Noise Impact Assessment for

Moreton Inn, Ruabon Road, Johnstown,

Wrexham,

LL14 6PU



December 2nd 2025

Prepared by:

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Table of Contents

1. Introduction
2. Development Description
3. Noise Assessment Criteria
4. Results
5. Observations and Further Discussions
6. Glazing, Structural and Ventilation Requirements
7. BS4142:2014+A1:2019 Considerations
8. Conclusion
9. Credentials

Appendix A – Acoustic Terminology

Appendix B – Certificates of calibration

Appendix C – Weather chart

Appendix D – BS8233:2014 Annex G Calcs

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1.0 Introduction

1.01 E2 Consultants have been commissioned to undertake a noise impact survey and assessment for the Moreton Inn, Ruabon Road, Johnstown, Wrexham, LL14 6PU.

1.02 The methodology used for this assessment will be BS8233:2014 as this is a new development within the designated area. BS4142:2014+A1:2019 will also be considered with the possibility of industrial noise to the rear of the proposed dwellings.

1.03 The report will also issue recommendations of acoustic performance of glazing and, if required, ventilation proposals in order for the future dwelling to meet all necessary criteria.

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2.0 Development Description

2.0.1 The proposed dwellings are located just off Ruabon Road in the south area of Johnstown, Wrexham.

2.0.2 The development consists of 9 dwellings in the current open area. Each dwelling is two-storey with external gardens as the outdoor amenity areas.

2.0.3 The main noise sources likely to disrupt the proposed building are traffic from Ruabon Road. There was no evidence of any industrial noise in the area impacting the site so a further BS4142:2014 assessment is note deemed to be necessary.

2.0.4 With the above sources in mind the monitoring took place in two areas on the proposed development in order to get a true perspective on the noise propagation across the existing site. A noise model was then created to look at any attenuation that would then be provided by the erection of the proposed dwellings. This has been done using the CadnaA noise modelling software.

2.1 Locations of Monitors

2.1.1 Two Type 1 sound level meters were installed on site; both setup on tripods in secure locations. Each was run for a period of 24hrs to cover representative façade impact levels both during the daytime and night-time periods.

2.1.2 Figure 1 & 2 shows the area where the monitors were installed. Both units were installed with the microphones extended up above the fencing to the front to make sure that existing barriers were not taken into consideration for the façade levels. The proposed garden spaces do, however, have its own fencing on the plans. This will be considered in the model if the façade levels exceed the limits proposed in BS8233:2014 and the WHO guidelines for community noise.

2.1.3 All locations are displayed on site map in figure 3

Figure 1 – front assessment location



Figure 2 – rear assessment location



2.1.4 Measurements were made in 15 minute periods, on 1 second averaging, to allow for the removal of anomalies and increased accuracy. The data was averaged into L_{Aeq_16hr} daytime and L_{Aeq_8hr} night-time with data also recorded for L_{AMax} in both day and night periods for the BS8233:2014 assessment. L_{A90} was also measured for the BS4142:2014 aspect.

2.1.5 The monitoring was conducted using 2 x Type 1 NTI XL2 sound level meter, outdoor case with batteries and outdoor microphone protection.

2.1.6 The measurements were taken by a fully qualified engineer with AMIOA status with the institute of Acoustics.

2.1.7 All measurements were taken after a field calibration was undertaken to ensure accuracy and repeatability of measurements. Drift was also checked post measurement to validate the data collected.

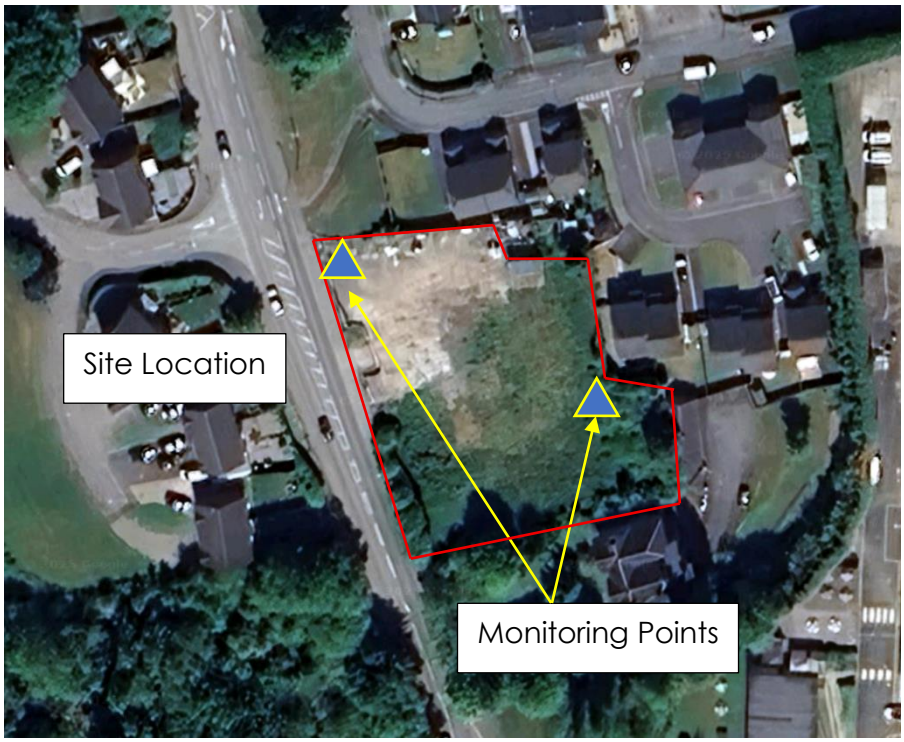
2.1.8 Further data such as wind speed, wind direction, rainfall intensity, temperature and cloud cover were all recorded at the beginning and end of the assessment at the monitoring location.

2.1.9 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. This was done by recording audio throughout the survey at each location and listening back through the files during the analysis process to confirm what was recorded manually during the survey.

2.1.10 Care was taken to inform any residents in the area that audio recording was taking place.

2.0 Plan Views of Site with Designated Work Areas

Figure 3



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2.3 Proposed Layout

Figure 4



3.0 Noise Assessment Criteria

Legislation - National Planning Practice Framework

3.0.1 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.*"

3.0.2 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."

3.0.3 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."

3.0.4. 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.

3.1 BS4142:2014 +A1 (2019)

3.1.1 Noise effects on residential properties 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.

3.1.2 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.

3.1.3 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.

3.1.4 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.

3.1.5 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.

3.1.6 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.

3.1.7 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 1 provides the initial evaluation of impact following this method.

Table 1

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**

3.1.8 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.

3.2 BS8233 Guidance on Sound Insulation and Noise Reduction for Buildings

3.2.1 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	-

3.2.2 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."

3.2.3 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.

3.3Building Regulations Approved Document O: Overheating

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

3.3.2 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

3.4World Health Organisation's Guidelines for Community Noise

3.4.1 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.*

3.4.2 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."*

3.4.3 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."*

3.4.4. 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.

3.5TAN 11: October 1997

3.5.1 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.

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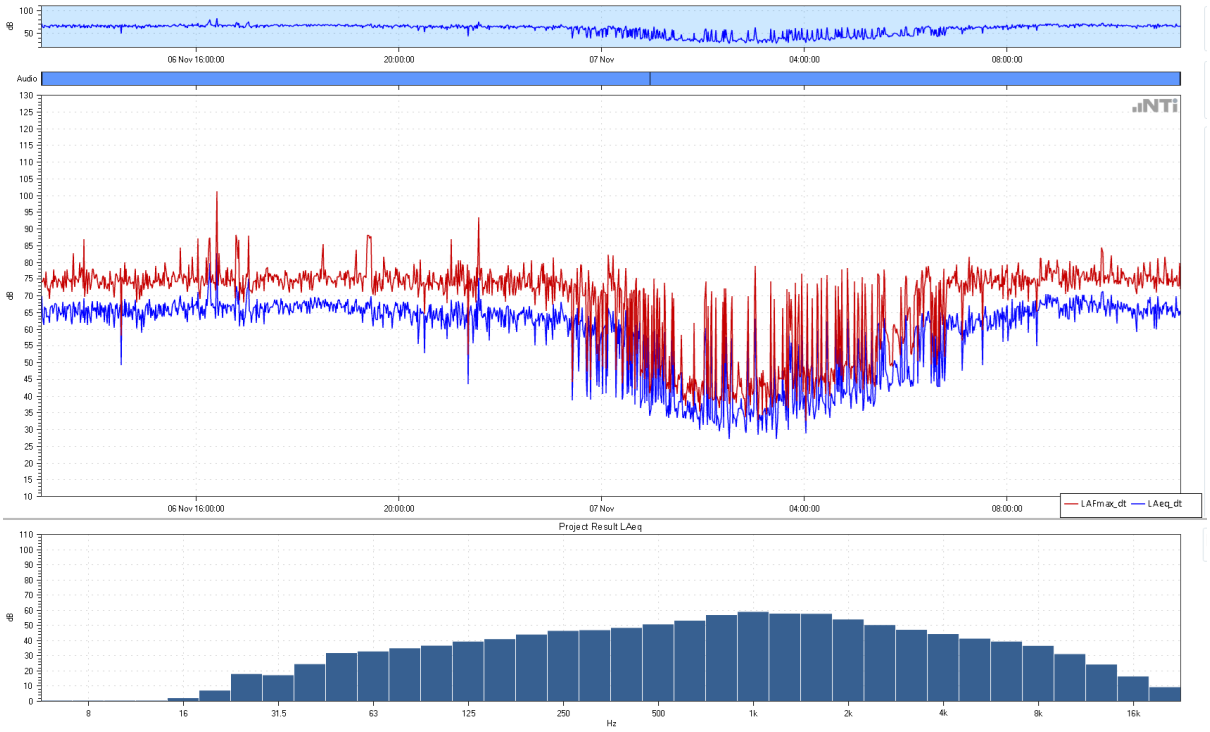
4.0 Results

4.1 Noise Assessment (Front) – 12.57pm 06/11/25 – 11.25am 07/11/25

Table 2

Location	L_{Aeq_1hr}	L_{Aeq_16hr}	L_{Aeq_15min}	L_{Aeq_8hr}	L_{Amax} (10th highest)	L_{A90}
Day	**65.7dBA**	**66.0dBA**				**50.1dBA**
Night			**54.0dBA**	**54.2dBA**	**77.8dBA**	**34.5dBA**

Figure 4



4.1.1 Comments: Mainly traffic pass-by noise. No tonal features.

Table 3

Day/Time	Cloud Cover	Temperature (Celcius)	Prescence of fog/snow/ice	Wind Speed (m/s)	Wind Direction
Installation	1	11	No	1.2	NW
Collection	3	9	No	1.7	NNW

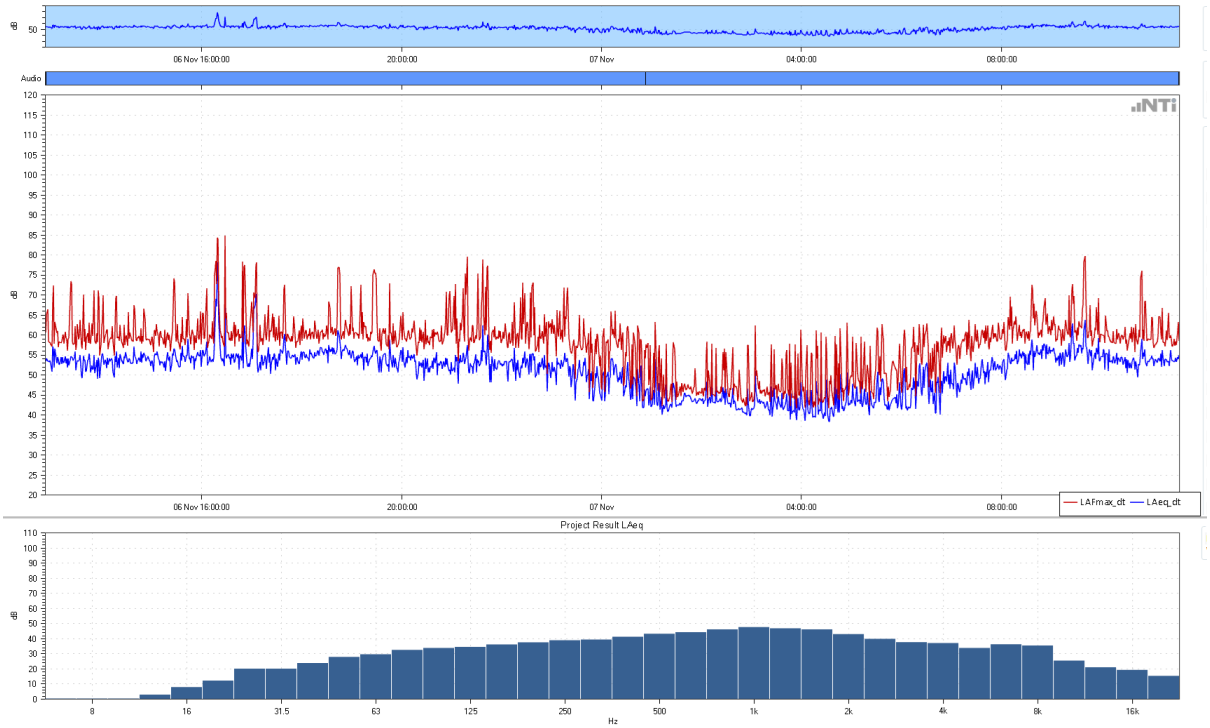
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4.2 Noise Assessment (Rear) – 12.52pm 06/11/25 – 11.33am 07/11/25

Table 4

Location	L_{Aeq_1hr}	L_{Aeq_16hr}	L_{Aeq_15min}	L_{Aeq_8hr}	L_{Amax} (10th highest)	L_{A90}
Day	**53.8dBA**	**54.7dBA**				**45.7dBA**
Night			**43.7dBA**	**46.0dBA**	**62.6dBA**	**40.8dBA**

Figure 5



4.2.1 Comments: Mainly traffic pass-by noise. No tonal features. Dog barking excluded from assessment.

Table 5

Day/Time	Cloud Cover	Temperature (Celcius)	Prescence of fog/snow/ice	Wind Speed (m/s)	Wind Direction
Installation	1	11	No	1.1	NW
Collection	3	9	No	1.9	NNW

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4.3. Noise Mapping

4.3.1 The existing background figures have been used to create a CadnaA noise model of the area. The proposed dwellings on the new site have then been added to the area so screening effects can be calculated as noise propagates across it.

4.3.2 Figure 6 shows the existing map with figure 7 showing the proposed daytime site map and noise impact levels on each of the proposed building facades. Figure 8 then shows the night-time predicted noise levels across the site post construction of the dwellings.

Figure 6 – existing noise levels across the proposed site at 1.5m



Figure 7 – Predicted Site Noise Map based on existing daytime background noise levels. Façade figures are highest values at any height.

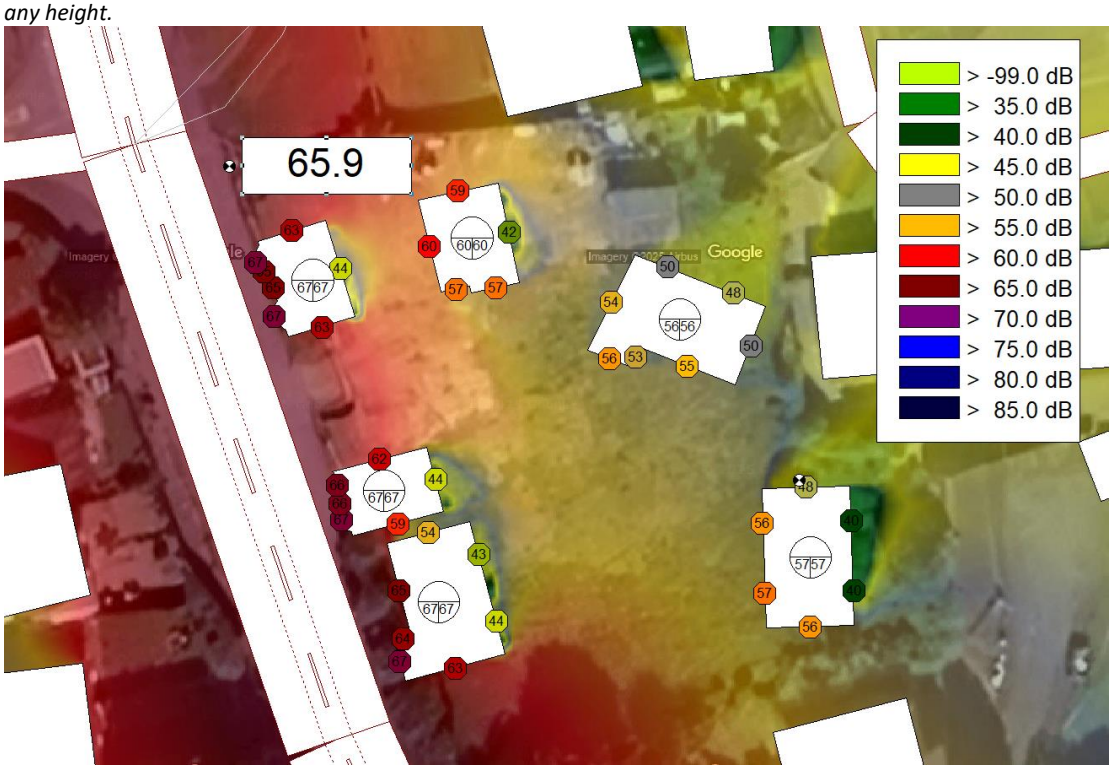
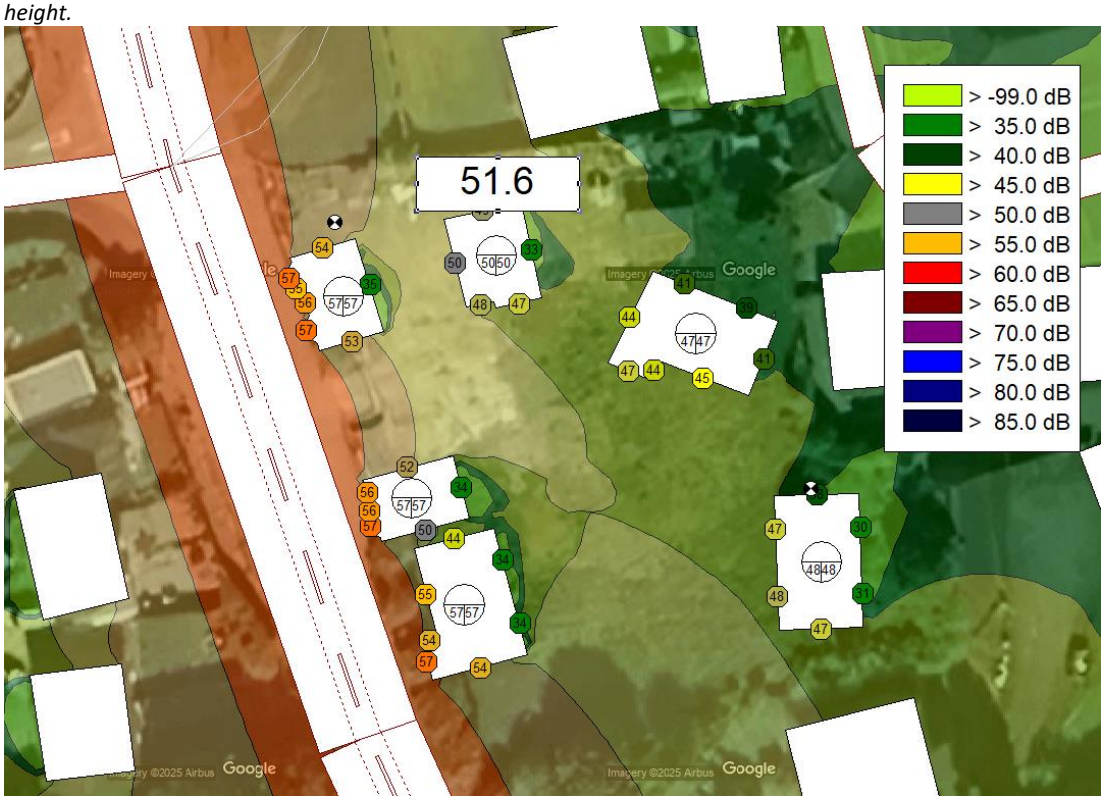


Figure 8 – Predicted Site Noise Map based on existing background noise levels. Façade figures are highest values at any height.



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4.4 Comparison of Results to BS8233

Table 6

Location	L_{AeqT} (16hr Day & 8hr Night)	L_{AMax}	BS8233 & WHO Internal noise	BS8233 & WHO External Noise	Difference to L_{Aeq} (internal/external) limit	Difference to Max (internal/external)
Plots 1, 2 7, 8 & 9 – (Front)						
Day (0700-2300)	**67dBA**		**35dBA**	**55dBA**	**(+32dBA/ +12dBA)**	**-**
Night (2300-0700)	**57dBA**	**78dBA (10th Highest)**	**30dBA (45dBA L_{AMax})**	**(60dBA L_{AMax})**	**(+27dBA)**	**(+33dBA)**
Plots 1, 2 7, 8 & 9 – (Rear)						
Day (0700-2300)	**44dBA**		**35dBA**	**55dBA**	**(+9dBA/ -11dBA)**	**-**
Night (2300-0700)	**35dBA**	**63dBA (10th Highest)**	**30dBA (45dBA L_{AMax})**	**(60dBA L_{AMax})**	**(+5dBA)**	**(+18dBA)**
Plots 3 & 4 – (Front)						
Day (0700-2300)	**56dBA**		**35dBA**	**55dBA**	**(+21dBA/ +1dBA)**	**-**
Night (2300-0700)	**50dBA**	**63dBA (10th Highest)**	**30dBA (45dBA L_{AMax})**	**(60dBA L_{AMax})**	**(+20dBA)**	**(+18dBA)**
Plots 3 & 4 – (Rear)						
Day (0700-2300)	**50dBA**		**35dBA**	**55dBA**	**(+15dBA/ -5dBA)**	**-**
Night (2300-0700)	**33dBA**	**63dBA (10th Highest)**	**30dBA (45dBA L_{AMax})**	**(60dBA L_{AMax})**	**(+3dBA)**	**(+18dBA)**
Plots 5 & 6 – (Front)						
Day (0700-2300)	**57dBA**		**35dBA**	**55dBA**	**(+22dBA/ +2dBA)**	**-**
Night (2300-0700)	**48dBA**	**63dBA (10th Highest)**	**30dBA (45dBA L_{AMax})**	**(60dBA L_{AMax})**	**(+18dBA)**	**(+18dBA)**
Plots 5 & 6 – (Rear)						
Day (0700-2300)	**40dBA**		**35dBA**	**55dBA**	**(+5dBA/ -15dBA)**	**-**
Night (2300-0700)	**31dBA**	**63dBA (10th Highest)**	**30dBA (45dBA L_{AMax})**	**(60dBA L_{AMax})**	**(+1dBA)**	**(+18dBA)**

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5.0 Observations and Further Discussions

5.0.1 The measured L_{Aeq} values for both the day and the night periods are shown in table 6. The day period for the fronts of plots 1, 2, 7, 8 and 9 are predicted to be around 32dBA above the limits set in accordance with BS8233:2014. Plots 3 & 4 are lower at 21dBA above and plots 5 & 6 at 22dBA.

5.0.2 The night value is also 27dBA above the limit for plots 1, 2, 7 and 9. Plots 3 & 4 are predicted to be 20dBA and 5 & 6 are predicted to be 18dBA above the limits set in BS8233:2014. This shows that the daytime noise impact is expected to be greater than the night-time L_{Aeq} values.

5.0.3 The rear of the plots all have reduced noise levels compared to the front facades. Plots 1, 2, 7, 8 and 9 are predicted to be 9dBA above the BS8233:2014 limits during the daytime and 5dBA during the night-time period. Plots 3 & 4 are 15dBA above limit in the daytime and 3dBA above at night. Plots 5 & 6 are predicted to be 5dBA above during the daytime and 1dBA above at night.

5.0.4 BS8233 assumes that a standard double-glazed window will provide up to 15dB reduction when open (with some council guidelines leaning on the side of caution and assuming a 10dB reduction). Either option would mean that any modern double-glazed window in the building cannot be the main source of ventilation for the front of all properties with a low chance of sleep disturbance being had by the inhabitants of the proposed dwellings. Trickle vents/acoustic vents will therefore for required throughout the proposed building to prevent overheating in accordance with document O of the building regs. The rear of the buildings, however, would be fine for windows being used as the main source of ventilation without relying on trickle vents.

5.0.5 The L_{AMax} value to prevent the likelihood of sleep disturbance is set at 60dBA external and 45dBA internal. Based on the highest value from the tenth-highest daily value measured during the week the reading for L_{AMax} night was 78dBA at the front of the proposed development and 63dBA at the rear. This value is 33dBA above the required value externally for sleep disturbance for plots 1, 2, 7, 8 and 9 but around 18dBA for the remaining plots on the site.

5.0.6 This therefore increases the required specification of windows to the front of the building for plots 1, 2, 7, 8 and 9 and will be used as the figures for the BS8233 Annex G calculation procedure to provide specific product examples for the glazing and ventilation in the proposed dwelling. The daytime L_{Aeq} comparison value will be used for the rest of the site as the highest difference value.

5.0.5 The glazing specification to the rear of the building does not take into account the screening that would be provided by the building itself. However, using the specified figures would mean that any further industrial noise increase to the rear of the proposed development would also be catered for. This is seen as the most robust method for this assessment.

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6.0 Glazing, Structural and Ventilation Recommendations

6.1 External Walls

6.1.1 External walls of the proposed building are understood to be traditional brick and block with 150mm DriTherm 32 insulation:

Table 7

Description	Octave Band Centre Frequency (Hz) Sound Reduction Index *R* dB					
	125	**250**	**500**	**1k**	**2k**	**4k**
Traditional solid 9" brick & block	39	44	51	58	63	68

6.2 Glazing

6.2.1 Suitable sound insulation performance of all windows and patio doors of the development may be achieved by using the examples provided in table 8.

Table 8– example glazing configuration

Plot Numbers	Description	Octave Band Centre Frequency (Hz) Sound Reduction Index *R* dB						Rw (C; Ctr)
		125	**250**	**500**	**1k**	**2k**	**4k**	
1, 2, 7, 8 and 9	6 mm / (16 mm argon) / 4 mm	21	20	26	38	37	39	32 (-2,-4)
3 & 4	4 mm / (6 - 16 mm) / 4 mm Pilkington	21	17	25	35	37	31	29 (-1;-4)
5 & 6	4 mm / (6 - 16 mm) / 4 mm Pilkington	21	17	25	35	37	31	29 (-1;-4)

6.3 Ventilation

6.3.1 It is anticipated that a ventilation system will be needed to be incorporated into the scheme design, such that residents of the properties are able to have background ventilation without necessarily needing to open windows.

Table 9 – example ventilation configuration

Plot Numbers	Description	Octave Band Centre Frequency (Hz) Sound Reduction Index $D_{n,e}$ dB					
		125	**250**	**500**	**1k**	**2k**	**4k**
1, 2, 7, 8 & 9	Standard acoustic trickle ventilator typically ≥ Dn,e,w 35dB	33	33	34	35	32	31
3 & 4	Standard non-acoustic trickle ventilator typically ≥ Dn,e,w 30dB	30	30	30	30	30	28
5 & 6	Standard non-acoustic trickle ventilator typically ≥ Dn,e,w 30dB	30	30	30	30	30	28

7.0 Conclusion

7.0.1 The use of the suggested configuration specification in section 6 will allow the proposed site to meet the regulations for acoustic performance in accordance with BS8233:2014.

7.0.2 The outdoor amenity spaces to the rear of the proposed dwellings are all expected to be below the 55dBA L_{Aeq_16hr} threshold set in BS8233:2014. The majority of the garden areas will also fall below the 50dBA LAeq_16hr 'desirable' threshold set in BS8233:2014.

7.0.3 The TAN Guidelines provided would mean the following categorisation of the measured data, shown in table 10.

Table 10

Plot Number	Daytime Noise Category	Night-time Noise Category
1, 2, 7, 8 & 9	C	B
3 & 4	B	B
5 & 6	B	B

7.0.4 Despite one of the areas falling into category C the mitigation measures suggested in this report would provide more than adequate consideration and attenuation for the inhabitants of the proposed dwelling to remain undisturbed by noise levels.

7.0.5 Based on the findings of this report – noise should not be considered a hindering factor when planning permission is considered providing the recommendations of this report are followed.

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8.0 Credentials

Name	Title	Credentials
James Flitton BSc AMIOA	**Acoustic Consultant**	**IOA Diploma in Acoustics and Noise Control**
		Associate Member Institute of Acoustics
		CSCS Professionally Qualified person
		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 (LAeq,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).
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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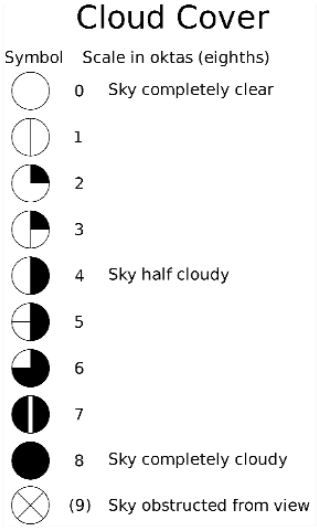
Appendix B - Noise Survey Instrumentation

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-21300-F0	21/07/2025	21/07/2027
Pre-amp	NTi	MA220	13799	21/07/2025	21/07/2027
Microphone	NTi	MC230A		21/07/2025	21/07/2027

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Appendix C – Weather Conditions Chart Used

(Blank version)

<table>
<tr><th colspan="5">Weather Conditions</th></tr>
<tr><th>Measurement Location</th><th>Date/Time</th><th>Description</th><th>Beginning of Survey</th><th>End of Survey</th></tr>
<tr><td></td><td></td><td>Temperature:</td><td></td><td></td></tr>
<tr><td colspan="2" rowspan="8">
</td><td>Precipitation:</td><td></td><td></td></tr>
<tr><td>Cloud cover (oktas - see guide)</td><td></td><td></td></tr>
<tr><td>Presence of fog/snow/ice</td><td></td><td></td></tr>
<tr><td>Presence of damp roads/wet ground</td><td></td><td></td></tr>
<tr><td>Wind Speed (m/s)</td><td></td><td></td></tr>
<tr><td>Wind Direction</td><td></td><td></td></tr>
<tr><td>Conditions that may cause temperature inversion (i.e. calm nights with no cloud)</td><td></td><td></td></tr>
</table>