



ACOUSTIC
CONSULTANTS LTD

Noise Impact Assessment

**Lower Pontneddfechan, Neath
Proposed Mixed-Use Development**

Reference: 10750/CP

Client:**Document Control**

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1.0	First Issue	22/05/2025	Chandi Petro	James Abbass	James Abbass
2.0	Inclusion of ASHP assessment	03/12/2025	James Abbass	--	--

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.

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1. Introduction

Hiraeth Architecture appointed Acoustic Consultants Limited to undertake a noise impact assessment for the proposed mixed-use development located at Pontneddfechan, Glynneath, Neath, SA11 5NR.

Site noise surveys have been undertaken to determine the existing noise levels at the site to aid in undertaking the following assessment.

Relevant assessment criteria have been identified including British Standard 8233:2014 (BS8233), and Approved Document O (Wales) (ADO) which are used to achieve planning aims in Planning Policy Wales (PPW) and Technical Advice Note 11 (TAN11).

The report has been reviewed by a full Member of the Institute of Acoustics (MIOA) who has seven years of experience in the field.

Revision 2 of this report includes a full assessment of the proposed air source heat pump (ASHP) in terms of noise impact in accordance with BS4142:2014, and Condition 5 of the granted planning application Decision Notice.

2. The Site & Proposals

The proposed development is located at Pontneddfechan, Glynneath, Neath SA11 5NR. The surrounding area is mixed-use, comprising agriculture to the north, west, and south with dwellings to the east.

Proposals include for an accommodation block comprising eight bedrooms, a shop and café, and a toilet block. Fixed plant is proposed to be housed within its own area to the west boundary of the site.

Figures displaying the proposed site location and NSRs are provided below.

Figure 1: A Google satellite image annotated to show site and NSR locations



3. Planning Condition

In relation to fixed external plant at the site, the granted planning approval states the following, in Condition 5 of the Decision Notice:

"Prior to the commencement of work on site, including demolition, the developer shall submit a detailed Noise Impact Assessment, prepared by a qualified acoustic consultant, to the Local Planning Authority for approval. The assessment shall evaluate the potential noise impacts of the development on surrounding properties and sensitive receptors, particularly during both construction and operational phases. The assessment must be conducted in accordance with current standards and guidelines relevant in Wales, including BS 4142:2014+A1:2019 (Methods for Rating and Assessing Industrial and Commercial Sound) or any succeeding guidance.

Where significant noise impacts are identified, the assessment shall also include detailed mitigation measures to reduce noise to acceptable levels. All recommended mitigation measures shall be implemented in full prior to the first occupation of the development and maintained thereafter for the duration of the development.

Reason:

To protect the amenity of the locality, especially for people living and/or working nearby, in accordance with Local Planning Policy."

4. Assessment Methodology

The following sections set out criteria that will be considered within the assessment.

4.1. Indoor Ambient Noise Levels

The TAN11 noise exposure categories (NECs) are noted above. If a site falls into a NEC A, no noise control measures are required. If a site falls into other thresholds the development could be considered suitable for residential use, subject to noise control measures, meeting the following indoor noise level criteria:

4.1.1. British Standard 8233:2014 – Indoor Noise Levels

This standard, entitled 'Guidance on sound insulation and noise reduction for buildings', provides advice on noise as it affects buildings of all types, giving consideration to various common sources of noise. This is considered relevant when assessing noise from existing anonymous noise sources (road traffic) as it effects the proposed residential properties.

It outlines design guidance in general terms and provides criteria for the indoor ambient noise levels (IANLs) for different types of room. These are stated in terms of the 'equivalent continuous sound pressure level' over the reference time period, the $L_{Aeq, T}$. The IANLs specified by British Standard 8233 that are relevant to this development are as follows.

Table 1: IANL criteria of British Standard 8233:2014

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living room	35 dB $L_{Aeq,16hour}$	--
Dining	Dining room / area	40 dB $L_{Aeq,16hour}$	--
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,8hour}$

Section 7.7.2 Note 4 of the British Standard states "*Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or $L_{Amax,F}$ depending on the character and number of events per night. Sporadic noise events could require separate values*".

British Standard 8233:2014 provides no definitive criteria for maximum noise levels from individual events ($L_{Amax,F}$). Section 3.4 of the WHO Guidance states "*For a good sleep, it is believed that indoor sound pressure levels should not exceed approximately 45 L_{Amax} more than 10-15 times per night (Vallet & Verbey 1991)*".

4.1.2. **Approved Document O - Overheating Conditions**

Approved Document O (ADO) is a building regulations requirement in Wales from November 2022. ADO (Wales) states:

2.2 High levels of external noise could limit the use of cross-ventilation to mitigate the risk of summer overheating. External noise is a material consideration considered when applying for Planning permission and mitigating measures may be required in the design in order to obtain Planning permission and controlled through a condition imposed on the consent. In exceptional cases, this could include non-openable windows. More commonly, windows will be openable in order to enable natural ventilation to occur at less sensitive times of day, when there is lower noise, when people are not present in the room, or when they are present but not engaged in noise-sensitive activities. But those windows may need to be kept closed at times to maintain acceptable indoor acoustic conditions, for example when people are using the rooms for sleep or office work. A noise issue may be identified at the Planning stage but rely on occupants to close windows at noise sensitive times rather than prevent them from ever opening them, and in those cases overheating strategies should assume windows will be closed during noise-sensitive periods even if they are not fixed closed.

2.3 When the removing excess heat as part of the overheating strategy, noise levels in bedrooms should be kept to a minimum during the sleeping hours of 23:00-07:00. Building control bodies may accept as evidence that this requirement is satisfied:

- a. documentation to demonstrate that the local planning authority did not consider external noise to be an issue at the site at the planning stage or;*
- b. if the local planning authority did consider external noise to be an issue that should be controlled through a condition at planning stage, then documentation to demonstrate that the proposals for heat removal (during the sleeping hours of 23.00 – 07.00) are accommodated within or do not conflict with documentation provided to the local planning authority to satisfy any related planning permission condition(s). (For example any expectation that windows on one or more façade, or in certain rooms, will need to be kept closed during noise-sensitive periods.)”*

ADO (Wales) does not apply any clearly defined noise limits. ADO (Wales) relies on the noise criteria within planning conditions or documentation submitted at planning stage. As such it is our opinion that the most relevant guidance for overheating noise limits (at night) is ADO (England) which states:

3.3 Windows are likely to be closed during sleeping hours if noise within bedrooms exceeds the following limits.

- a. **40dB $L_{Aeq,T}$** , averaged over 8 hours (between 11pm and 7am).*
- b. **55dB L_{AFmax}** , more than 10 times a night (between 11pm and 7am).*

4.2. Fixed Plant Noise - British Standard 4142:2014

As noted in Condition 5 of the Decision Notice, fixed plant noise will be assessed to BS4142.

For fixed plant noise, the most relevant guidance is provided within British Standard 4142:2014+A1:2019. The methods described in the British Standard use outdoor sound levels to assess the likely effects of sound upon people who might be inside or outside a dwelling or other premise used for residential purposes.

The initial estimate 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.

5. Noise Monitoring

A baseline noise monitoring exercises was undertaken from 22nd of April to the 24th of April 2025 to determine noise levels effecting the proposed sensitive areas, along with obtaining existing background noise climate data to assess the impact of noise generating proposals on the existing and proposed residential dwellings.

5.1. Monitoring Equipment

Sound Pressure Levels were measured using a Class 1 sound level meter with a half-inch condenser microphone, using the 'fast' setting. The equipment is checked regularly using a Quality System meeting the requirements of British Standard EN ISO/IEC 17025:2017 "General requirements for the competence of testing and calibration laboratories"; in accordance with British Standard EN 10012:2003 "Measurement management systems. Requirements for measurement processes and measuring equipment"; and traceable to the National Standards.

This equipment was checked and calibrated as noted below and the certificates are available for inspection.

Table 2: Monitoring Equipment

Equipment Description / Manufacturer / Type	Serial Number	Date of Calibration	Calibration Certification Number
SLM, Sonitus, EM2030	00756	24/07/2023	44911
Pre-Amp, Sonitus	59642	24/07/2023	44911
Microphone, Sonitus, 378B02	309501	24/07/2023	44910

5.2. Weather Conditions

Weather during the survey was generally calm and dry with wind speeds below 5m/s.

The approximate weather conditions are noted below.

Table 3: Weather Conditions During Survey

Survey Period	Wind Speed (m/s)	Prevailing Wind Direction	Temperature (°C)	Precipitation time (hrs)	Cloud Cover (%)
22/04/2025	<4m/s	NE	13	0	25
24/04/2025	<5m/s	N	16	0	25

These weather conditions are not expected to have impacted the collected data.

5.3. Measurement Procedure

A partially attended baseline noise monitoring exercise was undertaken north of the proposed site (see Figure 4). The microphone was mounted in a free field position on a tripod at a height of 1.5 meters.

The main noise source was road traffic from A465 to the south, river sounds from the east, and sheep noises from the field to the south.

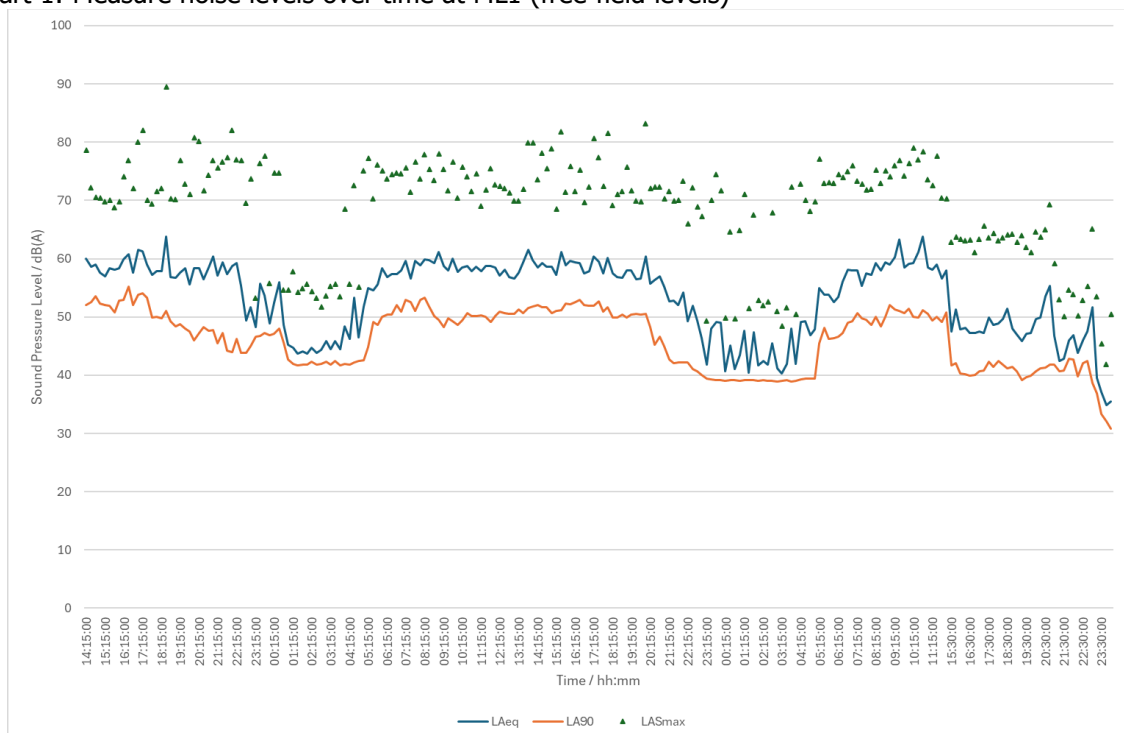
Figure 4: Monitoring Locations



5.4. Measured Noise Levels

The variation in A-weighted equivalent, maximum and background noise levels over time are provided in the chart below.

Chart 1: Measure noise levels over time at ML1 (free-field levels)



From the measured data we have determined the following free-field octave band 'daytime' and 'night-time' road traffic noise levels. The levels in the table below have been corrected for a free-field environment.

Table 4: Measured noise levels at ML1 (free-field levels)

Parameter	Sound Pressure Level (dB) per Octave Band (Hz)								dB(A)
	63	125	250	500	1000	2000	4000	8000	
Day $L_{eq,(16hr)}$	61	58	54	53	55	52	45	38	59
Night $L_{eq,(8hr)}$	53	48	44	44	48	45	39	32	51
Night $L_{max(F)}^*$	78	75	71	70	72	69	62	55	76

*The night-time max has been determined from the fourth highest max level to account for the 15-minute sample period.

The data has been further summarised as noted in the table below.

Table 5: Summarised Noise Levels at ML1

Period	LA90,15min / dB		LAeq,15min/ dB	
	Range	Mode	Range	Mode
Daytime (07:00 – 23:00)	39 - 55	50	43 – 68	59
Night-time (23:00 – 07:00)	31 - 52	39	35 - 58	42

6. Noise Modelling

To determine noise levels across the site, noise modelling has been undertaken using computer modelling package Cadna:A by DataKustik and the road traffic noise levels noted above.

The software predicts road traffic noise propagation using the method of 'The Calculation of Road Traffic Noise 1988', and a verification model has been created to ensure the measured and predicted levels are comparable. This model is available upon request.

6.1. Road Traffic

6.1.1. Modelling Parameters

The noise predictions have been undertaken using the supplied plans noted above and the following general modelling parameters:

- To determine the noise levels across the site and surrounding areas, this has been taken as a hard-reflective ground which is a worst-case scenario.
- Reflections from opposite façades have been determined via the correction method (+1.5 dB).
- All dwellings onsite have a height of 6 metres from the ground level
- The noise maps predict noise levels across the site from the noted noise sources at a height of 1.5 metres above the ground for the daytime habitable rooms and external amenity areas. For the night-time noise map the noise levels are predicted at a height of 4.5 metres above ground.
- The external amenity areas' daytime noise levels were predicted at a ground floor level height of 1.5 metres and are shown on noise maps below. A 2x2 grid noise map was considered.
- The site was determined to be flat from Google Maps imagery

6.1.2. Road Traffic Modelling Results

Predicted noise emission maps for equivalent noise levels during the daytime ($L_{Aeq,16hour}$), night-time ($L_{Aeq,8hour}$), and maximum noise events (L_{AFmax}) during the night-time are provided in the figures below.

Figure 5: Daytime $L_{Aeq}(16hr)$ noise prediction map with a grid and building evaluation height of 1.5m

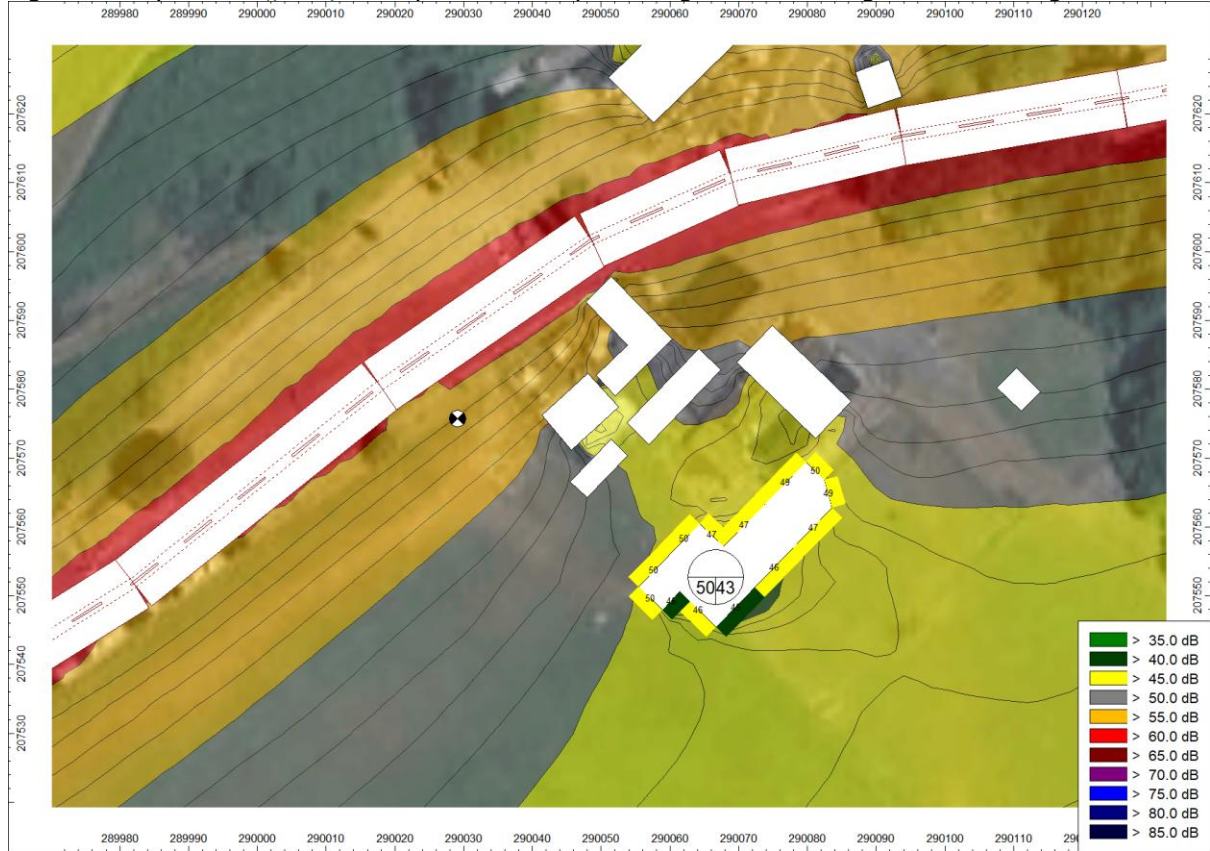


Figure 6: Night-time ($L_{Aeq}(8hr)$) noise prediction map with a grid and building evaluation height of 4.5m

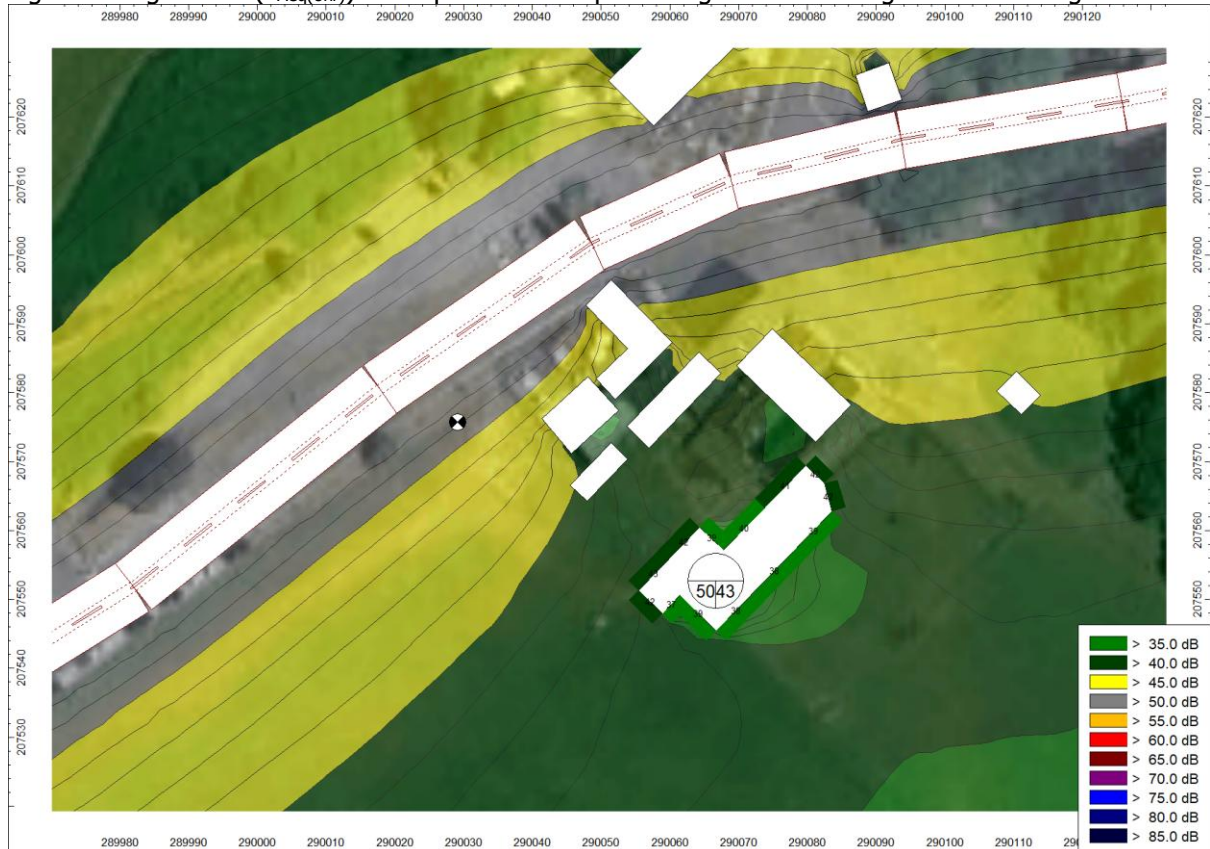
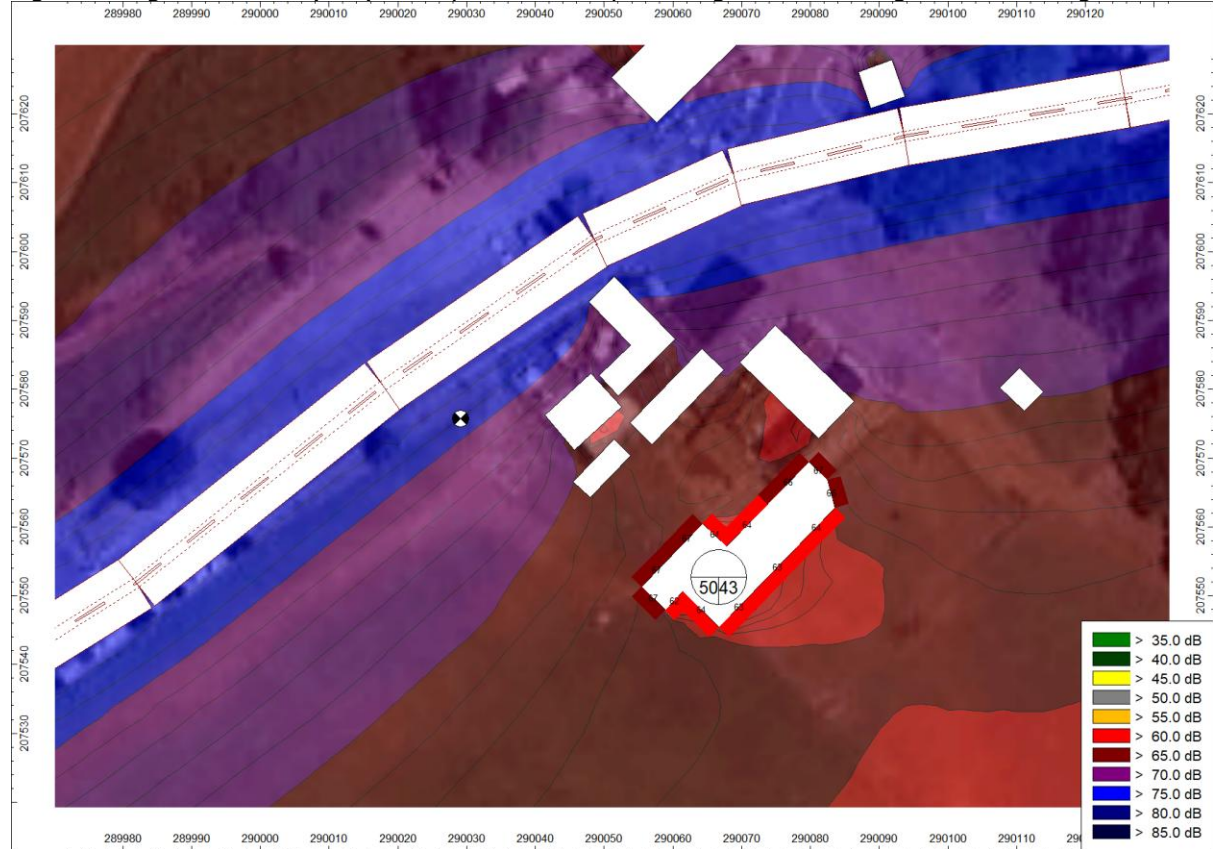


Figure 7: Night-time Max (L_{max}) noise prediction map with a grid and building evaluation height of 4.5m



From the modelling undertaken the noise exposure levels are as follows:

Daytime, $L_{Aeq,16hour} = 50$ dB $L_{Aeq,16hour}$

Night-time, $L_{Aeq,8hour} = 43$ dB $L_{Aeq,8hour}$

6.2. Plant Noise

6.2.1. Modelling Parameters

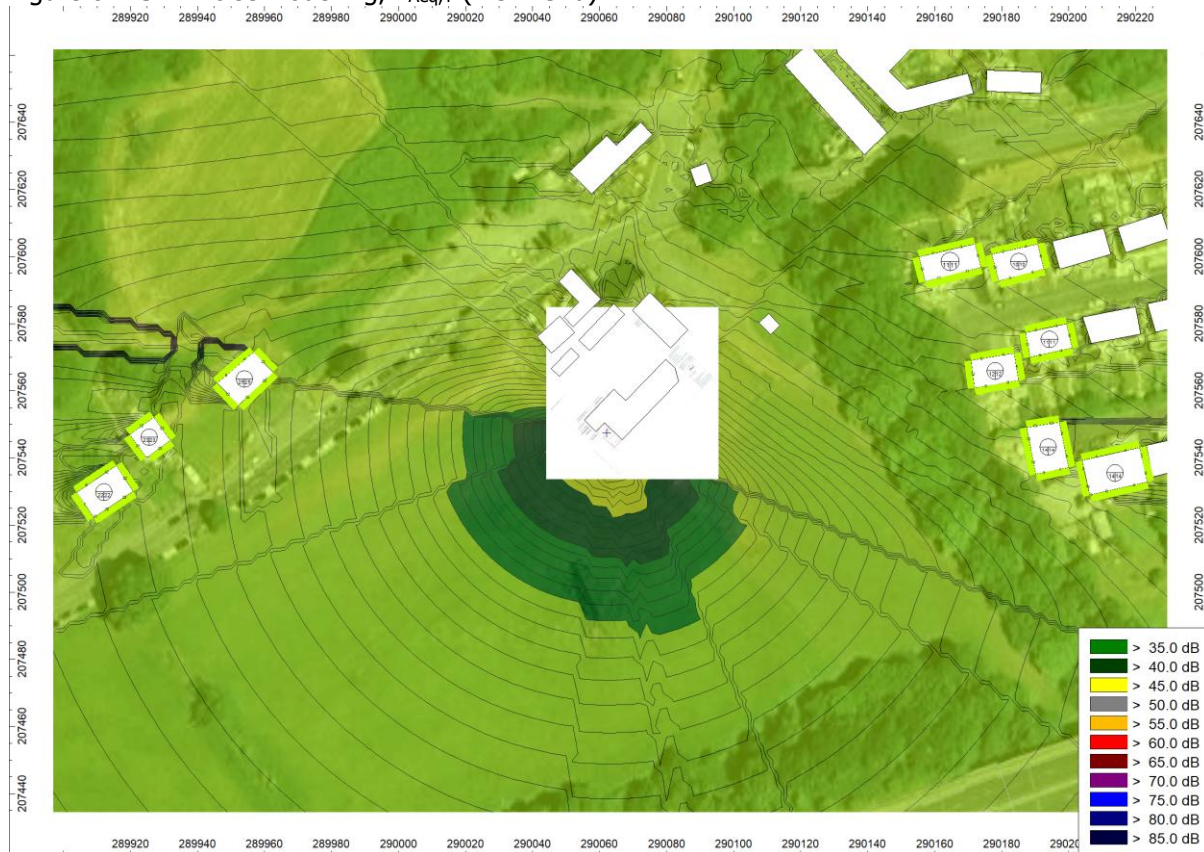
The noise predictions have been undertaken using the supplied plans noted above and the following general modelling parameters:

- To determine the noise levels across the site and surrounding areas, this has been taken as a hard-reflective ground which is a worst-case scenario
- Reflections are based on an order of 3
- All dwellings onsite have a height of 6 metres from the ground level
- Nearby receivers are included at heights determined from Google Earth imagery
- Building evaluations are undertaken as the worst-case at each façade
- The site was determined to be flat from Google Maps imagery
- The ASHP is included as a point source at a height of 1.8m above ground
- The ASHP location is provided above

6.2.2. Plant Noise Modelling Results

The following figure provides a noise map of the ASHP operating as indicated above.

Figure 8: ASHP Noise Modelling, $L_{Aeq,T}$ (4.5m Grid)



The worst-case ASHP modelling results are summarised below:

- East NSRs = 14 dB $L_{Aeq,T}$
- West NSRs = 25 dB $L_{Aeq,T}$

7. Noise Exposure Category

Based on the noise modelling of the proposed residential use façades provided above, the application site falls into NEC A, which states:

"Noise need not be considered as a determining factor in granting planning permission, although the noise level at the high end of the category should not be regarded as desirable."

Therefore, no specific acoustic or noise control measures are required for the residential aspect of the development. Standard construction methods can be used in the design of this building.

8. Plant Noise Assessment

An assessment of external ASHP plant noise is provided in accordance with British Standard 4142:2014+A1:2019.

8.1. Initial Estimate of Impact

8.1.1. Background Sound Level

From the measured data we have determined a typical background level of 50 dB $L_{A90(1hr)}$ during the day and 39 dB $L_{A90(15mins)}$ this is representative of the levels at the worst-case NSRs.

8.1.2. Predicted Specific Sound Level

The specific free-field level sound level (L_s) at the NSRs, are

- East NSRs = 14 dB $L_{Aeq,T}$
- West NSRs = 25 dB $L_{Aeq,T}$

This is the level determined at the noise sensitive receiver without any character corrections applied.

8.1.3. 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. The corrections are as follows:

- **Tonality** – The predicted L_s falls at least 10dB below the measured background sound levels across the site. Therefore, any tonality present in the plant unit is not expected to be audible. No correction applied.
- **Impulsivity** – Plant such as this is not normally impulsive. No correction applied.
- **Intermittency** – The predicted L_s falls at least 10dB below the measured background sound levels across the site. Therefore, any intermittency present from the plant unit operating is not expected to be audible. No correction applied.
- **Other Sound Characteristics** – The predicted L_s falls at least 10dB below the measured background sound levels across the site. Plant noise due to ASHP use is not expected to be audible at the NSRs. No correction applied.

8.1.4. Initial Estimate

Therefore, the British Standard 4142:2014 initial estimate at the most sensitive location is as follows:

Table 6: British Standard 4142:2014 initial estimate for NSR

Parameter	East NSRs		West NSRs	
	Daytime (07:00-23:00)	Night-time (23:00-07:00)	Daytime (07:00-23:00)	Night-time (23:00-07:00)
Background Level, $L_{A90, (T)}$	50 dB	39 dB	50 dB	39 dB
Specific Sound Level, $L_{Aeq, (T)}$	14 dB	14 dB	25 dB	25 dB
Character Correction	+0 dB	+0 dB	+0 dB	+0 dB
Rating Level, $L_{Ar(T)}$	14 dB	14 dB	25 dB	25 dB
Excess of rating over background level	-36 dB	-25 dB	-25 dB	-14 dB

This means that the plant rating noise level at will be of no impact when assessed to British Standard 4142:2014 during the day or night periods.

8.2. Context

It is not expected that the context would have altered the initial outcome of the BS 4142 assessment findings above.

8.3. Summary of assessment

The assessment demonstrates that plant noise will not be audible in comparison to the existing background sound levels across the NSRs.

Therefore, the planning condition requirements are achieved.

9. Summary & Conclusions

Hiraeth Architecture appointed Acoustic Consultants Limited to undertake a noise impact assessment for the proposed mixed-use development at Pontneddfechan, Glynneath, Neath SA11 5NR.

Relevant assessment criteria have been identified including British Standard 8233:2014 (BS8233), British Standard 4142:2014, and Approved Document O (Wales) (ADO) which are used to achieve planning aims in Planning Policy Wales (PPW) and Technical Advice Note 11 (TAN11).

A site noise survey has been carried out to determine the existing noise climate effecting the proposed development and the existing dwellings in the vicinity.

The residential aspect of the site falls into NEC A, and specific acoustic measures are not required. Standard construction methods can be used.

An assessment of ASHP noise has been carried out through modelling and in accordance with BS 4142. The assessment demonstrates that plant noise is expected to comfortably achieve the planning condition requirements.

10. 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:

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

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).



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