

NEW BUILDING AT RHODES BUSINESS PARK, MIDDLETON

NOISE IMPACT ASSESSMENT

On behalf of:

OLF1 PROPCO2 S.A.R.L

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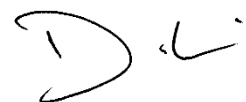
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1.0 INTRODUCTION

- 1.1 Hepworth Acoustics Ltd was commissioned by OLF1 PROPCO2 S.A.R.L to carry out a noise impact assessment in connection with a proposed planning application for a new industrial building at Rhodes Business Park, Middleton.
- 1.2 The location of the proposed development, which is currently used as a car and trailer park, is shown in **Figure 1**. It is understood that the building will be formed of metal clad portal frame structure consisting of an area of 17,000 sqft for B2, B8 & E(g) use. The site is bounded by Old Manchester to the north and the M60 to the south and both extend far to the east and west. The nearest dwelling is situated on Old Manchester Road as shown in **Figure 1**.
- 1.3 The assessment has been based on the layout shown on drawing '*4694-001-P01 Proposed Site Plan*' as provided by Emery Planning dated September 2023. The proposed layout of the development is shown in **Figure 2**. No tenant is yet confirmed for the development and so no details of proposed operations at the site are available at this stage.
- 1.4 The noise assessment has therefore included:
- An inspection of the site and surrounding area;
 - Measurement of baseline noise levels during a 24-hour period;
 - Determining appropriate noise limits for the development in order to protect the amenity of residents of the nearest/most exposed dwellings; and
 - Providing outline guidance on the implications of the noise limits in respect of typical commercial operations that might be expected at the site.
- 1.5 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

BS 4142:2014+A1:2019

- 2.1 British Standard 4142:2014+A1:2019, *Methods for rating and assessing industrial and commercial sound* (referred to hereafter as BS 4142), is the appropriate guidance for assessing and controlling the noise impact at residential locations from noise sources such as mechanical services plant installations.
- 2.2 BS 4142 requires a 'rating' level ($L_{Ar,Tr}$) to be calculated from the operation of the noise source and compared with the background sound level ($L_{A90,T}$) which is measured in the absence of the noise source, evaluated over a 1-hour period for daytime operations and a 15-minute period for night-time operations.
- 2.3 In respect of the representative background sound level, BS 4142 states that 'the objective is not simply to ascertain a lowest measured background sound level, but rather to quantify what is typical during particular time periods'.
- 2.4 The rating level ($L_{Ar,Tr}$) is based on the 'specific' sound level ($L_s = L_{Aeq,Tr}$) attributed to the operating noise source, with 'character corrections' added for sound sources where 'certain acoustic features can increase the significance of impact' at the residential locations.
- 2.5 The 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 of the residential properties.
- 2.6 An initial estimate of the potential noise impact from the operating noise source is determined by comparing the difference between the background sound 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 the 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
- 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 does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

2.8 Where the initial estimate of the impact needs to be modified due to the context, BS 4142: 2014 states that all pertinent factors should 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.

2.9 For this development, we recommend that the rating level of noise from the site is controlled so as to be no higher than the representative background sound levels outside the nearest/most exposed dwellings.

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 north of the site on Old Manchester Road. The noise measurement location is shown in **Figure 1**.
- 3.2 An automated noise survey was carried out over a 24-hour period between approximately 14:00 on Monday 25 September and 14:00 on Tuesday 26 September 2023.
- 3.3 The noise measurements were taken in consecutive 15-minute periods in ‘free-field’ conditions with a NTi XL2 ‘Class 1’ sound level meter (s/n: A2A-20228-E0) with associated calibrator and environmental outdoor monitoring kit. The microphone was mounted onto a tripod at a height of approximately 1.4 metres above the ground in free-field conditions. 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. The results of the noise survey are summarised in **Table 1**, with the full results along with details of the equipment used and the weather conditions during the survey shown in **Appendix II**. Both the modal and average background sound levels have been considered for each period with the lowest value being adopted.

Table 1: Summary of representative daytime and evening sound levels (dB)

Description	Summary of Measured noise levels		
	Range of $L_{Aeq,T}$	Mean $L_{A90,15min}$	Mode $L_{A90,15min}$
Daytime period (07:00 – 19:00)	65 - 71	61	61
Evening Period (19:00 – 23:00)	61 - 66	55	57
Night-time (23:00 – 07:00)	54 - 67	50	46

- 3.5 Taking into account the results of the noise survey as summarised in **Table 1**, and accounting for the fact that the site could operate at night, we have adopted **61 dB $L_{A90,15min}$** , **55 dB $L_{A90,15min}$** and **46 dB $L_{A90,15min}$** as the representative background sound levels for the purposes of this assessment for the daytime, evening and night-time periods respectively. These are moderate noise levels.

4.0 ASSESSMENT

Noise Limits

4.1 Because no tenant is yet confirmed, the details of proposed operations and activities at the building are not known. Potential noise impact from the development can however be controlled by ensuring that appropriate noise limits are met outside the nearest dwellings.

4.2 Based upon the findings of the baseline noise survey and the guidance set out in BS 4142, the relevant noise limits for all site noise combined are as follows:

Table 2: Cumulative Site Noise Rating Level Limits (dB $L_{Ar,Tr}$)

Location	Day (07:00-19:00)	Evening (19:00 -23:00)	Night (23:00-07:00)
Outside nearest Dwelling	61	55	46

4.3 The need to ensure that the development does not result in any unacceptable noise impact can be secured by way of a suitably worded planning condition requiring all noise from the site combined to be controlled to within the noise limits set out in **Table 2** above.

4.4 For illustrative purposes only, we have carried out some outline calculations to determine the implications of the above noise limits.

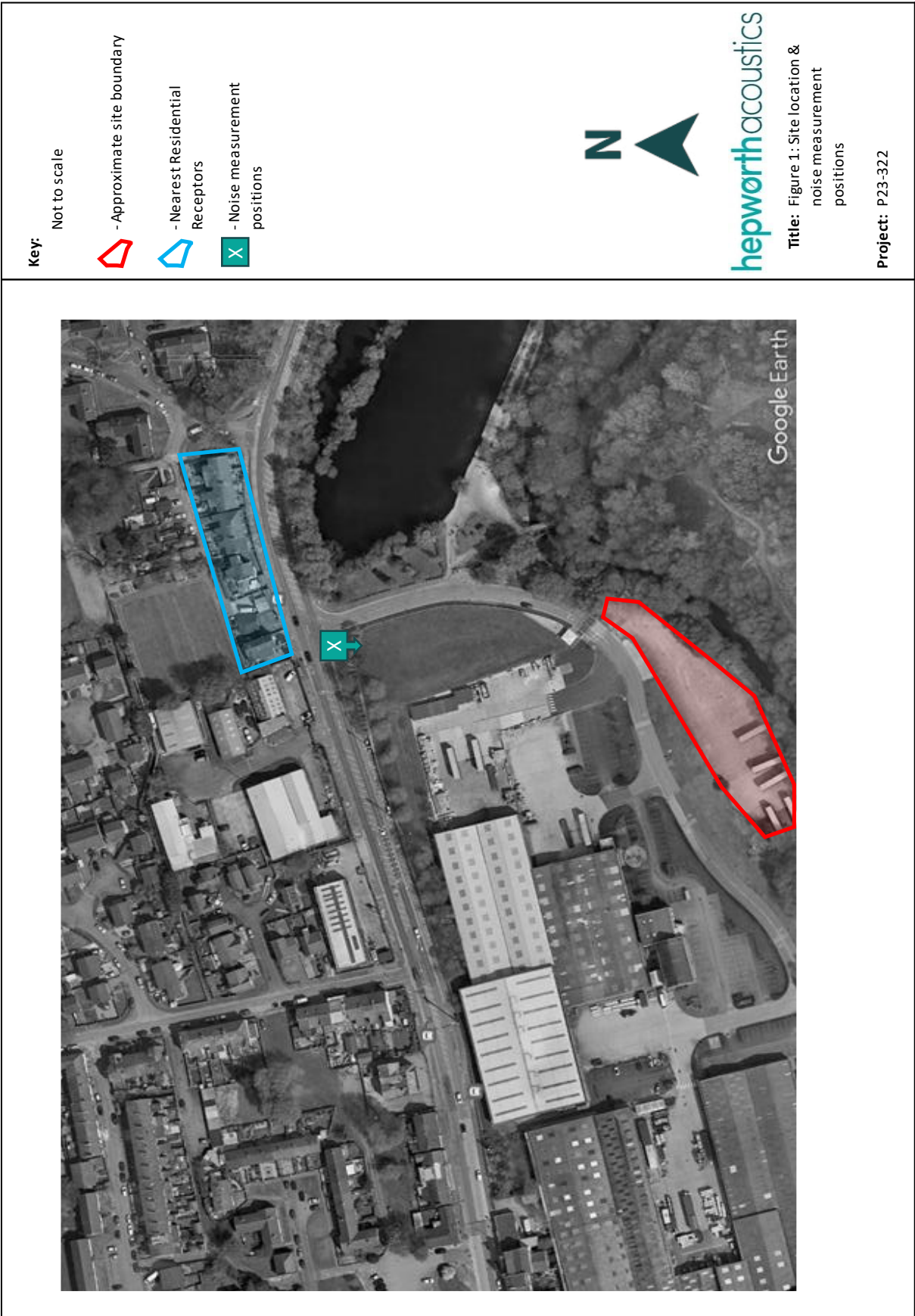
4.5 Based upon point source distance attenuation only (taking into account a separation distance of approximately 190m from the centre of the site to the nearest dwellings), we calculate that the noise limits are equivalent to combined source noise levels as follows:

- Daytime – 87 dB L_{Ar} at 10m
- Evening – 81 dB L_{Ar} at 10m
- Night-time – 72 dB L_{Ar} at 10m

4.6 These are high levels of noise which indicate that it should be straight-forward to meet the recommended noise limits.

5.0 SUMMARY & CONCLUSIONS

- 5.1 Hepworth Acoustics Ltd was commissioned by OLF1 PROPCO2 S.A.R.L to carry out a noise impact assessment in connection with a proposed planning application for a new building at Rhodes Business Park, Middleton. No tenant is confirmed at this stage.
- 5.2 The assessment has included a site visit and inspection of the proposed development land and the surrounding area; and a noise survey over a 24-hour period in order to quantify the representative background noise climate of the area.
- 5.3 The results of the noise survey have been used as a basis for determining appropriate noise limits for the development. The need to ensure that the development does not result in any unacceptable noise impact can be secured by way of a suitably worded planning condition requiring all noise from the site combined to be controlled to within the recommended noise limits.
- 5.4 Outline calculations have indicated that it should be straight-forward to control noise from the development to within the relevant noise limits.





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.

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

Appendix II: Noise Survey Results

Date(s):	Daytime – Monday 25 September 2023 Night-time – Monday 25 September 2023
Equipment	NTi XL2 'Class 1' sound level meters (s/n: A2A-20228-E0) with associated calibrator and environmental outdoor monitoring kit
Weather	Daytime – Dry, ~19°C, clear skies and calm <3 m/s Night-time – Dry, ~14°C, clear skies and calm <3 m/s

Please see chart overleaf.

