ACOUSTIC CONSULTANTS LTD

Noise Impact Assessment

Cefn Isaf Flats, Merthyr Tydfil
Proposed Residential Development

Reference: 10352/SF

Client:
MERTHYR VALLEYS HOMES

Document Control

Version:	Revision Description:	Date:	Author:	Reviewed by:	Approved by:
1.0	First Issue	02/08/2023	Sam Frankcom	James Abbass	Blake Lucas
RevA	PPW Edition 12	09/02/2024	Sam Frankcom	James Abbass	Blake Lucas

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 & Proposals	5
3.	Planning & Noise	7
4.	Assessment Criteria	11
5.	Baseline Noise Survey	13
6.	Noise Exposure Category	17
7.	Summary and Conclusions	18
8.	Appendix 1 – Glossary of Acoustic Terminology	19

1. Introduction

Merthyr Valley Homes appointed Acoustic Consultants Limited to undertake a noise and vibration assessment for the proposed residential development in Merthyr Tydfil.

A site noise survey was undertaken to determine the existing noise levels at the site, representative of the proposals.

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 Techncial Advice Note 11 (TAN11).

The author of this report is a Technician Member of the Institute Of Acoustics with over two years of experience in the field of noise and is suitably qualified to undertake this assessment. The report has been reviewed by a full Member of the Institute Of Acoustics with over 4 years' experience in acoustics. The report has been approved by a full Member of the Institute Of Acoustics with over 16 years' experience in acoustics.

2. The Site & Proposals

The proposed site is an existing residential building in Cefn-Coed-y-Cymmer, Merthyr Tydfil, that is no longer in use. It is proposed to demolish the existing structure and develop new residential apartment blocks on the site.

To the west of the site is a roundabout-junction where the A465 and A470 meet. The A465 is approximately 430m to the west and the A470 is approximately 250m to the southwest. Roads that boarder the site boundary itself include Pontycapel Road to the north and Wern Road to the west and south.

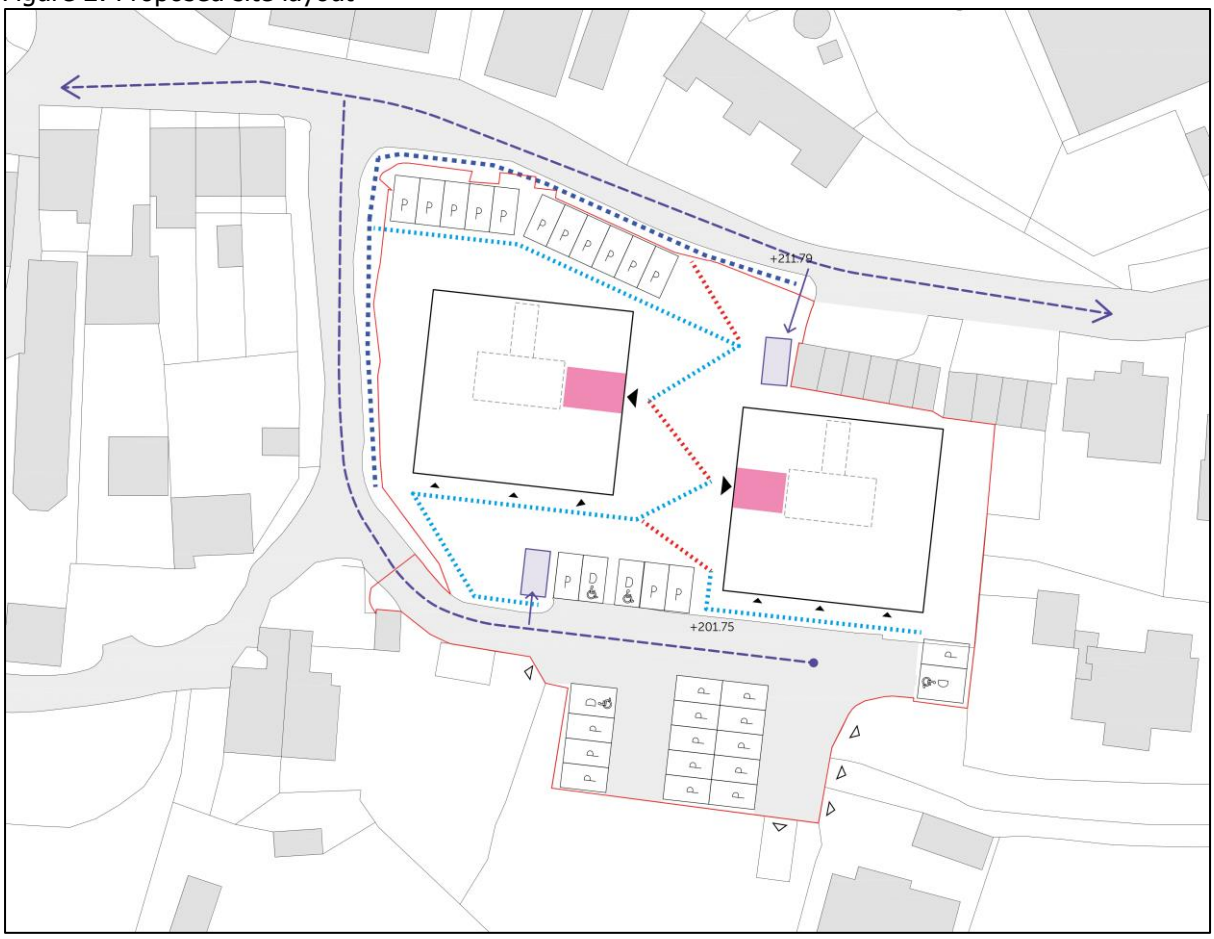
The surrounding area is primarily residential accommodation and has Ysgol Y Graig Community Primary School to the north of the site. There is also Goedre'r Coed Field approximately 100 meters to the east which is for general community use, sport matches and small-scale events such a school sports day.

The proposed development will include two residential blocks that will be 5 stories high and contain 44 new residential dwellings.

The figures below detail the site location in context and the proposed site layout.

Figure 1: Site location (red) in context

Figure 2: Proposed site layout



3. Planning & Noise

3.1. Planning Policy Wales (PPW)

Planning Policy Wales (PPW) Edition 12 dated February 2024 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.

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.

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

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".

Table 1 provides Noise Exposure Categories (NECs), which relate to proposed residential developments near to a transportation and mixed noise sources. NECs are addressed in ranges according to the free-field equivalent noise levels ($L_{Aeq,\ T}$) measured at the position of the proposed dwellings.

Table 1: TAN 11 noise exposure categories

NOISE SOURCE	**NOISE EXPOSURE CATEGORY**			
Mixed Noise	**A**	**B**	**C**	**D**
07.00 - 23.00 hours	<55	55 – 63	63 – 72	>72
23.00 - 07.00 hours	<45	45 – 57	57 – 66	>66

The Technical Advice Note (Wales) 11 gives advice to Local Planning Authorities on assessing proposals for residential developments near a source of noise, depending upon which of the four Noise Exposure Categories the proposed site falls into:

NEC A. *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.*

NEC B. *Noise should be taken into account when determining planning applications and where appropriate, conditions imposed to ensure an adequate level of protection.*

NEC C. *Planning permission should not normally be granted. Where it is considered that permission should be given, for example because there are no alternative quieter sites available, conditions should be imposed to ensure a commensurate level of protection against noise.*

NEC D. *Planning permission should normally be refused.*

In addition, it states: *"Night-time noise levels (23.000 - 07.00): sites where individual noise events regularly exceed 82 dB L_{Amax} (S time weighting) several times in any hour should be treated as being in NEC C, regardless of the $L_{Aeq,8h}$ (except where the $L_{Aeq,8h}$ already puts the site in NEC D)."*

Where the Noise Exposure Category for a site falls into NEC B, C or D mitigation will be necessary to control external noise observed within a dwelling.

4. Assessment Criteria

Where a site falls into NEC B – D, the following criteria should apply. If a site falls into NEC A, no specific noise control measures would be required.

4.1.1. British Standard 8233:2014

BS8233:2014 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 external noise sources as it effects the proposed residential properties under background ventilation conditions.

The standard 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 2: British Standard 8233:2014 Internal Noise Criteria

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

The British Standard does not provide any internal noise criteria for maximum noise levels.

Section 3.4 of the WHO Guidelines state *"For a good sleep, it is believed that indoor sound pressure levels should not exceed approximately 45 dB L_{Amax} more than 10-15 times per night (Vallet & Verbey 1991)".* We would consider this criteria applicable.

4.1.2. Overheating Ventilation – Approved Document O

Welsh Approved Document O does not set out noise thresholds above which overheating should be considered and states the following:

> *"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.)"

As no thresholds are set in the Welsh guidance, we would consider it reasonable to apply the limits set in the English Approved Document O if a site falls into NEC B-D only. The proposed criteria is as follows:

"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).

5. Baseline Noise Survey

A baseline noise survey was undertaken at the site between the 22nd and 26th of June 2023.

5.1. Monitoring Equipment

Sound Pressure Levels were measured using three Class 1 sound level meters with half-inch condenser microphones, 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 shown in Table 3 and the certificates are available for inspection.

Table 3: Equipment and Calibration Status

Equipment Description / Manufacturer / Type	Serial Number	Date of Calibration	Calibration Certification Number
SLM, NTI, XL2	A2A-09705-E0	23/09/2021	39023
Pre-Amp, NTI, MA220	5332	23/09/2021	39023
Microphone, NTI, MC230A	A14374	23/09/2021	39022
Calibrator, NOR-1251	35230	30/11/2022	42658
SLM, Svantek, 977A	69510	09/03/2022	1501934-1
Pre-Amplifier, Svantek, SV12L	73650	09/03/2022	1501934-1
Microphone, ACO Pacific, 7052E	70151	09/03/2022	1501934-1
Calibrator, Larson Davis, CAL200	17892	17/04/2023	44016

5.2. Weather Conditions

The table below details the weather conditions present at the site during the survey period. The approximate details provided are taken from timeanddate.com. The weather was calm, dry, and clear with wind speeds less than 5m/s.

Table 4: Noise Survey Weather Conditions

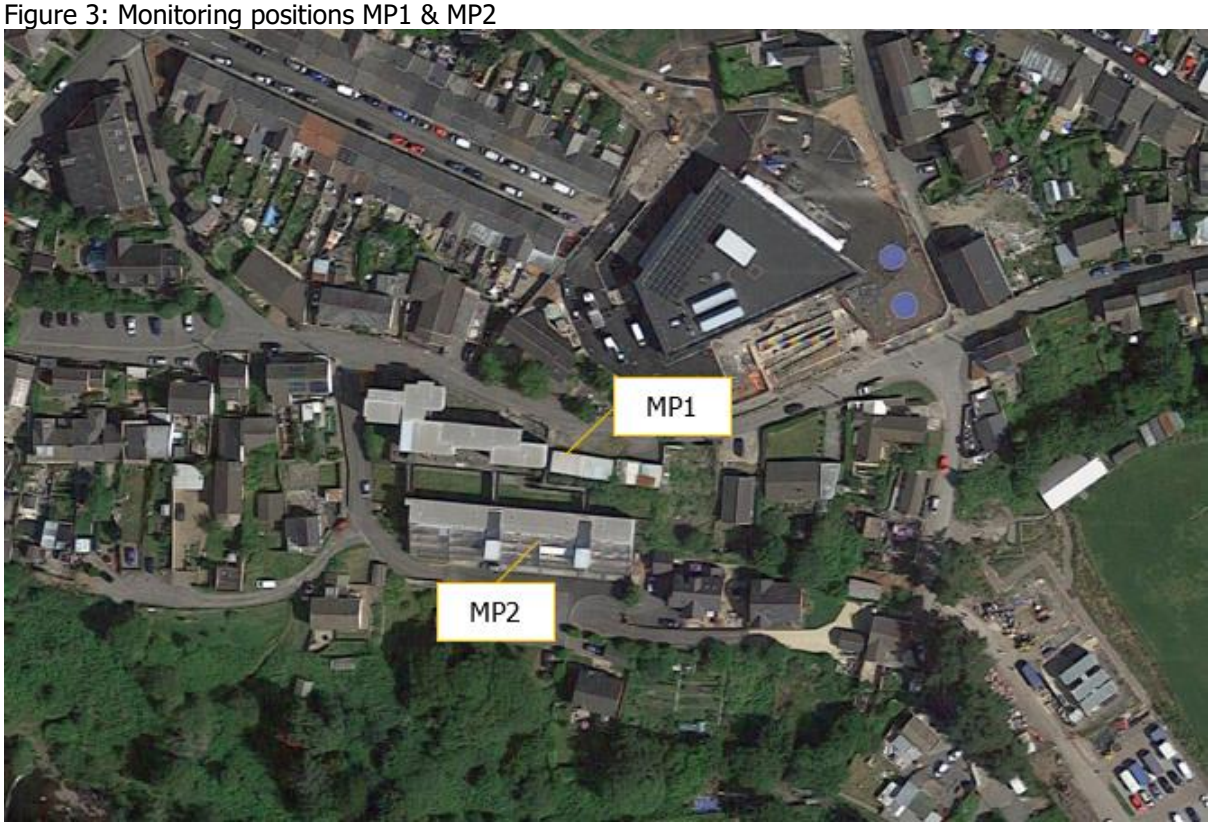
Date	Wind Speed (m/s)	Wind Direction	Average Air Temperature (°C)	Precipitation (time/hrs)	Cloud Cover (%)
22/06/2023	≤5	W	15 - 22	0	25
23/06/2023	≤3	W	14 – 23	0	25
24/06/2023	≤4	S	18 - 25	0	50
25/06/2023	≤5	SE / W	16 - 24	0	25
26/06/2023	≤5	W	14 - 20	0	25

Weather conditions are not considered to have had an adverse effect on the collected data.

5.3. Monitoring Procedure

The existing baseline noise climate was monitored in two locations at the site. The monitoring positions are provided in the figure below.

Figure 3: Monitoring positions MP1 & MP2



5.3.1. Monitoring Position 1

Monitoring position 1 was situated in a façade position out of a second story window on the northern façade of the existing building. The principal noise sources include distant road traffic from the A465 and some playground activity from the school to the north.

It should be of note that during the survey period, road works were being undertaken at the A465/ A470 junction to the west. The monitoring position was shielded from construction noise, so collected data is not expected to have been adversely affected. There was also light building work being undertaken at a dwelling approximately 45 meters to the east; this also is not expected to have had an adverse effect on the collected data.

5.3.2. Monitoring Position 2

Monitoring position 2 was situated in a façade position out of a fourth story window on the southern façade of the existing building. The principal noise sources include distant road traffic to the west on the A465 and to the south on the A470.

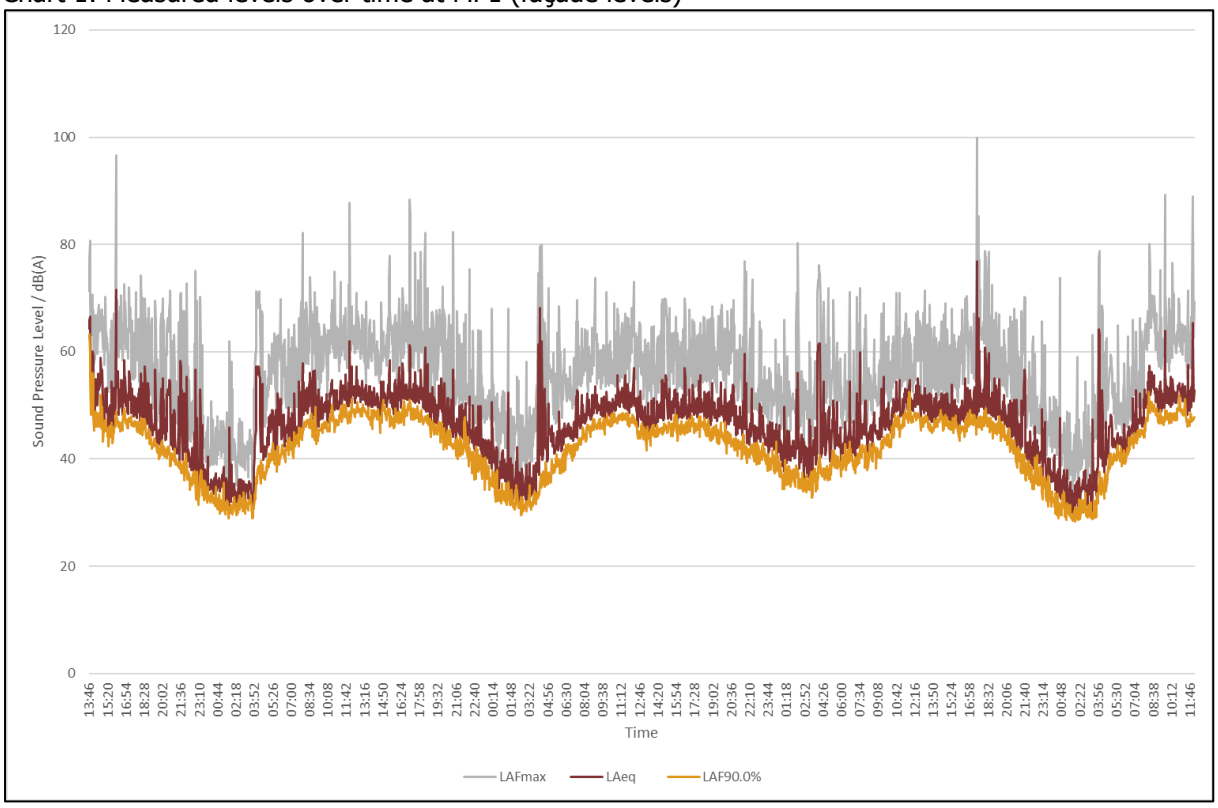
During the equipment set up, it was observed that there was a school fete/ sports day event at the nearby park to the east of the site. As with MP1, road works were being undertaken at the A465/ A470 junction to the west during the survey period; MP2 was shielded from this construction noise. Noise from the school event to the east and roadworks to the west is not expected to have had an adverse effect on the collected data.

5.4. Noise Monitoring Data

5.4.1. Monitoring Position 1

A chart detailing the measured equivalent ($L_{Aeq,\ 2\ minutes}$), maximum ($L_{AFmax,\ 2\ minutes}$) and background ($L_{A90,\ 2\ minutes}$) noise levels over the survey period is provided below.

Chart 1: Measured levels over time at MP1 (façade levels)



The table below details the measured daytime equivalent ($L_{Aeq,\ 16\ hour}$), night time equivalent ($L_{Aeq,\ 8\ hour}$) and night time maximum (L_{AFmax}) noise levels over the full survey period converted into free-field noise levels. The noise levels below are considered representative of the levels at the proposed northern façades.

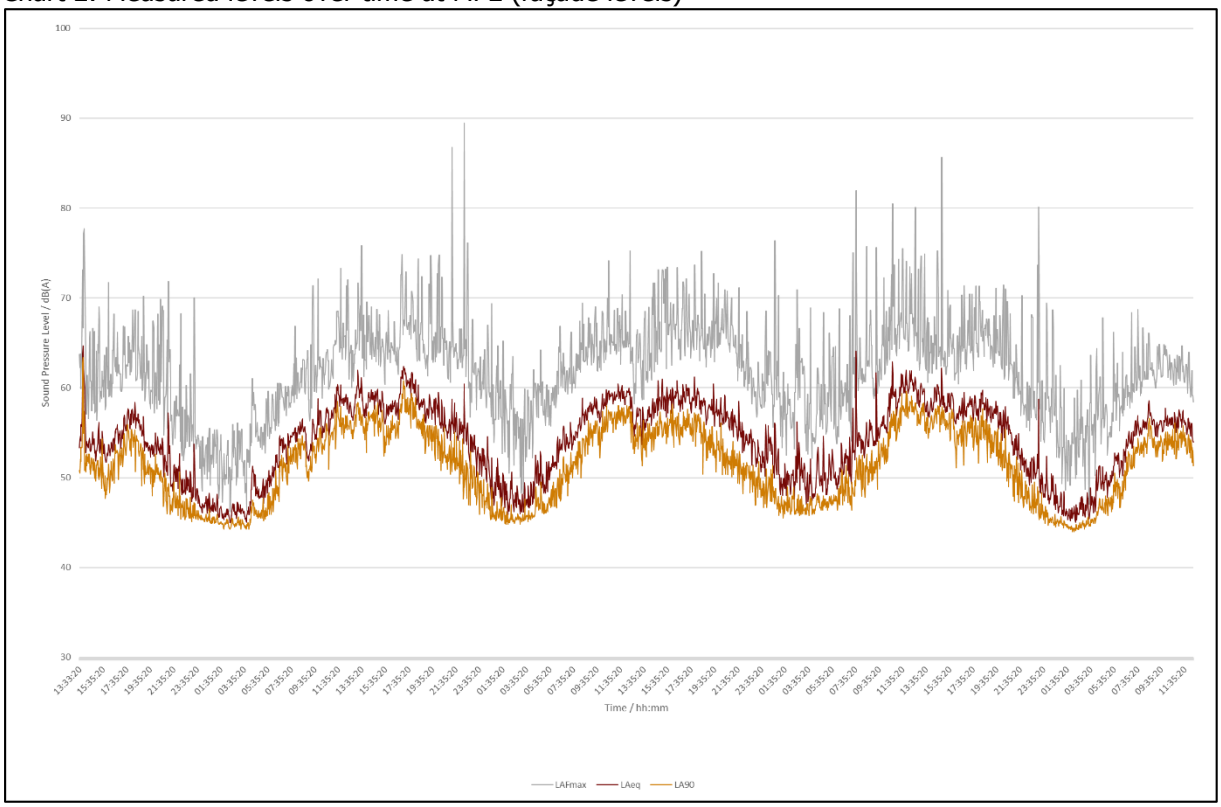
Table 5: Measured daytime and night time noise levels at MP1 (free field levels)

Parameter	Sound Pressure Level (dB) per Octave Band (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
$L_{Aeq,\ 16\ hour}$	52	47	47	45	45	42	36	30	49
$L_{Aeq,\ 8\ hour}$	43	37	36	34	36	41	35	25	44
L_{AFmax}	58	54	54	53	56	46	67	51	68

5.4.2. **Monitoring Position 2**

A chart detailing the measured equivalent ($L_{Aeq,\ 2\ minutes}$), maximum ($L_{AFmax,\ 2\ minutes}$) and background ($L_{A90,\ 2\ minutes}$) noise levels over the survey period is provided below.

Chart 2: Measured levels over time at MP2 (façade levels)



The table below details the measured daytime equivalent ($L_{Aeq,\ 16\ hour}$), night time equivalent ($L_{Aeq,\ 8\ hour}$) and night time maximum (L_{AFmax}) noise levels over the full survey period converted into free-field noise levels. The noise levels below are considered representative of the levels at the proposed southern façades.

Table 6: Measured daytime and night time noise levels at MP2 (free field levels)

Parameter	**Sound Pressure Level (dB) per Octave Band (Hz)**								**dBA**
	63	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**	
$L_{Aeq,\ 16\ hour}$	54	48	50	50	53	42	34	26	54
$L_{Aeq,\ 8\ hour}$	42	42	43	45	40	35	27	11	45
L_{AFmax}	72	64	63	63	65	59	48	40	67

6. Noise Exposure Category

The free-field levels due to road traffic at the worst-case façade (south) are 54 dB $L_{Aeq, 16hour}$ during the day and 45 dB $L_{Aeq, 8hour}$ during the night. Based on the measured levels above, the NEC due to road traffic at the development would fall into category 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.*"

The 10th highest max (as per WHO Guidelines on Community Noise, 1999) measured at the worst-case façade was 68 dB L_{AFmax}. This does not affect the noise exposure category for the site.

As noise levels fall into Exposure Category A, no specific noise control measures are required. This applies for both normal ventilation conditions and under over heating conditions.

In the event of overheating and noise requiring consideration, the measured noise data indicates that noise levels within bedrooms would fall within ADO criteria noted above.

7. Summary and Conclusions

Merthyr Valley Homes appointed Acoustic Consultants Limited to carry out an environmental noise assessment for the proposed residential development in in Merthyr Tydfil.

A noise survey was carried out to determine environmental noise levels at the site, representative of the proposed facades of the residential development.

Measured noise levels fall into the NEC 'A' of TAN11 and therefore, no specific noise control measures are required.

As such, the proposals at the site and detailed in this report achieve the aims of the Planning Policy Wales (PPW) to "*minimise the adverse impact of noise without placing unreasonable restrictions on development or adding unduly to the costs and administrative burdens of business"* via good acoustic design.

8. Appendix 1 – Glossary of Acoustic Terminology

A-weighted sound pressure pA – 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 µPa)

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 = t2 – t1, has the same mean-squared sound pressure as a sound that varies with time, and is given by the following equation:

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

where:

p_0 is the reference sound pressure (20 µPa); 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, $L_s = L_{Aeq,Tr}$ – 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, $L_{Ar,Tr}$ – 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).

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