BS8233 & BS3632 Assessment

Land North Of Crosfoel Court,
Wrexham,

Wrexham County,

LL14 4DR



June 26th 2025

Prepared by:

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1.0 Introduction

1.01 E2 Consultants have been commissioned to undertake a noise impact survey and assessment for proposed static homes at the Land North Of Crosfoel Court, Wrexham, Wrexham County, LL14 4DR.

1.02 The methodology used for this assessment will be BS8233 as this is a new converted development within the designated area. BS3632:2023 will also be considered as this standard covers residential park homes.

1.03 The report will also issue recommendations of acoustic performance of glazing 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 development involves the erection of 4 static carvan/lodges in the designated development area.

2.0.2 The development lies between the A483 and B5098 road in a currently vacant parcel of land. There is largely industrial premises and the Travelodge hotel to the East of the site with open fields and farmland making up the majority of the rest of the boundaries.

2.0.3 The main noise source likely to disrupt the inhabitants of the new dwellings is the traffic noise from the A483. There may be some industrial noise from the East. If that is picked up on the unattended measurements a further BS4142:2014 will be conducted. There was no evidence of this during the setting up or collecting of the equipment. The soundscape was dominated by road noise.

2.0.4 With the above sources in mind the monitoring took place in the open areas of the site close to the North & South boundaries. This was to collect the worst-case points for the background noise impacting on the proposed site once complete.

2.1 Locations of Monitors

2.1.1 Two Type 1 sound level meters were installed within the site boundary.

2.1.2 Figure 1 & 2 shows the area where the monitors were installed.

2.1.3 All locations are displayed on site map in figure 3.

Figure 1 – Odstock Rd



Figure 2- Internal plot area



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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 $L_{Aeq16hr}$ daytime and L_{Aeq8hr} night-time with data also recorded for L_{AMax} in both day and night periods for the BS8233:2014 assessment.

2.1.5 The monitoring was conducted using 2 x Type 1 NTi XL2 sound level meters, 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.

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.

2.2 Plan Views of Site with Designated Work Areas

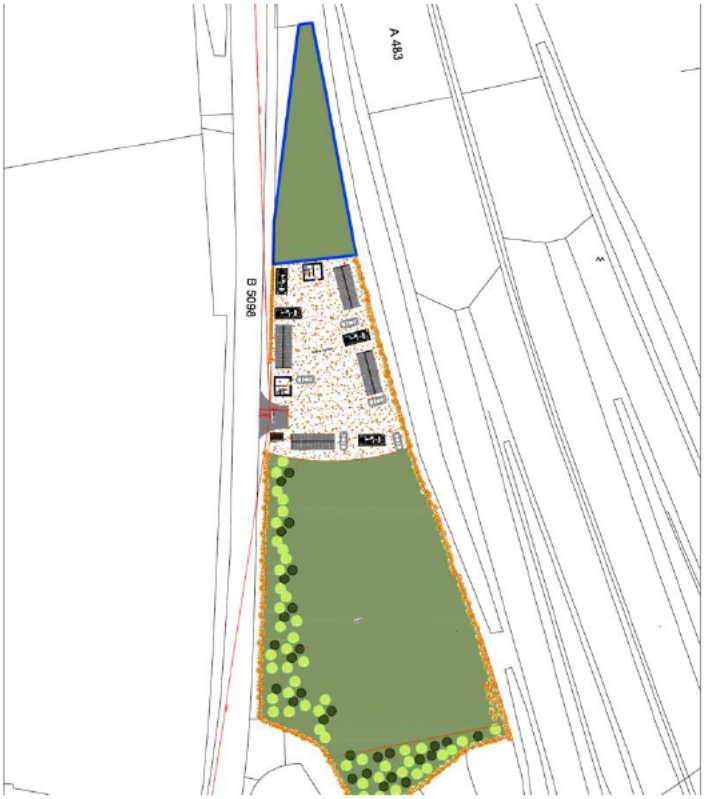
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Figure 3



2.3 Proposed Site Layout

Figure 4



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3.0 Noise Assessment Criteria

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."

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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 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**

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.

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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.*

3.3 Building 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

3.4 World 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.

3.5 TAN 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.

3.6 BS3632:2023 – Residential Park Homes Specification

3.6.1 The residential park homes specification document looks to provide details on the build type and quality that would be appropriate for use in a residential park home. This includes various specifications around design, layout and materials that can be used to achieve the required standard of living for future residents.

3.6.2 The criteria in relation to noise is very basic. Section 4.2.4 is the main reference to sound insulation specification. It states; "*To minimize the*

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transmission of airborne noise through the residential park home structure, the external wall construction (excluding doors, windows and ventilation openings) shall have a sound reduction index (R) of 33 dB over a frequency range of 100 Hz to 3 150 Hz when tested in an acoustic laboratory in accordance with BS EN ISO 10140-2."

3.6.3 This criteria will also be included in the specification of this report. The focus will be in making sure that the reduction value of 33dB is sufficient to allow the proposed dwellings to be within the 30dBA criteria for night-time levels in accordance with BS8233:2014.

4.0 Results

4.1 Northern Boundary

11.31am 21/05/26 – 10.09am 22/05/26

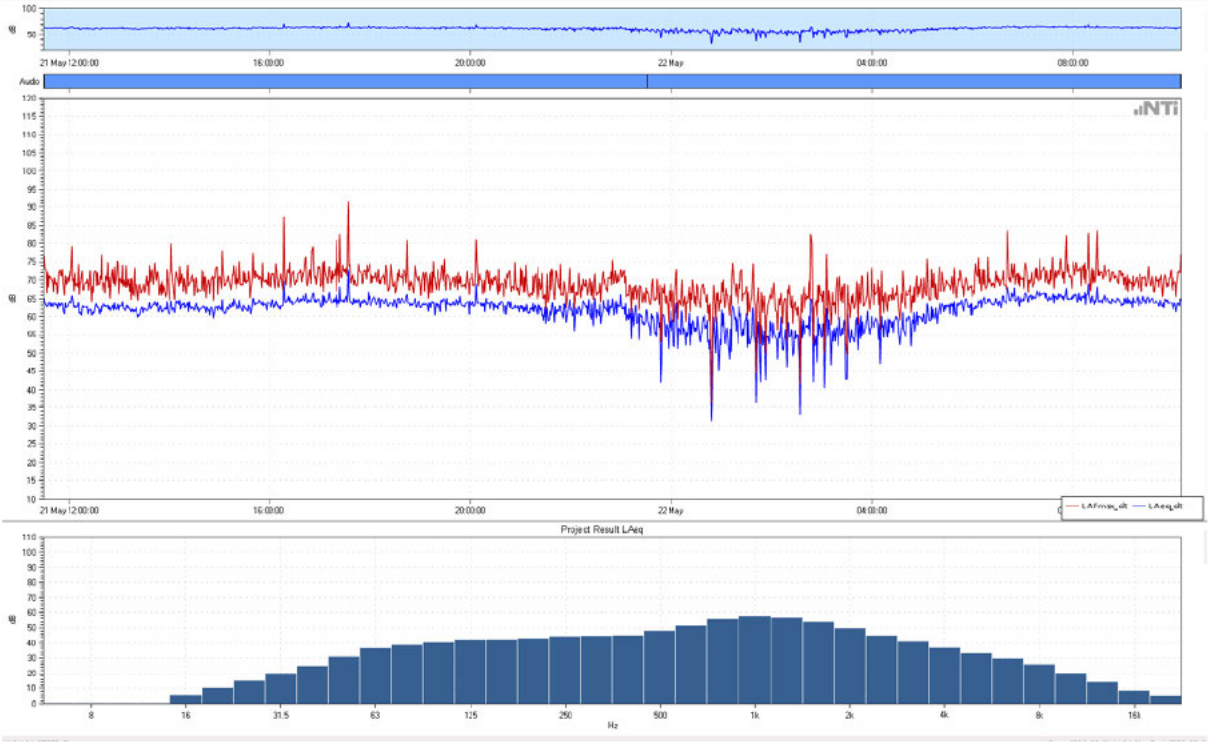
Table 2

Time Period	L_{Aeq_16hr}	L_{Aeq_8hr}	L_{A90}	L_{Amax} (10th highest)
Day	**63.5dBA**		**59.6dBA**	
Night		**58.9dBA**	**47.4dBA**	**73.7dBA**

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

Figure 5

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Day/Time	Cloud Cover	Temperature (Celcius)	Prescence of fog/snow/ice	Wind Speed (m/s)	Wind Direction
Installation	6	19	No	2.8	NW
Collection	3	17	No	3.4	W

4.2 – Southern Boundary

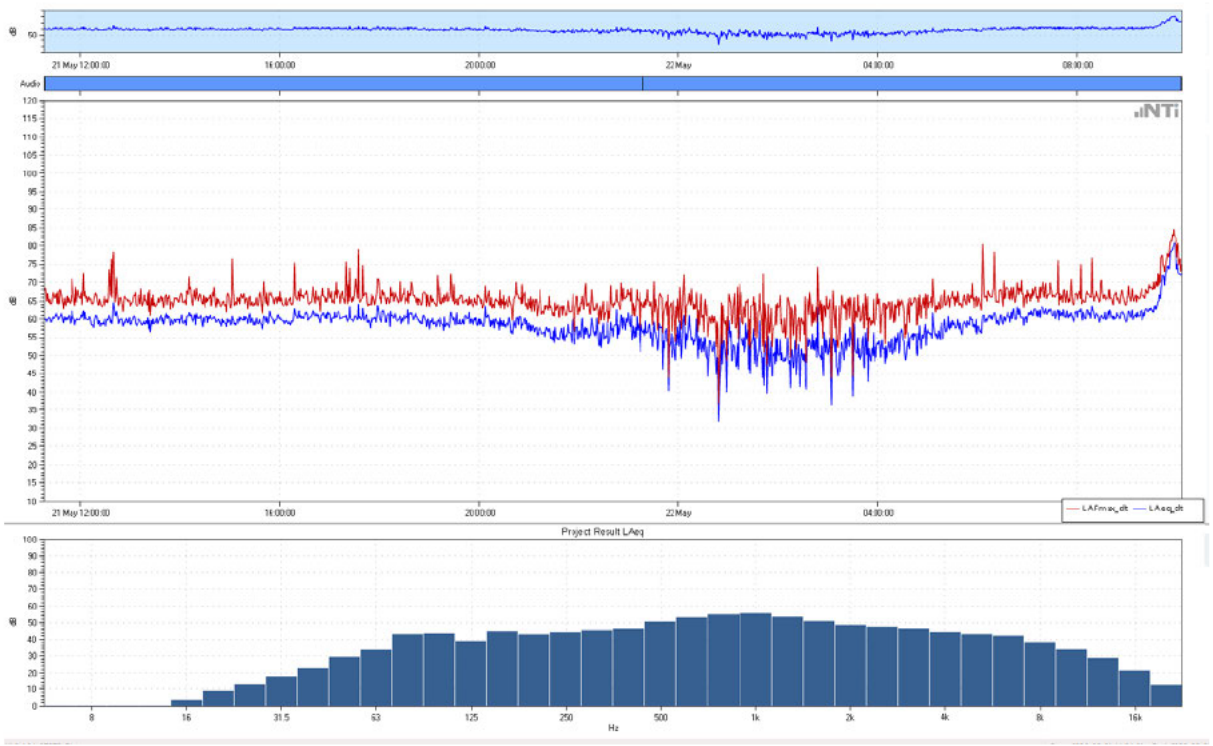
11.17am 21/05/26 – 10.05am 22/05/26

Table 3

Time Period	L_{Aeq_16hr}	L_{Aeq_8hr}	L_{A90}	L_{Amax} (10th highest)
Day	**60.3dBA**		**56.2dBA**	
Night		**54.9dBA**	**44.6dBA**	**66.7dBA**

4.2.1 Comments: Dominated by road traffic noise.

Figure 6



Day/Time	Cloud Cover	Temperature (Celcius)	Prescence of fog/snow/ice	Wind Speed (m/s)	Wind Direction
Installation	6	19	No	1.3	NW
Collection	3	17	No	0.9	W

4.3 Predicted Noise Impact

4.3.1 The measured values have been entered in the noise modelling software, CadnaA, in order to predict the noise impact across the entirety of the existing site and also for the proposed additional dwellings.

4.3.2 The predictions have been made based on a completed site and then with basic 2m fencing at the highlighted boundaries on the plan, with mixed soft and hard ground across the proposed site. Attenuation from the construction of the proposed additional dwellings has also been added into the modelling procedure.

4.3.3 Figures 7-10 show the daytime noise impact across the site based on the existing noise sources.

Figure 7 – full daytime noise-map with colour contour at 1.5m – no barrier

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Figure 8 – full daytime noise-map with colour contour at 1.5m – including 2m barrier around the site

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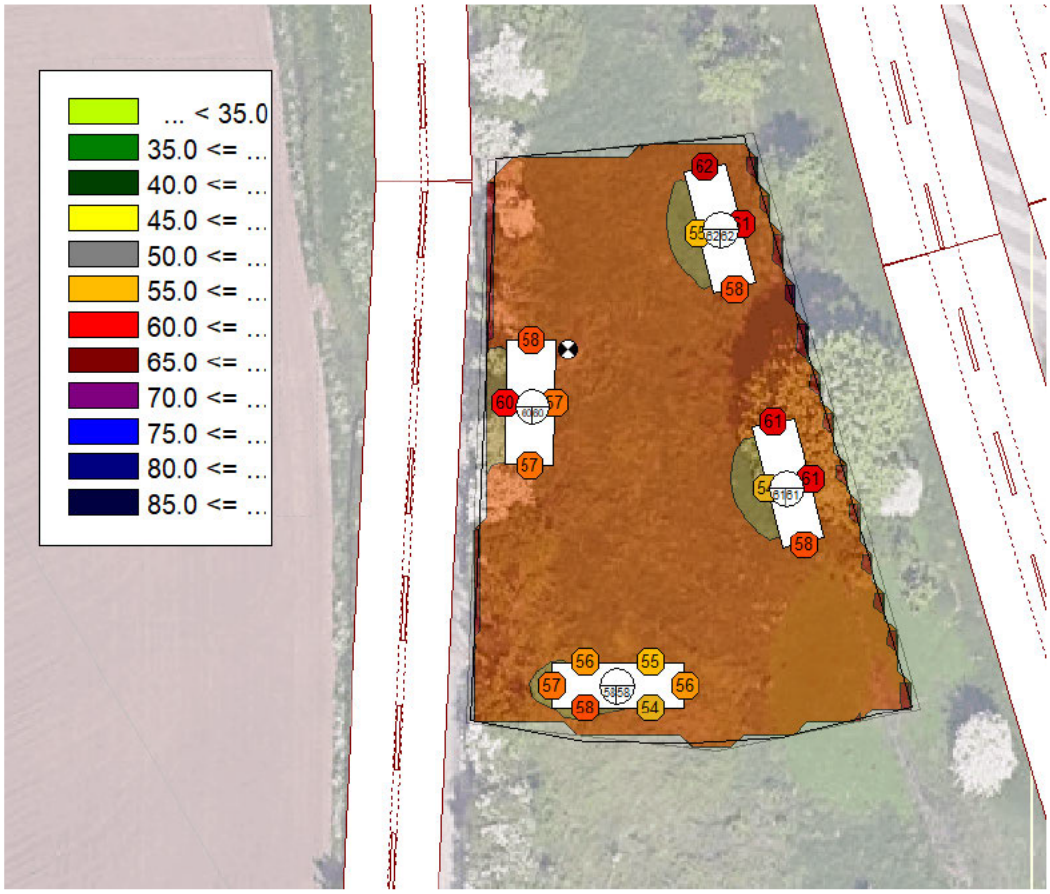


Figure 9 – full night-time noise-map with colour contour at 1.5m – including 2m barrier around the site



Figure 10 – full daytime noise-map showing noise levels for outdoor amenity areas.

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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)	Difference to Max (internal)
Site Impact						
Day (0700-2300)	59-64 dBA		35dBA	55dBA	(+24-29dBA/ +4-9dBA)	-
With 2m Fencing						
Day (0700-2300)	54-60 dBA		35dBA	55dBA	(+19-25dBA/ -1 to +5dBA)	-
Night (2300-0700)	49-55 dBA	74dBA (10^{th} Highest)	30dBA (45dBA L_{AMax})	(60dBA L_{AMax})	(+19-25dBA)	(+29dBA)

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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 BS3632:2023 standard says that there should be a 33dB reduction in the external levels from the construction of new holiday home/static caravan dwellings excluding the windows and doors. This would mean that, in order to meet the criteria for BS8233:2014 internally as well, the façade levels would have to be no more than 68dB during the daytime, and 62dBA at night. The images in figure 8 & 9 shows the NSL samples across the site for daytime and night-time. The highest noise impact is the closest properties to the road. This is 64dB before the introduction of the fencing and then a maximum of 60dBA post fencing.

5.0.2 The modelled barrier/fence area is based one a 2m high fence where the density is 10kg/m^3.

5.0.3 Looking at the values measured all areas of the site are below the required levels at the facades for both the daytime and night-time values.

5.0.4 The external daytime outdoor amenity levels, in accordance with BS8233:2014 should ideally be less than 50dBA L_{Aeq_16hr} (referred to as the 'desirable limit') but no more than 55dBA L_{Aeq_16hr} unless suitable outdoor space is provided elsewhere on the proposed site as a shared amenity space.

5.0.5 Figure10 shows the noise impact across the site as a whole.The orange area is the point at which the noise level exceeds 55dBA externally. This area is the point at which the outdoor amenity space exceeds the BS8233:2014 criteria and will require further treatment. As the majority of the area exceeds this level, even with the boundary fencing, any garden areas or outdoor amenity areas would require additional fencing to provide an enclosed area any allow levels to drop the required 2-3dB more. This could be achieved by a 1.8m fence in front of each of the static caravans or a designated area setup with fencing and seating areas to act as a communial zone.

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6.0 Glazing, Structural and Ventilation Recommendations

6.0.1 Due to the high external noise levels there needs to be a specification added for the glazing and any ventilation for the static lodges.

6.1 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 7.

Table 7

Description	**Octave Band Centre Frequency (Hz) Sound Reduction Index *R* dB**						**Rw (C; Ctr)**
	125	**250**	**500**	**1k**	**2k**	**4k**	
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 8 provides an example product specification to be used in the bedroom and living room windows.

Table 8

Description	**Octave Band Centre Frequency (Hz) Sound Reduction Index $D_{n,e}$ dB**					
	125	**250**	**500**	**1k**	**2k**	**4k**
Standard non-acoustic trickle ventilator typically ≥ Dn,e,w 30dB	30	30	30	30	30	28

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7.0. TAN11 October 1997 Assessment

7.0.1 With noise from the roads being the dominant source it is important to consider the noise categories as detailed in section 3.5. Based on the measured noise levels for the site the below categories are in effect in table 9:

Table 9 – TAN 11 Noise Categories from Road Traffic Noise

Location	Daytime Noise Category	Night-time Noise Category
East (without fencing)	C	B
West without fencing)	C	B
East (with fencing)	B	B
West with fencing)	B	B

7.0.2 As per table 9 – the external fencing will bring the site down from a category C (that would not normally be granted planning permission), down to a category B where noise 'should be taken into account and where necessary conditions imposed'.

8.0 Conclusion

8.0.1 The proposed development will be suitable in accordance with BS8233:2014 and BS3263:2023 providing the suggested mitigation measures are put into place. This will meet criteria for internal daytime and night-time values as well as the outdoor spaces.

8.0.2 This includes the installation of the glazing as specified in section 6 (or equivalent products achieving Rw29) and ventilation achieving Rw30.

8.0.3 There were no industrial noise sources present on the measurements audio, nor witnessed during setup and collection. Therefore a further BS4142:2014 assessmet was not deemed necessary.

8.0.4 With the addition of the perimeter fencing the site also reduces from a category C to a category B in accordance with TAN 11:1997.

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9.0 Credentials

Name	Title	Credentials
James Flitton BSc AMIOA	Acoustic Consultant	IOA Diploma in Acoustics & Noise Control
		Associate Member Institute of Acoustics
		CSCS Professionally Qualified person
		Affiliate Member of IDE
Signed	[redacted]	

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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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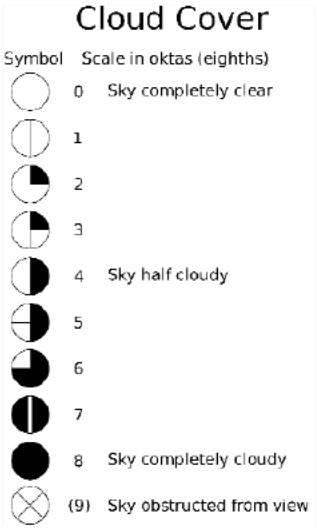
Appendix B - Noise Survey Instrumentation

Type	Manufacturer	Model	Serial Number	Last Cal	Cal Due
Calibrator	NTi	CAL200	19829	12/11/2024	12/11/2025
SLM	NTi	XL3-TA	A3A-1773-FO	09/07/2025	09/07/2027
Pre-amp	NTi	MA220	15205	09/07/2025	09/07/2027
Microphone	NTi	MC230A	A31329	09/07/2025	09/07/2027
SLM	NTi	XL3-TA	A3A-01774-FO	10/07/2025	10/07/2027
Pre-amp	NTi	MA220	15221	10/07/2025	10/07/2027
Microphone	NTi	MC230A	A31393	10/07/2025	10/07/2027

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Appendix C – Weather Conditions Chart Used

(Blank version)

Weather Conditions				
Measurement Location	**Date/Time**	**Description**	**Beginning of Survey**	**End of Survey**
		Temperature:		
		Precipitation:		
		Cloud cover (oktas - see guide)		
		Presence of fog/snow/ice		
		Presence of damp roads/wet ground		
		Wind Speed (m/s)		
		Wind Direction		
		Conditions that may cause temperature inversion (i.e. calm nights with no cloud)		

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Appendix D – CadnaA Calculation Sheet

Details available upon request due to the number of pages to the calculation sheet.