



ACOUSTIC
CONSULTANTS LTD

Noise Impact Assessment

**Proposed Industrial Units
Old Foundry Road, Pontardawe**

Reference: 10286/BL

Client:

Bluefield Land Limited

Document Control

Version:	Revision Description:	Date:	Author:	Reviewed by:	Approved by:
1.0	First Issue	05/06/23	Blake Lucas	Daniel Oldaker	Daniel Oldaker

The report has been prepared in good faith, with all reasonable skill and care, based on information provided or available at the time of its preparation and within the scope of work agreement with the Client. We disclaim any responsibility to the Client and others in respect of any matters outside the scope of the above. The report is provided for the sole use of the named Client and is confidential to them and their professional advisors. No responsibility is accepted to other parties.

The report limits itself to addressing solely on the noise, acoustic, and vibration aspects as included in this report. We provide advice only in relation to noise, vibration and acoustics. It is recommended that appropriate expert advice is sought on all the ramifications (e.g. CDM, structural, condensation, fire, legal, etc.) associated with any proposals in this report or as advised and concerning the appointment. It should be noted that noise predictions are based on the current information as we understand it and, on the performances noted in this report. Any modification to these parameters can alter the predicted level. All predictions are in any event subject to a degree of tolerance of normally plus or minus three decibels. If this tolerance is not acceptable, then it would be necessary to consider further measures.

Table of Contents

1.	Introduction	4
2.	The Site	5
3.	Planning & Noise	6
4.	Assessment Methodology	10
5.	Baseline Noise Monitoring	12
6.	Operational Noise Modelling	15
7.	Operational Noise Limits	19
8.	Summary & Conclusions	20
9.	Appendix 1 – Glossary of Acoustic Terminology	21

1. Introduction

Bluefield Land Limited appointed Acoustic Consultants Ltd to undertake a noise impact assessment in relation for the proposed light industrial units.

The report presides the results of a baseline survey, identifies relevant planning and noise guidance, sets noise limits for the use of the industrial units. The report also provides an assessment of the potential delivery noise from the use.

The noise impact assessment has been undertaken in accordance with the guidance in the Planning Policy Wales, TAN11 and British Standard 4142:2014+A1:2019 (BS4142).

The author of this report is a Member of the Institute of Acoustics (MIOA) with an acoustics qualification and over 15 years' experience.

3. Planning & Noise

3.1. Planning Policy Wales

Planning Policy Wales (PPW) Edition 11 dated February 2021 sets out the land use planning policies of the Welsh Government. Section 1 states:

"1.1 Planning Policy Wales (PPW) sets out the land use planning policies of the Welsh Government. It is supplemented by a series of Technical Advice Notes (TANs), Welsh Government Circulars, and policy clarification letters, which together with PPW provide the national planning policy framework for Wales. PPW, the TANs¹, MTANs² and policy clarification letters comprise national planning policy. "

The most relevant statements for noise affecting a residential use are provided in Section 6.7 and summarised below:

"6.7.1 Clean air and an appropriate soundscape, contribute to a positive experience of place as well as being necessary for public health, amenity and well-being. They are indicators of local environmental quality and integral qualities of place which should be protected through preventative or proactive action through the planning system. Conversely, air, noise and light pollution can have negative effects on people, biodiversity and the resilience of ecosystems and should be reduced as far as possible."

6.7.4 The planning system should maximise its contribution to achieving the well-being goals, and in particular a healthier Wales, by aiming to reduce average population exposure to air and noise pollution alongside action to tackle high pollution hotspots. In doing so, it should consider the long-term effects of current and predicted levels of air and noise pollution on individuals, society and the environment and identify and pursue any opportunities to reduce, or at least, minimise population exposure to air and noise pollution, and improve soundscapes, where it is practical and feasible to do so.

6.7.5 In taking forward these broad objectives the key planning policy principle is to consider the effects which proposed developments may have on air or soundscape quality and the effects which existing air or soundscape quality may have on proposed developments. Air Quality and soundscape influence choice of location and distribution of development and it will be important to consider the relationship of proposed development to existing development and its surrounding area and its potential to exacerbate or create poor air quality or inappropriate soundscapes. The agent of change principle says that a business or person responsible for introducing a change is responsible for managing that change.

In practice, for example, this means a developer would have to ensure that solutions to address air quality or noise from nearby pre-existing infrastructure, businesses or venues can be found and implemented as part of ensuring development is acceptable.

6.7.6 In proposing new development, planning authorities and developers must, therefore:

- address any implication arising as a result of its association with, or location within, air quality management areas, noise action planning priority areas or areas where there are sensitive receptors;*
- not create areas of poor air quality or inappropriate soundscape; and*
- seek to incorporate measures which reduce overall exposure to air and noise pollution and create appropriate soundscapes.*

6.7.7 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 air quality and noise assessment to be undertaken by a suitably qualified and competent person on behalf of the developer.

6.7.8 Good design, for example setting back buildings from roads to avoid canyon effects and using best practice in terms of acoustic design to ensure the appropriate and intended acoustic environment of completed developments should be incorporated at an early consideration in the design and planning process. Other mitigation measures must be capable of being effectively implemented for their intended purpose, and could include those related to:

- traffic management and road safety;*
- ensuring progress towards a shift to low or zero emissions means of road transport, such as electrical charging points;*
- supporting low or zero emissions public transport;*
- providing active travel infrastructure; and*
- incorporating green infrastructure, where it can improve air quality by removing air pollution and aiding its dispersal, reduce real or perceived noise levels by absorbing and scattering noise and introducing natural sounds to soften man-made noise, provide areas of relative tranquillity, and reduce exposure by putting a buffer between sources of pollution and receptors.*

6.7.14 Proposed development should be designed wherever possible to prevent adverse effects to amenity, health and the environment but as a minimum to limit or constrain any effects that do occur. In circumstances where impacts are unacceptable, for example where adequate mitigation is unlikely to be sufficient to safeguard local amenity in terms of air quality and the acoustic environment it will be appropriate to refuse permission. Location of Commercial, Industrial and other Potentially Polluting Development.

6.7.19 The health imperative of good air quality and appropriate soundscapes in contributing to the overall character and quality of places and the health and well-being of people and wildlife should be fully recognised.

It will not be appropriate to locate sensitive uses, such as hospitals, schools, care homes and housing adjacent to busy roads or other transport routes, where there are no connectivity benefits to be gained and where health and amenity impacts associated with increased exposure of people to pollution will be unacceptable. Whilst some uses may be appropriate with the aid of good design air quality and soundscape considerations can be overriding factors, especially for sensitive uses, if they cannot be adequately mitigated and impacts minimised.

6.7.20 Where sensitive developments need to be located close to existing transportation infrastructure for sustainable movement and access they should be designed, as far as practicable, to limit harmful substances and noise levels within and around those developments both now and in the future. This may include employing the principles of good acoustic design and the inclusion of active travel or travel management measures as part of development proposals. Such development, however, should preferably be located away from existing sources of significant noise, which may include aircraft noise or roads, particularly new roads or those with programmed route improvements.

6.7.21 Regard should be paid to current air quality and noise levels and the quality of the existing soundscape and account taken of any relevant local air quality action plan, noise action plan and/ or local or regional air quality strategy as part of development strategies and proposals in development plans and before determining planning applications. Soundscapes and Compatibility of Uses

6.7.24 The potential impacts of noise pollution arising from existing development, be this commercial, industrial, transport related or cultural venues (such as music venues, theatres or arts centres), must be fully considered to ensure the effects on new development can be adequately controlled to safeguard amenity and any necessary measures and controls should be incorporated as part of the proposed new development. This will help to prevent the risk of restrictions or possible closure of existing premises or adverse impacts on transport infrastructure due to noise and other complaints from occupiers of new developments. It will be important that the most appropriate level of information is provided and assessment undertaken."

PPW does not provide any quantifiable criteria and directs you to the Technical Advice Notes (TAN 11).

3.2. Technical Advice Note (Wales) - Noise

Planning Policy Wales (PPW) Edition 11 dated February 2021 sets out the land use planning policies of the Welsh Government. It is supplemented by a series of Technical Advice Notes.

The relevant planning criteria for proposed residential development is in Technical Advice Note (Wales) 11 entitled "Noise" which was published in October 1997. The introduction states: *"This note provides advice on how the planning system can be used to minimise the adverse impact of noise without placing unreasonable restrictions on development or adding unduly to the costs and administrative burdens of business. It outlines some of the main considerations which local planning authorities should take into account in drawing-up development plan policies and when determining planning applications for development which will either generate noise or be exposed to existing noise sources"*.

Paragraph 8, under the section entitled 'Noise generating development' within TAN11 states:

"Local planning authorities must ensure that noise generating development does not cause an unacceptable degree of disturbance. They should also bear in mind that if subsequent intensification or change of use results in greater intrusion, consideration should be given to the use of appropriate conditions."

With paragraph 9 continuing:

"Noise characteristics and levels can vary substantially according to their source and the type of activity involved. In the case of industrial development, for example, the character of the noise should be taken into account as well as its level. Sudden impulses, irregular noise or noise which contains a distinguishable continuous tone will require special consideration."

TAN11 does not provide assessment criteria in relation to industrial noise on its own. Instead, it directs the reader to British Standard 4142.

4. Assessment Methodology

For industrial and commercial noise, the most relevant guidance is provided within BS 4142:2014+A1:2019. This is an update to the version referred to in TAN11 and as such considered most relevant.

The principle is that of establishing the 'difference' between the 'rating level' and the 'background sound level'. The 'rating level' is the 'specific sound level' of the source over a period of one hour during the day (07:00 to 23:00 hours) and over a period of 15 minutes during the night (23:00 to 07:00 hours). Clause 9 entitled 'Rating Level' states:

"Certain acoustic features can increase the significance of impact over that expected from a basic comparison between the specific sound level and the background sound level. Where such features are present at the assessment location, add a character correction to the specific sound level to obtain the rating level."

An acoustic character correction should be added to the 'specific sound level' if it exhibits any tonality, impulsivity, other specific characteristics and/or intermittency at the assessment location. The value of the character correction varies, dependent on the prominence of the character of the sound source at the assessment location.

In Clause 11 of the Standard, entitled 'Assessment of the Impacts', it states:

"Obtain an initial estimate of the impact of the specific sound by subtracting the measured background sound level (see Clause 8) from the rating level (see Clause 9), and consider the following."

- *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 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 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."*

It should be noted that the numerical outcome only represents the initial estimate of impact, as stated in the first paragraph of Clause 11, and that contextual matters should be considered before determining what the potential impact is. This paragraph states:

The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs. An effective assessment cannot be conducted without an understanding of the reason(s) for the assessment and the context in which the sound occurs/will occur. When making assessments and arriving at decisions, therefore, it is essential to place the sound in context.

Obtain an initial estimate of the impact of the specific sound by subtracting the measured background sound level (see Clause [8](#)) from the rating level (see Clause [9](#)).

NOTE 1 More than one assessment might be appropriate.

The second part of Clause 11 sets out three contextual matters that should be taken into account once the initial numerical estimate has been determined. It is important to note that the three listed is not exhaustive and all pertinent factors should be considered.

5. Baseline Noise Monitoring

A baseline noise survey was completed for the former application on the site of residential use. We consider this baseline noise data still relevant for this new application.

5.1. Monitoring Equipment

Sound Pressure Levels were measured using Class 1 sound level meters with half-inch condenser microphones, using the 'fast' setting. The equipment is checked annually using a Quality System meeting the requirements of British Standard EN ISO/IEC 17025:2005 and in accordance with British Standard EN 10012:2003 and traceable to the National Standards. This equipment was checked and calibrated as noted below and the certificates are available for inspection.

Table 1: Equipment and Calibration Status

Equipment Description / Manufacturer / Type	Serial Number	Date of Calibration	Calibration Certification Number
SLM, Cirrus Research, CR:171C	G071684	12/04/2019	269982
Microphone, Cirrus Research, MK224	606369B	12/04/2019	129307
Calibrator, Cirrus Research, CR:515	73217	12/04/2019	128101
SLM, Cirrus Research, CR:171C	G079832	22/10/2018	264737
Microphone, Cirrus Research, MK224	209563D	22/10/2018	123040
Calibrator, Cirrus Research, CR:515	80569	22/10/2018	123039

The measurement systems were checked before and after use with the calibrators and no significant drift was detected.

5.2. Weather Conditions

During the measurements the weather was dry with an average temperature of approximately 25 degrees Celsius, an average wind speed of 1 metres per second and clear sky. These weather conditions are not expected to have adversely affected the measured noise data.

5.3. On Site Monitoring

Noise monitoring was undertaken over a 24 hour period. The monitoring was undertaken at 4 locations across the site and area. Location A was over 24 hours, Locations B-D were fully attended short term measurements. At all positions the microphone was 1.5-2m above the site level and in a free-field location.

Location A is considered most relevant for this new development of light industrial use and is considered in detail here.

The main source of noise affecting the site is industrial plant noise (Wall Colmonoy), delivery process from Lliw Building Supplies and council vehicles from their depot during the day, at night the main noise source is distant road traffic and also plant noise (Wall Colmonoy).

The source and monitoring locations are as indicated on the figure below.

Figure 2: Monitoring and Source locations



5.4. Measured Noise Levels

The monitoring at Location A was undertaken unattended over 24 hours. The main source of noise affecting this location is industrial plant noise (Wall Colmonoy), with some contribution from the delivery process from Lliw Building Supplies. It should be noted that there was a delivery to Wall Colmonoy during the survey, this delivery was not audible at the development site.

A chart of the variation in ambient noise levels with time is provided below for monitoring location A:

Chart 1: Measured Noise Levels at Monitoring Location

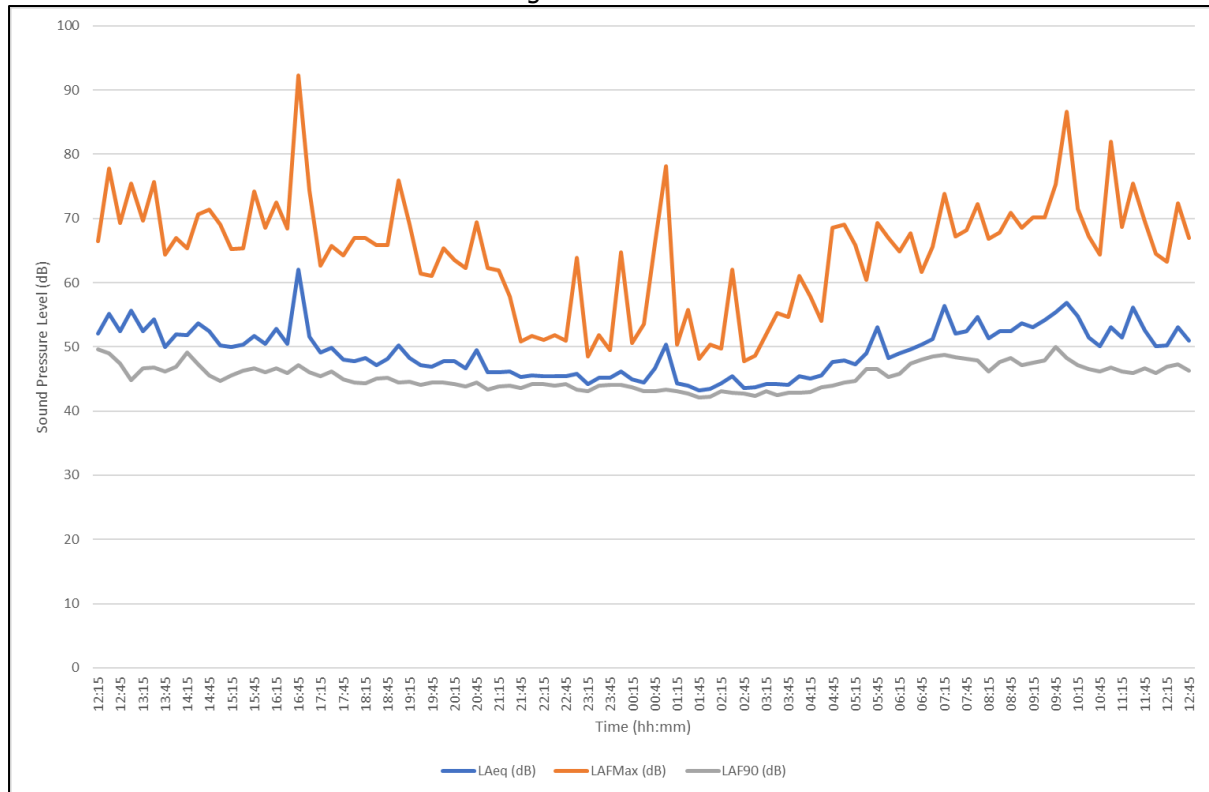


Table 2: Summary of the design background sound levels at monitoring location A

Parameter	Measured Noise Level
Daytime LA90 1hours dB	45
Night-time LA90 15minute dB	43

6. Operational Noise Modelling

Operational noise should be considered as part of the application. The final users are not known, however the impact of deliveries can be addressed in outline.

6.1. Delivery Noise

We understand that deliveries would be undertaken via a tail lift from 7.5T or articulated lorries. Deliveries will also arrive from 3.5T vans and unloaded by hand.

The main noise source from a delivery will be unloading via tail lift from 7.5T or articulated lorries. Based on the size of the site we would expect only one delivery could occur in any one hour period. It is also expected deliveries will occur during the day only and for approximately 30 minutes at a time. Our assessment is on this basis.

ACL have completed numerous surveys and assessments with such processes, and we have found that tail lift noise levels do not vary significantly from site to site. ACL have built up a vast library of delivery noise data that can be utilised in this instance. We will therefore utilise our library data to complete the assessment.

The measured noise levels noted are provided below; these are free-field levels at a distance of 10. The measured levels include reflections off the store building.

Table 3: Typical Delivery Operation Noise Emission

Duration, T (min)	L _{Aeq(T)} (dB)	Activity
5	61	HGV Arrive (at 10m)
2	63	HGV Depart (at 10m)
60	63	Unloading Goods via Tail Lift (at 10m)

6.2. Predicted Noise Level

Noise level predictions have been carried out using the general method of sound propagation.

6.2.1. Time Correction

The deliveries will occur during the day only, and as such the noise levels noted above should be corrected to a one hour equivalent noise:

Table 4: Typical Delivery Operation Noise Emission Corrected to a one hour level

Measured Duration, T (min)	L _{Aeq(T)} (dB)	Activity	L _{Aeq(1hr)} (dB)
5	61	HGV Arrive (at 10m)	50
2	63	HGV Depart (at 10m)	48
60	63	Unloading Goods via Tail Lift (at 10m)	63
Cumulative Level at 10m			63

6.2.2. Distance Correction

The most sensitive receivers to delivery noise will be those on Thomas St, 57 metres to the north which overlook the site. All other dwellings are either further from the site or shielded from delivery noise by the buildings of the development.

This gives a distance correction from 10m to 57m of -15dB.

6.2.3. Barrier Correction

The most sensitive receivers to delivery noise will be those on Thomas St, these will overlook the site, but will have a reduced view of the delivery area due to the topography and proposed buildings.

We would consider a correction of up to -10dB to be applicable, but to be conservative -5 dB has been applied.

6.2.4. Predicted Specific Sound Level

Taking into account the above, the predicted specific sound level is 43 dB $L_{Aeq(1hr)}$.

6.3. Initial Assessment

A British Standard 4142:2014 assessment of the impact of industrial noise from the deliveries has been undertaken at a location representative of the NSRs.

6.3.1. Background Sound Level

From the measured data we have determined typical background sound levels to be 45 dB $L_{A90,1hour}$ during the day.

6.3.2. Specific Sound Level

The predicted cumulative specific sound level of noise due to operations at the site is 43 dB $L_{Aeq,1hour}$ during the day.

6.3.3. Character Corrections

Character corrections should be added to the 'specific sound level' if it exhibits any *tonality, impulsivity, other specific characteristics and/or intermittency* at the assessment location. Based on our site visit and knowledge deliveries, corrections to be applied are as follows:

- ***Tonality*** – Deliveries to units such as this would not normally include any cooling units which could create tones, as such, no tonality correction is applied.

- **Impulsivity, Intermittency and Other Sound** – Impulsivity, intermittency and other sound from deliveries can be a factor, however the site and receivers are already exposed to impulsive sounds from Lliw building supplies, as such, we would consider the character of these deliveries to not be clearly distinguishable over the residual noise climate and no correction is applied.

6.4. Initial Estimate of Impact

Considering the data and information provided above, the British Standard 4142:2014 initial estimate at the sensitive receiver location is as follows.

Table 5: British Standard 4142:2014 Initial Estimate

Parameter	Daytime (07:00 – 23:00)
Background Sound Level, $L_{A90,T}$	45 dB
Specific Sound Level $L_{Aeq,T}$	43 dB
Acoustic Character Correction	+0 dB
Rating Level $L_{Ar,T}$	43 dB
Difference between rating and background level	-2 dB

This means that the rating sound level is likely to result in a low impact on the existing dwellings during day and night-time hours.

6.4.1. Context

6.4.2. Absolute Levels

BS4142 states:

- 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.*

With regard to 'absolute levels', the most relevant guidance is British Standard 8233:2014. Internally to a dwelling, the internal ambient noise levels should not exceed 35 dB $L_{Aeq(8hr)}$ during the day.

The internal level is approximately 15 dB quieter than the external free-field level (as stated by the BS8233:2014 and WHO 1999) allowing for the attenuation of a partially open window. Therefore, based on the predicted rating levels noted above, the internal absolute levels are as follows.

Table 6: Comparison with British Standard 8233:2014

Delivery Rating Level dB L_{Ar,1hr}	Open Window Correction dB(A)	Predicted Internal Level dB(A)	Within BS8233 Criteria?
43	-15	29	YES

As can be seen from the table above, the internal rating sound level fall within the British Standard 8233:2014 criteria during the day.

6.4.3. **Other context**

Further, the site is in an industrial area with a building supplies company and council depot to the south. These sources contribute to the noise climate. The delivery noise will be similar in nature and not a new noise source. As such, noise from deliveries falls into context with the surrounding area.

6.5. **Summary of Delivery Noise Assessment**

When assessed in accordance with the methodology of the BS4142 the initial estimate falls below the existing daytime background noise levels at the site and as such is a low impact. We would consider delivery noise is suitably controlled and meets the requirements of PPW to not cause adverse impact.

7. Operational Noise Limits

As this is a speculative operator application, no detailed information is known at this stage. Any plant or unit associated with the proposed development has the potential to have noise generating plant depending on the final operator.

The noise impact of this scheme can be controlled by setting appropriate noise limits on the consent.

As such, we have provided noise limits at the nearest noise sensitive dwellings based on the monitoring data obtained above and British Standard 4142:2014.

Based on the above criteria and operational hours the following table provides the maximum cumulative rating of noise from plant and internal industrial operations when assessed to BS4142.

Table 7: Operational Noise Limits

Time Period	Maximum Cumulative Rating Level at nearest dwellings
Daytime (07:00 to 23:00 hrs)	45 dB L _{Ar} (1 hour)
Night-time (23:00 to 07:00 hrs)	43 dB L _{Ar} (15min)

Any character (tonality, intermittency or other sound characteristics) should not be readily distinguishable at the dwellings. If character is present, a character correction should be applied as per BS4142.

The above noise limits are the cumulative noise limits where measured or predicted at the most sensitive receivers around the site.

If considered necessary, a planning condition could be imposed requiring submission and approval of the finalised details of each unit prior to operation. The condition should refer to the above noise limits.

8. Summary & Conclusions

Bluefield Land Limited appointed Acoustic Consultants Ltd to undertake a noise impact assessment in relation for the proposed light industrial units.

The report presides the results of a baseline survey, identifies relevant planning and noise guidance, sets noise limits for the use of the industrial units. The report also provides an assessment of the potential delivery noise from the use.

The noise impact assessment has been undertaken in accordance with the guidance in the Planning Policy Wales, TAN11 and British Standard 4142:2014+A1:2019 (BS4142).

Delivery noise, when assessed in accordance with the methodology of the BS4142 the initial estimate, falls below the existing daytime background noise levels at the site and as such is a low impact.

Noise limits have been proposed, with these noise limits being met, the residential amenity at the receivers in the areas will not be adversely affected. If considered necessary, a planning condition could be imposed requiring submission and approval of the finalised details of each unit prior to operation. The condition should refer to the noise limits of this report.

We would consider development noise can be suitably controlled and meets the requirements of PPW to not cause adverse impact.

9. Appendix 1 – Glossary of Acoustic Terminology

A-weighted sound pressure p_A – value of overall sound pressure, measured in pascals (Pa), after the electrical signal derived from a microphone has been passed through an A-weighting network.

A-weighted sound pressure level, L_{pA} – quantity of A-weighted sound pressure given by the following formula in decibels (dBA)

$$L_{pA} = 10 \log_{10} (p_A/p_0)^2$$

where:

p_A is the A-weighted sound pressure in pascals (Pa);
 p_0 is the reference sound pressure (20 μ Pa)

Background sound level, $L_{A90,T}$ – A-weighted sound pressure level that is exceeded by the residual sound assessment location for 90% of a given time interval, T, measured using weighting F and quoted to the nearest whole number of decibels

Break-in - noise transmission into a structure from outside.

Decibel (dB) – The decibel is the unit used to quantify sound pressure levels. The human ear has an approximately logarithmic response to acoustic pressure over a very large dynamic range (typically 20 micro-Pascals to 100 Pascals). Therefore, a logarithmic scale is used to describe sound pressure levels and also sound intensity and power levels. The logarithms are taken to base 10. Hence an increase of 10 dB in sound pressure level is equivalent to an increase by a factor of 10 in the sound pressure level (measured in Pascals). Subjectively, this increase would correspond to a doubling of the perceived loudness of sound.

Equivalent continuous A-weighted sound pressure level, $L_{Aeq,T}$ – value of the A-weighted sound pressure level in decibels of continuous steady sound that, within a specified time interval, $T = t_2 - t_1$, has the same mean-squared sound pressure as a sound that varies with time, and is given by the following equation:

$$L_{Aeq,T} = 10 \lg_{10} \left\{ (1/T) \int_{t_1}^{t_2} [p_A(t)^2/p_0^2] dt \right\} \quad (1)$$

where:

p_0 is the reference sound pressure (20 μ Pa); and

$p_A(t)$ is the instantaneous A-weighted sound pressure (Pa) at time t

NOTE The equivalent continuous A-weighted sound pressure level is quoted to the nearest whole number of decibels.

Facade level – sound pressure level 1 m in front of the façade. Facade level measurements of L_{pA} are typically 1 dB to 3 dB higher than corresponding free-field measurements because of the reflection from the facade.

Free-field level – sound pressure level away from reflecting surfaces. Measurements made 1.2 m to 1.5 m above the ground and at least 3.5 m away from other reflecting surfaces are usually regarded as free-field. To minimize the effect of reflections the measuring position has to be at least 3.5 m to the side of the reflecting surface (i.e. not 3.5 m from the reflecting surface in the direction of the source).

Octave and Third Octave Bands – The human ear is sensitive to sound over a range of frequencies between approximately 20 Hz to 20 kHz and is generally more sensitive to medium and high frequencies than to low frequencies within the range. There are many methods of describing the frequency content of a noise. The most common methods split the frequency range into defined bands, in which the mid-frequency is used as the band descriptor and in the case of octave bands is double that of the band lower. For example, two adjacent octave bands are 250 Hz and 500 Hz. Third octave bands provide a fine resolution by dividing each octave band into three bands. For example, third octave bands would be 160 Hz, 250 Hz, 315 Hz for the same 250 Hz octave band.

Sound pressure level – Sound pressure level is stated on many of the charts. It is the amplitude of the acoustic pressure fluctuations in a sound wave, fundamentally measured in Pascals (Pa), typically from 20 micro-Pascals to 100 Pascals, but commonly simplified onto the decibel scale.

Sound reduction index, R – laboratory measure of the sound insulating properties of a material or building element in a stated frequency band.

Specific sound level, $L_s = L_{Aeq,T_r}$ – equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, T_r .

Structure-borne noise – audible noise caused by the vibration of elements of a structure, the source of which is within a building or structure with common elements.

Rating level, L_{A_r,T_r} – Specific sound level plus any adjustment for the characteristic features of the sound.

Reverberation Time, T – The reverberation time is defined as the time taken for a noise level in an enclosed space to decay by 60 dB from a steady level once the noise source has stopped. It is measured in seconds. Often a 60 dB decay cannot be measured so the reverberation time is measured over a lesser range and corrected back to the time for a 60 dB drop assuming a constant decay rate. Common parameters are T20 (time taken for a 20 dB decay multiplied by three) and T30 (time taken for a 30 dB decay multiplied by two).

Vibration Dose Value, VDV – measure of the total vibration experienced over a specified period of time.

Estimated Vibration Dose Value, $eVDV$ – estimation of the total vibration experienced over a specified period of time. This is usually based on the number of events and shortened measurement data.

Weighted sound reduction index, R_w – Single-number quantity which characterizes the airborne sound insulating properties of a material or building element over a range of frequencies. The weighted sound reduction index is used to characterize the insulation of a material or product that has been measured in a laboratory (see BS EN ISO 717-1).



ACOUSTIC
CONSULTANTS LTD

Head Office: 194 West Street, Bedminster, Bristol, BS3 3NB
T: 0117 986 2956

www.acoustic-ltd.co.uk

Registered Office: 194 West St, Bristol, BS3 3NB Registered No: 8544901