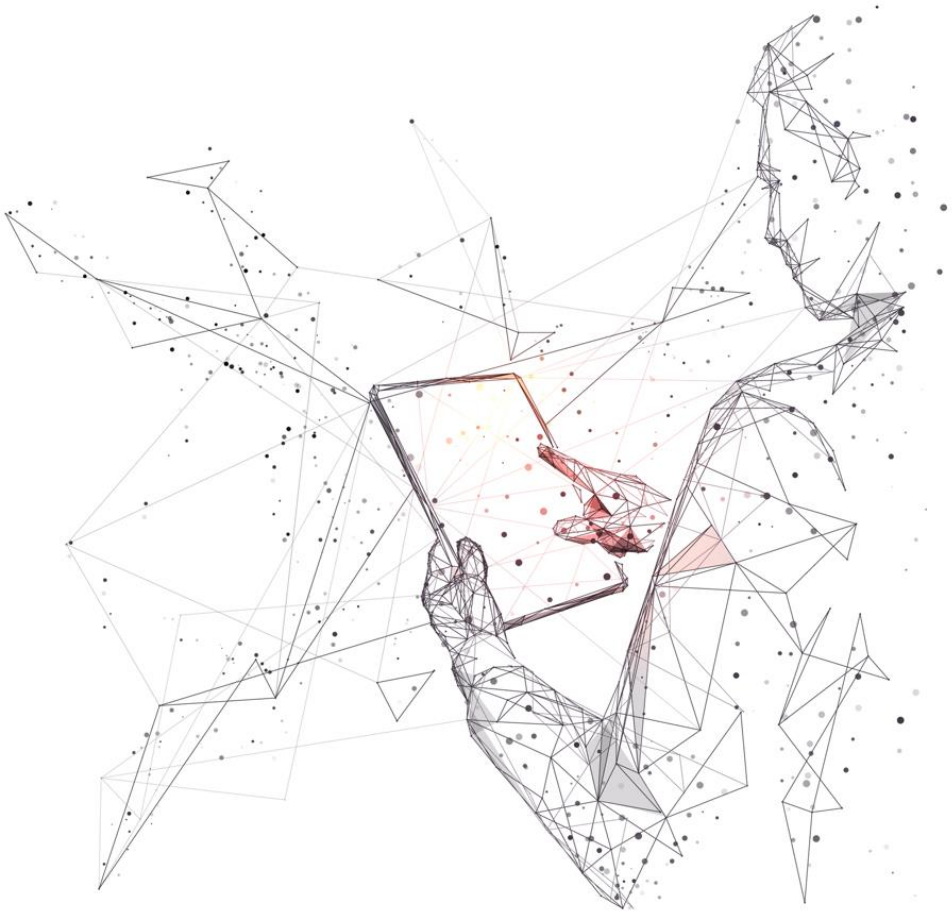
MARCH 11, 2025



NOISE IMPACT ASSESSMENT OF ENGEDI CHAPEL AND METHODIST CHURCH, HIGH STREET, BRYMBO, WREXHAM, LL11 5BL

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1.0 Introduction

1.0.1 This report has been commissioned to determine the environmental noise impact upon a proposed residential development on High Street, Brymbo, Wrexham. The assessment has been conducted in-line with BS8233.

1.0.2 A public house, Miners Arms, is opposite the site with external seating overlooking the proposed development, a BS4142 assessment has been completed to consider the impact of the pub on the proposed residential development, to determine the likelihood of complaints from new residents when the development is complete.

2.0 Site Details

2.0.1 The site, located at Engedi Chapel and Methodist Church, High Street, Brymbo, Wrexham, LL11 5BL, is proposing the demolition of the existing buildings and construction of 2 new residential blocks of flats.

2.0.2 The residential blocks will be 2-storeys of residential, with one block having a ground floor, covered car park, making it 3-storeys in total.

2.0.3 The site is within a built-up environment with residential properties to the north, east and south, the public house, Miners Arms, is also to the east, shown in Figure 1.

2.0.4 More residential properties are to the west, but the topography changes with a dramatic height increase, and these residentials to the west are not visible from the site.

2.0.5 The main road, High Street, runs north to south along the site's eastern boundary.

Figure 1: Proposed Site Location

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3.0 Survey

3.0.1 A survey that comprised of two unattended meters, commenced on 14th February 2025 at approximately 11:00 and was completed by 17th February at 15:40.

Figure 2 shows the location of the noise measurement position (NMP) in yellow.

Figure 2: Site Location



3.0.2 The monitoring was conducted using 2 x Type 1 NTi XL2 sound level meters with batteries and outdoor microphone protection.

3.0.3 Measurements were made in 15-minute periods, on 1 second averaging, to allow for the removal of anomalies and increased accuracy.

3.0.4 All measurements were taken after a field calibration was undertaken to ensure accuracy and repeatability of measurements. Checks were also made post measurement for drift in order to validate the data collected.

3.0.5 Further data such as wind speed, wind direction, rainfall intensity, temperature and cloud cover were all recorded at the beginning and end of the assessment at the monitoring location,

Figure 4: Graphical view of measured data (NMP2)

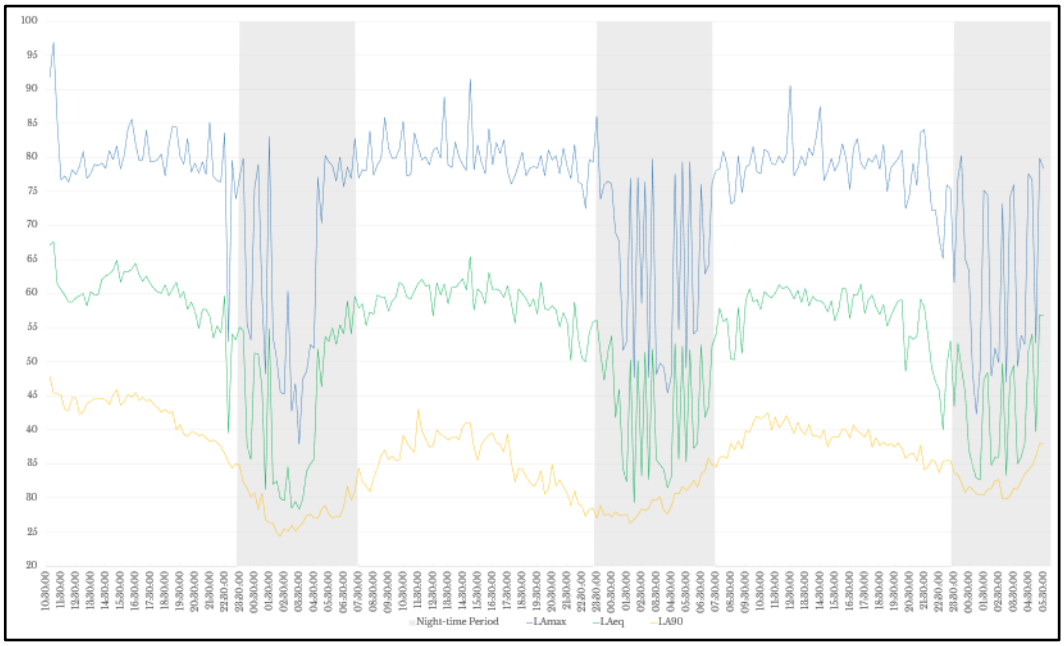


Table 3.

3.0.6 Any anomalies (such as noise by the engineer during setup and collection of the kit) were removed from the survey for a true reflection of the ambient levels in the vicinity for the assessment.

3.1 Survey Results

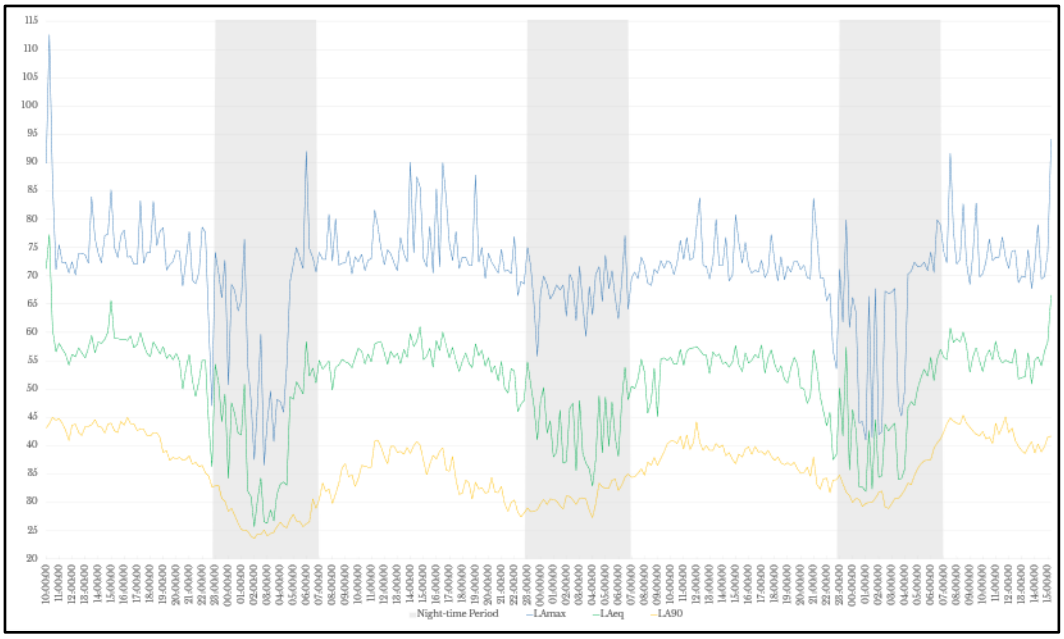
3.1.1 Table 1 & Figure 3 provides a summary of the measured data from NMP1, and Table 2 & Figure 4, a summary of the measured data from NMP2;

Table 1: Summary of measured data (NMP1)

Time Period	L_{Aeq_Tmin}	L_{A90}	L_{Amax}

		(Average)	(Representative)	(10th Highest)
Friday 14th Feb 2025	Day 11:00-23:00	57.5	44	--
	Night 23:00-07:00	48.9	25	71
Saturday 15th Feb 2025	Day 07:00-23:00	55.8	40	--
	Night 23:00-07:00	46.9	31	70
Sunday 16th Feb 2025	Day 07:00-23:00	54.4	39	--
	Night 23:00-07:00	49.8	31	70
Monday 17th Feb 2025	Day 07:00-15:40	57.5	42	--

Figure 3: Graphical view of measured data (NMP1)

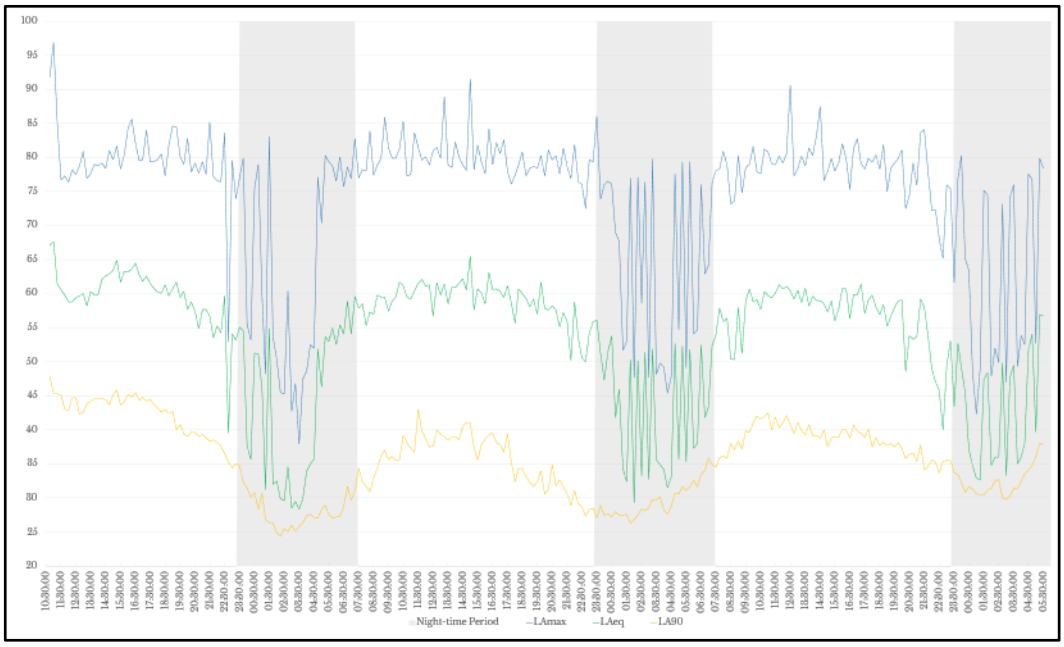


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Table 2: Summary of measured data (NMP2)

Time Period		L_{Aeq_Tmin} (Average)	L_{A90} (Representative)	L_{Amax} (10th Highest)
Friday 14th Feb 2025	Day 11:00-23:00	60.7	45	--
	Night 23:00-07:00	51.2	27	77
Saturday 15th Feb 2025	Day 07:00-23:00	59.6	39	--
	Night 23:00-07:00	49.6	28	77
Sunday 16th Feb 2025	Day 07:00-23:00	58.1	39	--
	Night 23:00-07:00	49.5	31	75

Figure 4: Graphical view of measured data (NMP2)



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Table 3: Weather **based on Appendix C*

Time Period	Cloud Cover	Temperature (Celcius)	Prescence of fog/snow/ice	Wind Speed (m/s)	Wind Direction
Installation	**7**	**4**	**No**	**2.7**	**SE**
Collection	**7**	**3**	**No**	**0.7**	**SSE**

4.0 Legislation - National Planning Practice Framework

4.0.1 The Planning Policy Wales sets out the Government's economic, environmental and social planning policies. Section 3.22 states;

"*Planning authorities should develop and maintain places that support healthy, active lifestyles across all age and socio-economic groups, recognising that investment in walking and cycling infrastructure can be an effective preventative measure which reduces financial pressures on public services in the longer term. The way a development is laid out and arranged can influence people's behaviours and decisions and can provide effective mitigation against air and noise pollution.*"

4.0.2 The guidance also sees traffic consideration and management as key when it comes to noise impact assessments. Section 4.1.45 states

"*Local authorities must adopt an integrated approach to traffic management. They should consider how different measures can complement one another and contribute to the achievement of wider planning and transport objectives, implementing the Active Travel Act and reducing exposure to air and noise pollution, taking into account the needs of the disabled and less mobile sections of the community.*"

4.0.3 Section 6 of the document also tackles the likely social and well-being impacts of the preservation of 'distinctive and natural places'. Section 6.7.1 refers to the need to protect the soundscape of areas;

"*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.*"

This is then continued in reference to noise in section 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."

4.0.4. It is possible to apply objective standards to the assessment of noise and the effect produced by the introduction of a certain noise source may be determined by several methods, as follows:

- The effect may be determined by reference to guideline noise values. British Standard (BS) 8233:2014 and World Health Organisation (WHO) "Guidelines for Community Noise" contain such guidelines.

Another method is to compare the resultant noise level against the background noise level (L_{A90}) of the area. This is the method employed by BS 4142:2014 to determine the likelihood of complaint from noise of an industrial nature. It is best suited to the assessment of steady or pseudo-steady noise.

4.1 BS4142:2014 +A1 (2019)

4.1.1 Noise effects on residential properties due to the current operational hours and extended hours have been assessed according to the guidance in BS 4142:2014. This standard primarily provides a numerical method by which to determine the significance of sound of an industrial nature (i.e. the 'specific sound' from the proposed development) at residential sensitive receptors.

4.1.2 The specific sound level may then be corrected for the character of the sound (e.g. perceptibility of tones and/or impulses), if appropriate, and it is then termed the 'rating level', whether or not a rating penalty is applied. The 'residual sound' is defined as the ambient sound remaining at the assessment location when the specific sound source is suppressed to such a degree that it does not contribute to the ambient sound.

4.1.3 According to BS 4142:2014, the background sound levels adopted for the assessment should be representative of the periods being assessed. The standard recommends that the background sound level should be collected from continuous measurements of normally not less than 15-minute intervals. However, the Standard states that there is no 'single' background sound level that can be derived from such measurements. It is particularly difficult to determine what is 'representative' of the night-time period because it can be subject to a wide variation in background sound levels between the shoulder night periods.

4.1.4 The method chosen for this section of the report is to use the data collected at the nearest NSR for the day and night periods to provide the ambient and background noise levels. The mode $L_{Aeq_1hr(Day)}$ and $L_{Aeq_15min(Night)}$ value will then be used for each time period over the course of the measurement as the most appropriate way of creating a representative value.

4.1.5 The specific sound levels have been determined separately in terms of the L_{Aeq1hr} during the daytime $L_{Aeq15min}$ during the night-time. Daytime is typically between 07:00 and 23:00 hours and night-time is typically between 23:00 and 07:00 hours, so these periods have been adopted for this assessment.

4.1.6 At each of the most likely sensitive receptor locations, the rating level has been determined from the predicted specific sound level. Where it has considered it to be appropriate, a rating penalty has been applied for tonality, impulsivity and/or intermittent specific sounds as described in the commentary to paragraph 9.2 of BS4142:2014. This has been applied with consideration for the main sound sources from site that contribute to the level of specific sound at the receptor location.

4.1.7 As per the requirements of the standard, an initial estimate of the impact of the specific sound has been obtained by subtracting the measured background sound level from the rating level of the specific sound. Table 2 provides the initial evaluation of impact following this method.

Table 4

Magnitude	Difference Between rating Level and Background Level	Comments
High	**+10dB**	**Significant Adverse impact Likely**
Medium	**+5 to +10dB**	**Adverse impact Likely**
Low	**0 to +5 dB**	**Adverse impact unlikely**
Negligible	**Less than 0dB**	**Low chance of Adverse Impact**

4.1.8 Following the initial evaluation of impact, the context of the sound has also been considered, which is a key requirement of the Standard. In evaluation of the context, the following factors have been considered:

- the absolute level of the sound;
- the character and level of the residual sound compared to the character and level of the specific sound and

- the sensitivity of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions.

4.2 BS8233 Guidance on Sound Insulation and Noise Reduction for Buildings

1. The scope of this standard is the provision of recommendations for the control of noise in and around buildings. It suggests appropriate criteria and limits for different situations, which are primarily intended to guide the design of new buildings or refurbished buildings undergoing a change of use, rather than to assess the effect of changes in the external noise climate. The standard suggests suitable internal noise levels within different types of buildings, including dwellings, as shown in Table below.

Table 5: BS8223 recommended internal noise levels

Activity	Typical Situation	Design Target $L_{Aeq,T}$ (dB)	
		Daytime (07:00-23:00)	Night-Time (23:00-07:00)
Suitable resting/sleeping conditions	Living Room	35	-
	Bedroom	35	30
Dining	Dining room	40	-

4.2.2 BS8233 goes on to recommend noise levels for external amenity spaces (i.e., gardens, balconies etc). According to BS8233;

"It is desirable that the external noise level does not exceed 50 dB LAeq,T, with an upper guideline value of 55 dB LAeq,T which would be acceptable in noisier environments. However, it is also recognised that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors might be warranted."

4.2.3 BS8233 goes on to say:

In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces but should not be prohibited.

4.3 Building Regulations Approved Document O: Overheating

4.3.1 Approved Document O of the Building Regulations 2010 Overheating (ADO) concerns ventilation and overheating requirements in dwellings.

4.3.2 Requirement O1(2)(a) concerns the maximum acceptable noise levels in homes during overheating scenarios. These represent a 10 dB relaxation on the noise levels set out in BS8233 and WHO Guidelines that apply in non-overheating scenarios. Table sets out these limits.

Table 6: Internal noise level limits in overheating scenarios

Location	Time	Noise limits in overheating conditions
Bedroom	Daytime (07:00-23:00)	$L_{Aeq,16h}$ 45 dB
	Night (23:00-07:00)	$L_{Aeq,8h}$ 40 dB L_{AFmax} 55 dB not exceeded more than 10 times per night

4.4 World Health Organisation's Guidelines for Community Noise

4.4.1 The WHO Guidelines for Community Noise offers advice with regard to setting noise criteria applicable to sleep disturbance. Section 4.2.3 specifies:

> *If the noise is not continuous, L_{Amax} or SEL are used to indicate the probability of noise-induced awakenings. Effects have been observed at individual L_{Amax} exposures of 45 dB or less. Consequently, it is important to limit the number of noise events with a L_{Amax} exceeding 45dB.*

4.4.2 The guidelines go on to state:

> *"At night, sound pressure levels at the outside façades of the living spaces should not exceed 45 dB LAeq and 60 dB LAmax, so that people may sleep with bedroom windows open. These values have been obtained by assuming that the noise reduction from outside to inside with the window partly open is 15 dB."*

4.4.3 The sound insulation performance value of 15 dB for a façade containing a partially open window accords with the guidance offered in BS8233. The guidelines reference a study by Vallet & Vernet, which concluded that:

> *"For a good sleep, it is believed than indoor sound pressure levels should not exceed approximately 45 dB L_{AFmax} more than 10-15 times per night."*

4.4.4. Accordingly, this assessment has utilised the 10th highest measured maximum noise level from the night-time period and allows for an assessment of a typical maximum noise level in determining façade sound insulation performance.

4.5 TAN 11: October 1997

4.5.1 The Technical Advise Note (Wales) 11, Noise – October 1997 provides some further criteria in relation to noise criteria categories for Noise-sensitive developments. These categories have been derived to assist local planning authorities in their consideration of planning applications. These categories are part of Annex A of the guidance document and are displayed in the tables below.

"Local planning authorities should consider whether proposals for new noise-sensitive development would be incompatible with existing activities, taking into account the likely level of noise exposure at the time of the application and any increase that may reasonably be expected in the foreseeable future. Such development should not normally be permitted in areas which are, or are expected to become, subject to unacceptably high levels of noise and should not normally be permitted where high levels of noise will continue throughout the night."

Table 2: RECOMMENDED NOISE EXPOSURE CATEGORIES FOR NEW DWELLINGS NEAR EXISTING NOISE SOURCES

Noise Levels[1] corresponding to the Noise Exposure Categories for New Dwellings $L_{Aeq,T}$dB					
Noise Source		Noise Exposure Category			
		A	B	C	D
road traffic	0700-2300	<55	55-63	63-72	>72
	2300-0700[2]	<45	45-57	57-66	>66
rail traffic	0700-2300	<55	55-66	66-74	>74
	2300-0700[2]	<45	45-59	59-66	>66

TABLE 1: NOISE EXPOSURE CATEGORIES	
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.
B	Noise should be taken into account when determining planning applications and, where appropriate, conditions imposed to ensure an adequate level of protection.
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.
D	Planning permission should normally be refused.

5.0 Assessment

5.1 CadnaA Modelling

5.1.1 A CadnaA model was built to predict noise levels at the façade of the proposed residential blocks, and results from this model can be found in Appendix D.

5.1.2 Table 7 shows values used to calibrate the noise model. Where it wasn't possible to calibrate noise levels at both receptors to the noise levels shown, the higher of the levels was taken to provide a worst-case scenario.

Table 7: Calibration levels used in noise model, $L_{AEQ,T}$ (dB)

Location	Day (L_{AEQ})	Night (L_{AEQ})	Max (L_{AMAX})
NMP1	57	49	70
NMP2	60	50	76

5.1.3 Noise levels from the Miners Arms were assessed for indication of the noise source, it was determined that the noise levels measured at NMP1 was dominated by road traffic and not from noise break-out from the Miners Arms. Therefore a further BS4142:2014 assessment was not deemed necessary. The highest L_{Aeq_15min} period that contained any form of external noise from the pub was measured at 37dBA (when the pass-by traffic noise was removed from the same period). This consisted of low-level speech, likely during smoking externally from the public house. There was no audible music or any noise of an industrial nature emanating from any of the surrounding buildings that would also require the BS4142:2014 assessment to be conducted. It can therefore be concluded that any industrial, pub or patron noise is at least 10dBA below background and will not

5.1.4 Road (High Street) and Miners Arms noise data used for the different assessment periods are shown in table 8. Corrections were applied to calibrate noise levels as per the values in Table 7.

Table 8: Measured sound levels of High Street and local public house

Source Type	1/3 Octave Spectrum (dB)								
	31.5	**63**	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**
Road Day	15.1	30.3	35.4	40.9	44.4	48.8	48	47.6	38.5
Road Night	5.1	16.8	22.9	29.4	33.7	39.3	38.2	32.7	29.8
Road Max	28.5	41.6	46.1	52.1	57.5	62.4	66.5	61.9	60.6
Pub Day	88.5	89.3	82.5	82.9	80.1	83	78.3	69.3	64.4
Pub Night	82.8	78.5	72.9	73	71.8	74.6	70.6	61.9	57.8

5.2 Internal Noise Impact for Proposed Dwellings (Non-overheating scenarios)

5.2.1 In order to accurately determine the noise level within habitable rooms, noise levels at the façades have been calculated in the noise model for the proposed layout.

5.2.2 Table 13 of BS6262-2 suggests that a standard double-glazing unit with configuration 4mm glass/12mm cavity/4mm glass affords a sound insulation performance in the order of R_w 29 dB; however, this is for a pink noise spectrum. The same unit, weighted for road traffic noise using the '+

C_{tr}' correction, has a sound insulation performance of approximately R_w + C_{tr} 25 dB and so this value, along with the attenuation values for further glazing configurations, has been used to determine internal noise levels.

5.2.3 BS8233 also recommends that a partially open window provides approximately 15 dB attenuation, and this value is also used in the following.

5.2.4 In order to achieve the noise criteria stated within the BS8233 and WHO Guidelines for bedrooms and living areas, a range of glazing specifications are required. Appendix D presents the minimum glazing sound insulation performance required to achieve the WHO's noise criteria across each façade.

Table relates this to a typical glazing configuration and ventilation strategy for achieve this.

5.2.5 Where trickle vents are required, these should have a sound insulation performance of $D_{n,e,w}$ + C_{tr} greater than or equal to the performance of the window in which it is installed. This assumes one vent will be installed per window.

Table 9: Typical glazing configuration and sound insulation requirements

Sound insulation performance R_w + C_{tr} (dB)	Typical glazing configuration (mm)	Ventilation strategy
<15	4/12/4	Natural ventilation/openable windows
25	4/12/4	Natural ventilation/openable windows
30	10/12/4	Attenuated passive ventilation (e.g., trickle vents)

5.3 Overheating Noise Assessment

5.3.1 Analysis of the noise model indicates that there are some locations where open windows cannot be relied upon to provide cooling in overheating scenarios, as the noise limits of ADO will be exceeded. These are indicated in Figure D1to Figure D4 in Appendix D.

5.3.2 In these locations, an alternative form of cooling will be required in overheating scenarios. Where this will be a mechanical system, the noise generated by the system must also be assessed.

5.4 External Amenity

5.4.1 The predicted noise levels in the gardens of the new properties will be below $L_{Aeq,16h}$ 50dB dB for the resident terrace without any mitigation measures required.

5.4.2 Figure D5 in Appendix D shows a 5.5m high noise map to represent the noise levels in the external space proposed over the roof of the plant room.

6.0 Conclusion

6.0.1 E2 Consultants Ltd were commissioned to undertake a noise impact assessment to support a planning application for the site at High Street, Brymbo, Wrexham, LL11 5BL.

6.0.2 Environmental noise surveys have been completed to quantify the prevailing noise environment at the boundary of the site. The dominant noise source for the area is the road traffic. The report determined that there was no noise impact from the nearby public house, patrons or sources of an industrial nature that would require the report to be extended to cover BS4142:2014, or that would cause adverse impact on the proposed development.

6.0.3 This noise survey has been used to develop a 3D computer model of noise propagation across the site including all significant noise sources and with full topography, and to inform a scheme of mitigation measures required to ensure a commensurate level of protection against noise for future occupants.

6.0.4 This assessment has shown that, in principle, the proposed development would meet the regulations for acoustic performance in accordance with BS8233:2014.

6.0.4 Accordingly, appropriate consideration has been given towards the mitigation measures required to ensure that the internal ambient noise level requirements set out in BS8233 can be met for the development. A range of double-glazing configurations from $R_w + C_{tr}$ <15 dB to $R_w + C_{tr}$ 30 dB would be required to control noise break-in from external sources and achieve the requirements of BS8233 and ADO.

6.0.5 A number of plots are predicted to exceed the noise levels set out in Approved Document O *Overheating* for bedrooms at night. Open windows should not be relied upon as the standard means of cooling for overheating scenarios in these locations.

6.0.6 The assessment is based upon robust and worst-case assumptions and demonstrates that, in principle and subject to the incorporation of the identified mitigation measures, there should be no adverse impact at the

proposed or dwellings as a result of existing noise. The site is suitable for the promotion of residential development.

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8.0 Credentials

3.5.1. Name	Title	Credentials
James Flitton BSc AMIOA	**Acoustic Consultant**	**CSCS Professionally Qualified person**
		Associate Member Institute of Acoustics
		Diploma in Acoustics and Noise Control
		Affiliate Member of IDE
Signed		

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Appendix A – Acoustic Terminology

Parameter	Description
Ambient Noise Level	The totally encompassing sound in a given situation at a given time, usually composed of a sound from many sources both distant and near ($L_{Aeq,T}$).
Decibel (dB)	A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds s1 and s2 is given by 20 log10 (s1/s2). The decibel can also be used to measure absolute quantities by specifying a reference value that fixes one point on the scale. For sound pressure, the reference value is 20μPa. The threshold of normal hearing is in the region of 0 dB and 140 dB is the threshold of pain. A change of 1 dB is only perceptible under controlled conditions.
dB(A), L_{Ax}	Decibels measured on a sound level meter incorporating a frequency weighting (A weighting) which differentiates between sounds of different frequency (pitch) in a similar way to the human ear. Measurements in dB(A) broadly agree with people's assessment of loudness. A change of 3 dB(A) is the minimum perceptible under normal conditions, and a change of 10 dB(A) corresponds roughly to halving or doubling the loudness of a sound. The background noise in a living room may be about 30 dB(A); normal conversation about 60 dB(A) at 1 metre; heavy road traffic about 80 dB(A) at 10 metres; the level near a pneumatic drill about 100 dB(A).
Fast Time Weighting	Setting on sound level meter, denoted by a subscript F, that determines the speed at which the instrument responds to changes in the amplitude of any measured signal. The fast time weighting can lead to higher values than the slow time weighting when rapidly changing signals are measured. The average time constant for the fast response setting is 0.125 (1/8) seconds.
Free-field	Sound pressure level measured outside, far away from reflecting surfaces (except the ground), usually taken to mean at least 3.5 metres
Façade	Sound pressure level measured at a distance of 1 metre in front of a large sound reflecting object such as a building façade.
$L_{Aeq,T}$	A noise level index called the equivalent continuous noise level over the time period T. This is the level of a notional steady sound that would contain the same amount of sound energy as the actual, possibly fluctuating, sound that was recorded.
$L_{max,T}$	A noise level index defined as the maximum noise level recorded during a noise event with a period T. L_{max} is sometimes used for the assessment of occasional loud noises, which may have little effect on the overall Leq noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
$L_{10,T}$	A noise level index. The noise level exceeded for 10% of the time over the period T. L_{10} can be considered to be the "average maximum" noise level. Generally used to describe road traffic noise. $L_{A10,18h}$ is the A –weighted arithmetic average of the 18 hourly $L_{A10,1h}$ values from 06:00-24:00.
$L_{90,T}$	A noise level index. The noise level exceeded for 90% of the time over the period T. Generally used to describe background noise level.

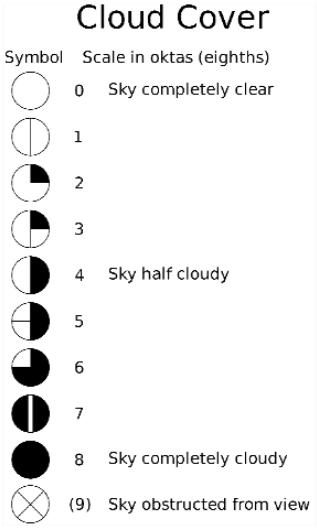
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Appendix B – Survey Instrumentation

Type	Manufacturer	Model	Serial Number	Last Cal	Cal Due
SLM	NTi	XL2-TA	A2A-18475-E0	12/11/2024	12/11/2026
Pre-amp	NTi	MA220	9378	12/11/2024	12/11/2026
Microphone	NTi	MC230A	A19093	12/11/2024	12/11/2026
Calibrator	NTi	CAL200	19829	12/11/2024	12/11/2025
SLM	NTi	XL2-TA	A2A-18928-E0	10/05/2023	09/05/2025
Pre-amp	NTi	MA220	9785	10/05/2023	09/05/2025
Microphone	NTi	MC230A	A20919	10/05/2023	09/05/2025

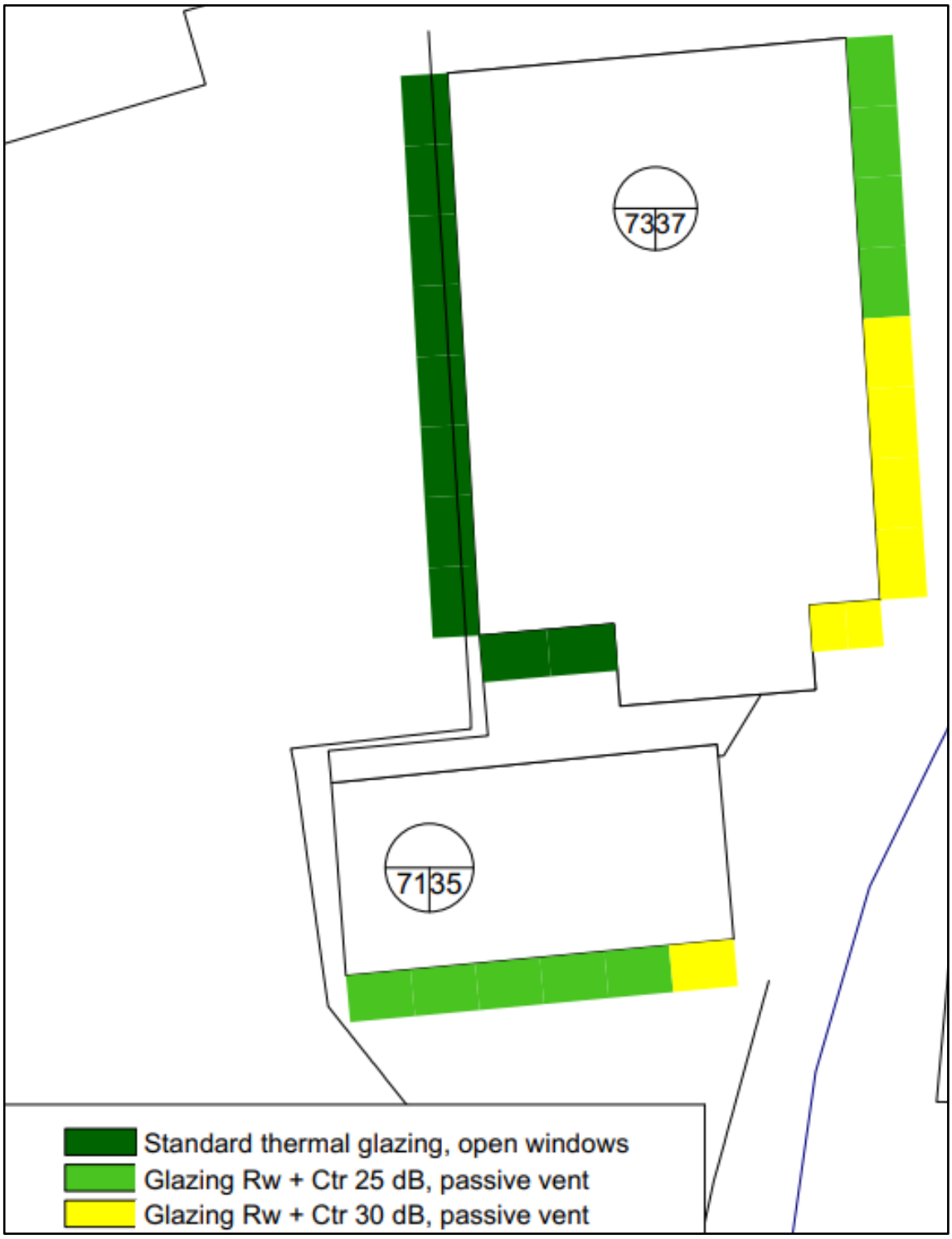
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Appendix C – Weather Conditions Chart Used

Weather Conditions				
Measurement Location	**Date/Time**	**Description**	**Beginning of Survey**	**End of Survey**
	14/02/2025 – 17/02/2025	Temperature:	4	3
		Precipitation:	No	No
		Cloud cover (oktas - see guide)	7	7
		Presence of fog/snow/ice	n/a	n/a
		Presence of damp roads/wet ground	no	no
		Wind Speed (m/s)	2.7	0.7
		Wind Direction	SE	SSE
		Conditions that may cause temperature inversion (i.e. calm nights with no cloud)		

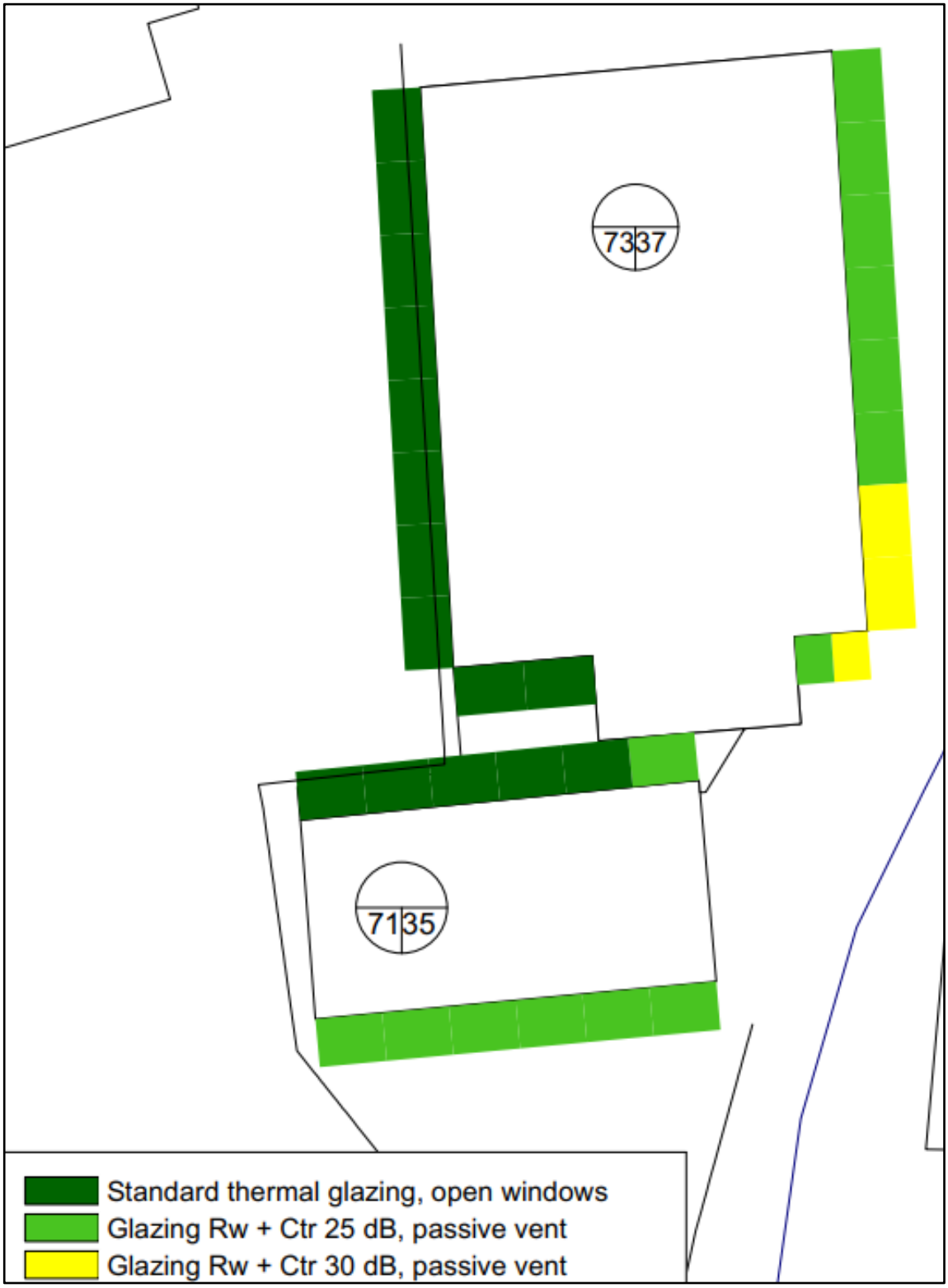
Appendix D – CadnaA Results

Figure D1: Glazing - Apartments 1-2 Ground Floor, Apartments 5-10 First Floor



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Figure D2: Glazing - Apartments 3-4 First Floor, Apartments 11-16 Second Floor



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Figure D3: Overheating: Apartments 1-2 Ground Floor, Apartments 5-10 First Floor



Figure D4: Overheating: Apartments 3-4 First Floor, Apartments 11-16 Second Floor



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Figure D5: External Amenities, External area shown in blue. 5.5m high noise map.

