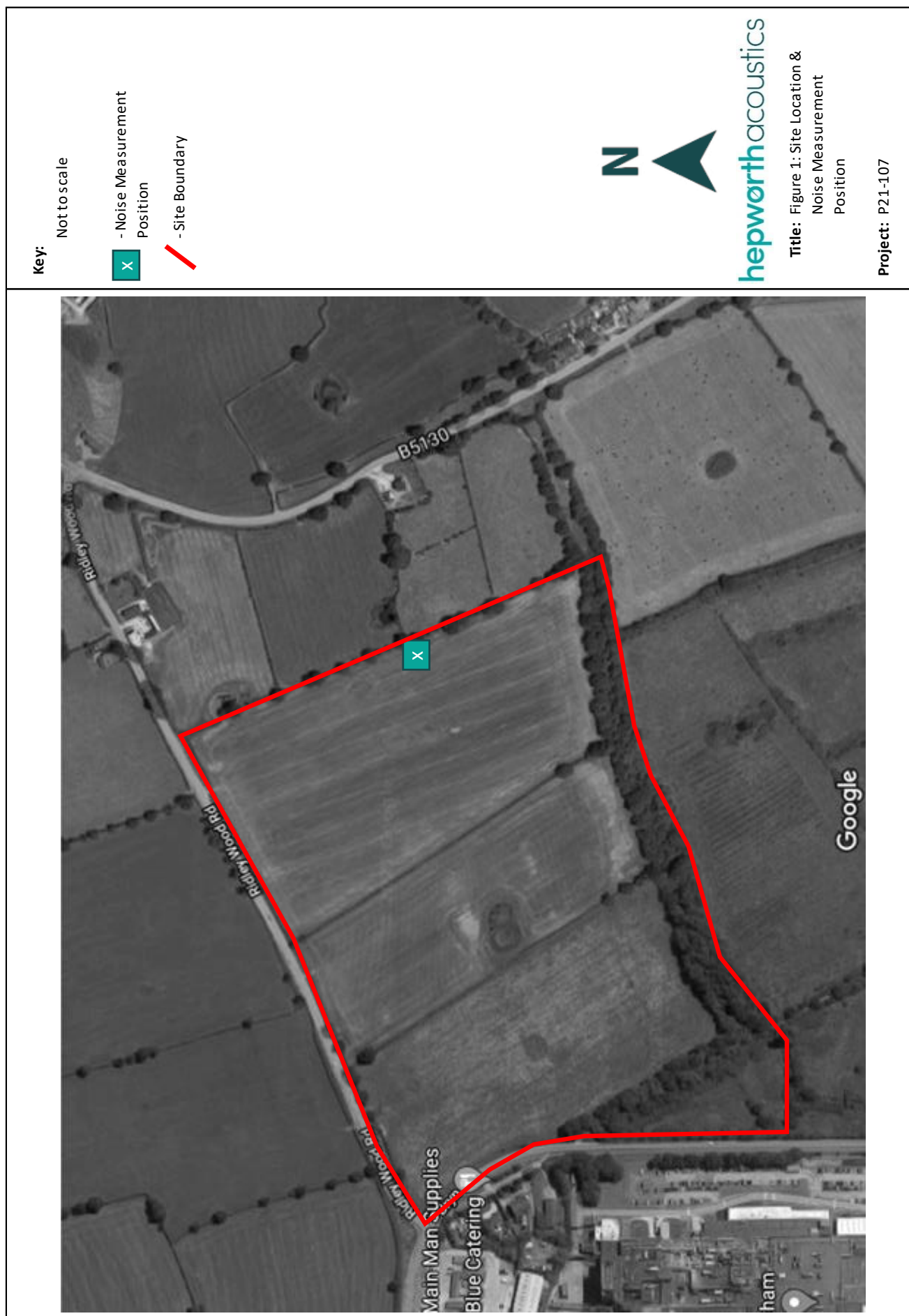
both determined by measurement or calculation in accordance with BS 4142:2014+A1:2019”

Conclusion

- 4.15 Subject to the operating noise limits recommended above we conclude that potential noise impact from operation of the proposed development will not result in any unacceptable harm to residential amenity by reason of noise disturbance.

5.0 SUMMARY

- 5.1 Hepworth Acoustics Ltd was commissioned by Net World Sports, to carry out a noise impact assessment in connection with a discharge of condition application for Condition 8 of the planning permission for the Net World Sports, Bryn Lane, Wrexham.
- 5.2 We understand there is an opportunity to discharge the noise condition (Condition 8), based on an updated and revised noise assessment. Therefore, we have re-assessed the noise impact to the latest British Standard.
- 5.3 This assessment has involved carrying out an updated baseline noise monitoring survey over a 24 hour period and evaluating potential noise impacts associated with the proposals.
- 5.4 We have recommended appropriate operating noise limits based upon the background noise climate of the area and the methodology of BS 4142. We have demonstrated by calculations that use of the site by Net World Sports can take place within these operating noise limits.
- 5.5 No mitigation measures are required to control noise, however the proposed operating noise limits should be adhered to which will ensure the protection of the amenity of local residents.



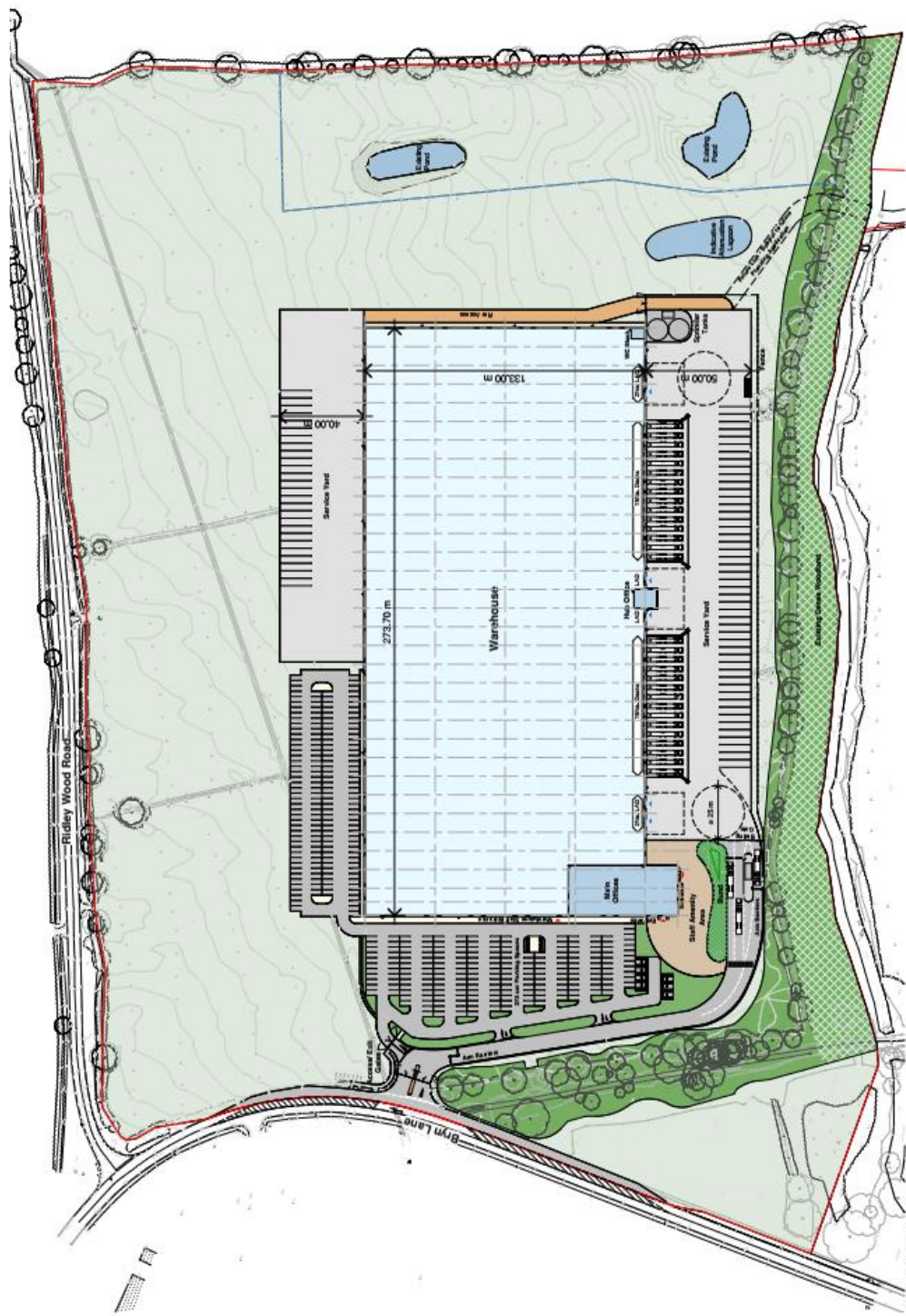
Key: Not to scale



hepworthacoustics

Title: Figure 2: Site Layout

Project: P21-107



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} 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.

$L_{Amax,F}$ This is the maximum A-weighted noise level that was recorded during the monitoring period.

$L_{A90,T}$ This is the A-weighted noise level exceeded for 90% of the time period. L_{A90} is used as a measure of background noise.

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 L_{AE} 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): Tuesday/Wednesday 6/7 April 2021

Equipment: Rion NL-52 'Class 1' sound level meter (serial no. 00242747) with calibrator and environmental kit, pole and windshield

Weather: Dry, mild (~7-9°C) with 30% cloud cover and an occasional north-westerly breeze (<5 m/s)

All levels in dB(A)

Location : Eastern Boundary

