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TREVOR MENNELL PLANNING

NOISE IMPACT ASSESSMENT REPORT

LAND WEST OF THE BUNGALOW, HALTON, CHIRK LL14 5BG

Client: Trevor Mennell Planning

Report Ref: P7998-R1-V1

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REPORT VERSION CONTROL:

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1 INTRODUCTION

1.1 Overview

1.1.1 By instruction from Trevor Mennell Planning ('the client'), NoiseAir was commissioned to undertake a noise impact assessment (NIA) in support of a partly retrospective planning application (ref: P/2024/1296) for proposed residential development at the location: Land West of the Bungalow, Halton, Chirk LL14 5BG, herein referred to as the 'development site'.

1.1.2 General limitations of this report are outlined in **Appendix A**.

1.2 Site Description

1.2.1 At the time of writing, the development site is brown field land with existing static caravans and 3 no. outhouse buildings located within a wider rural area.

1.2.2 The development site is bound to the north by a small parcel of greenfield land beyond which is the A5, a single carriageway A-road trafficked by vehicles restricted to 60 miles per hour (mph). To the east, the development site is bound by a residential property beyond which is Chirk Bypass (A5/A483), a single carriageway A-road trafficked by vehicles restricted to 60 mph, which connects to the A5 via Halton Roundabout, located c.52 m to the north-east of the development site.

1.2.3 To the south, the development is bound by Old Black Park Road, a single carriageway road trafficked by vehicles restricted to 50 mph, beyond which is Wrexham County Borough Council Environmental Department and Chirk Airfield. To the west, the development is bound by a small parcel of greenfield land beyond which is Higher Barracks Lane, a single carriageway road trafficked by vehicles restricted to 50 mph.

1.2.4 **Figure 1** shows an aerial photograph of the development site with respect to the local area and its context.

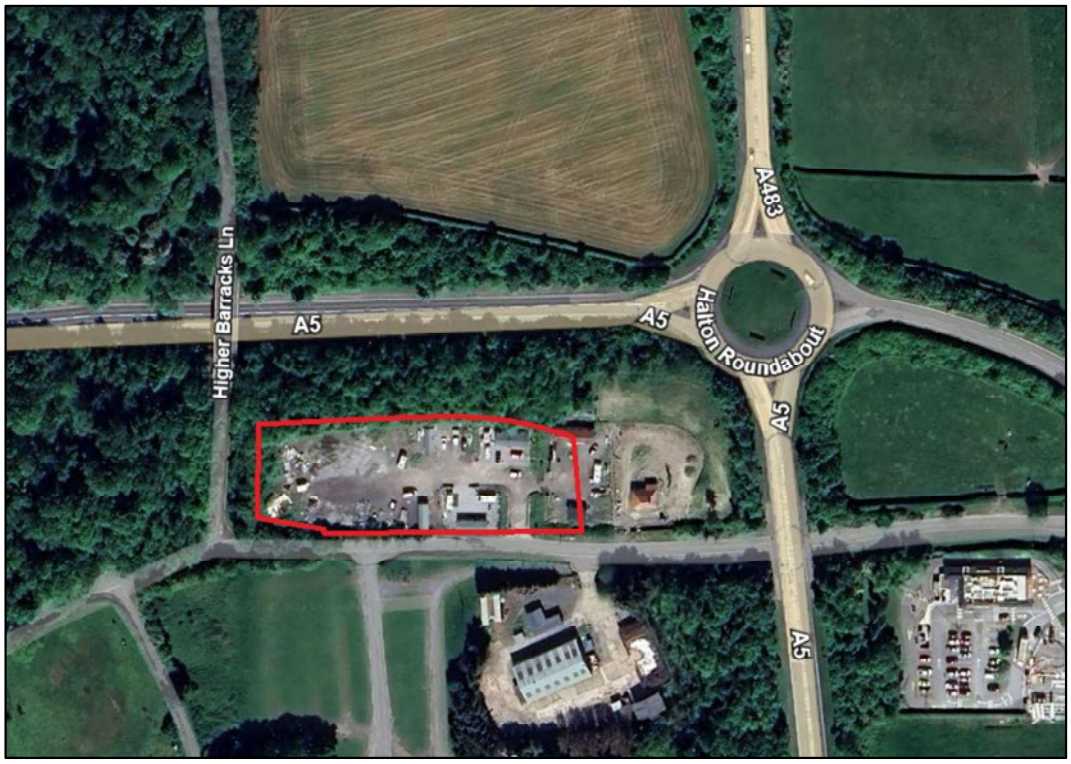


Figure 1: Development site aerial photograph

1.3 Development Proposals

1.3.1 Proposals for the development site outline the conversion of the site to provide 7 no. pitches for caravans with 6 no. twin unit chalets and construction of a communal amenity building. An existing static caravan is to be retained as part of Pitch 7.

1.3.2 This assessment is based on the proposed site layout as presented in **Figure 2** to **Figure 4**.

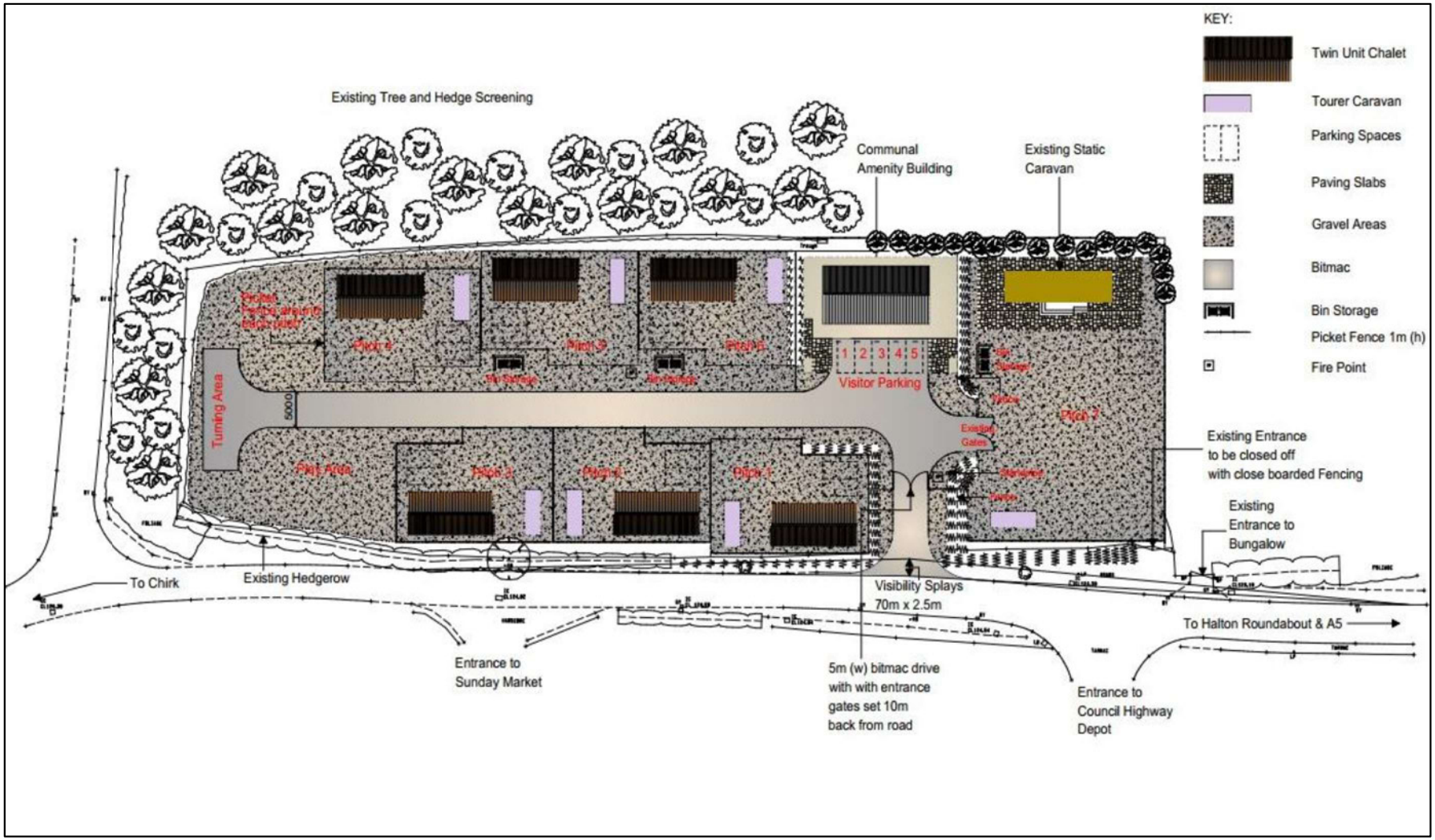


Figure 2: Proposed site layout.



Figure 3: Proposed site layout – Chalet floor plan and elevations.



Figure 4: Proposed site layout – Communal amenity block floor plan and elevations.

2 ASSESSMENT METHODOLOGY AND SCOPE OF WORKS

2.1 Planning Guidance and Noise

2.1.1 This acoustic report has been prepared in support of a proposed planning application and therefore it is considered that reference should be made to the appropriate planning guidance documentation, specifically:

- Planning Policy Wales – Edition 12 (PPW), February 2024; and,
- Planning Guidance (Wales) – Technical Advice Note 11 - Noise (TAN11), 1997.

2.1.2 A summary of the relevant planning documentation and its relevance with respect to noise is provided below.

2.2 Planning Policy Wales [PPW 2024]

2.2.1 Planning Policy Wales (PPW) sets out the land use planning policies of the Welsh Government. It is supplemented by a series of Technical Advice Notes (TANs), Welsh Government Circulars, and policy clarification letters, which together with PPW provide the national planning policy framework for Wales.

2.2.2 The primary objective of PPW is to ensure that the planning system contributes towards the delivery of sustainable development and improves the social, economic, environmental and cultural well-being of Wales, as required by the Planning (Wales) Act 2015, the Well-being of Future Generations (Wales) Act 2015 and other key legislation.

2.2.3 Section 6.7 of the PPW outlines planning policy with respect to Air Quality and Noise. PPW outlines that 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.

2.2.4 PPW also aligns with the agent of change principle which says that a business or person responsible for introducing a change is responsible for managing that change. In practice, for example, this means a developer would have to ensure that solutions to address air

quality or noise from nearby pre-existing infrastructure, businesses or venues can be found and implemented as part of ensuring development is acceptable.

2.2.5 In proposing new development, planning authorities and developers must, therefore:

- address any implication arising as a result of its association with, or location within, air quality management areas, noise action planning priority areas or areas where there are sensitive receptors
- not create areas of poor air quality or inappropriate soundscape; and
- seek to incorporate measures which reduce overall exposure to air and noise pollution and create appropriate soundscapes.

2.2.6 Furthermore, PPW states that the potential impacts of noise pollution arising from existing development (be this commercial, industrial, transport related or cultural venues i.e., music venues, theatres or arts centres), must be fully considered to ensure the effects on new development can be adequately controlled to safeguard amenity. Any necessary measures and controls should be incorporated as part of the proposed new development. This will help to prevent the risk of restrictions or possible closure of existing premises or adverse impacts on transport infrastructure due to noise and other complaints from occupiers of new developments. It will be important that the most appropriate level of information is provided, and assessment undertaken.

2.3 Consultation with Local Planning Authority

2.3.1 Planning application P/2024/1296 was validated by Wrexham County Borough Council on 5th August 2024. A response was received from Ian Jones, Public Protection Service Manager, on 1st October 2024.

2.3.2 Regarding noise, it states:

"RPT 2 - REPORT REQUIRED

I recommend the below noise survey be required prior to determination.

A noise survey shall be carried out, and a detailed report of the survey findings submitted to, and approved in writing by, the Local Planning Authority. The noise survey shall determine noise levels for both Day (07:00 – 23:00 hours) and Night (23:00 – 07:00 hours), having regard to Planning Policy Wales (PPW) Guidance, Technical Advice Note (TAN) 11 – Noise. The report of the noise survey findings shall include:

a) *Noise levels arising from day / night time activities in the vicinity of the proposed development site and the impact upon the proposed accommodation, and*

b) *A detailed scheme of noise insulation and / or attenuation measures so designed to safeguard the amenity of the occupants of the proposed accommodation."*

2.4 Scope of Works

2.4.1 The location of the development site is in close proximity to A5, Chirk Bypass (A5/A483), Old Black Park Road and Higher Barracks Lane which were identified as the dominant noise sources during the site visit. Therefore, it is considered that the NIA should consider noise primarily from road traffic noise sources.

2.4.2 The scope of this assessment includes consideration of noise at each facade of the development where noise sensitive areas might be located in terms of the potential impact of local noise sources.

2.5 Assessment Criteria

2.5.1 Given the dominant noise likely to impact the site is that from road traffic noise, it is considered that the noise assessment and subsequent criteria should be undertaken in accordance with BS 8233:2014. A summary of this guidance is provided below.

2.5.2 The internal noise criteria within BS 8233:2014 is typically used to assess long-term residential development, however, as there are no standards or guidance which specifically relate to internal noise levels for caravans, the BS 8233:2014 criteria has been selected as a conservative target.

2.6 British Standard 8233:2014 (BS 8233:2014)

2.6.1 British Standard 8233:2014 – Guidance on sound insulation and noise reduction for buildings (BS 8233:2014) provides guidance on internal ambient noise levels, resulting from break-in of external environmental noise that should not be exceeded in various locations within dwellings.

2.6.2 Guidelines for buildings in terms of internal noise level are reported in **Table 1**.

Table 1: Summary of Internal Noise Guidelines.			
Activity	**Location**	**0700 – 2300 hours**	**2300 – 0700 hours**
Resting	Living Room	35 dB $L_{Aeq,16hour}$	-
Dining	Dining room / area	40 dB $L_{Aeq,16hour}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,8hour}$

2.6.3 The standard clarifies that these values are based on the existing guidelines issued by the World Health Organisation (WHO). In addition, it states that the internal noise levels may be relaxed by up to 5 dB whilst maintaining a reasonable living condition. Conversely, in terms of internal maximum levels to be achieved during the night, the standard does not recommend any limits for individual noise events. However, a guideline value may be set in terms of SEL or L_{AFmax}, depending on the type and the number of events per night.

3 ACOUSTIC SURVEY

3.1 Acoustic Survey Details

3.1.1 NoiseAir conducted unattended noise monitoring between the 8th September 2025 and the 11th September 2025 at the development site.

3.1.2 Noise monitoring was undertaken at one monitoring location (ML1), the position of which is presented in **Figure 5** below.



Figure 5: Approximate noise monitoring location

3.1.3 The noise measurement was made using a Class 1, integrating sound level meter (SLM).

3.1.4 The acoustic equipment was calibrated to comply with Section 4.2 of BS7445-1:2003[1] before and after the noise monitoring periods.

3.1.5 Details of the SLM and associated field calibration can be found in **Table 2**.

Table 2: Summary of SLM Used for Survey and Associated Field Calibration

SLM (Serial No.)	Preamp (Serial No.)	Microphone (Serial No.)	Calibrator (Serial No.)	Start Calibration	End Calibration	Drift
NOR140 (1402868)	NOR1209 (12320)	NOR1225 (72835)	B&K 4231 (2482550)	-25.4 dB	-25.3 dB	0.1 dB

3.1.6 The weather conditions were noted to be as outlined in **Table 3** at the start and end of the monitoring period.

[1] BS7445-2003 "Description and measurement of environmental noise – Part 1: Guide to quantities and procedures.

Table 3: Summary of Weather Conditions Noted at the Start and End of Monitoring Duration		
	8th September 2025	11th September 2025
Roads (Wet / Dry)	Dry	Dry
Temperature (°C)	16	12
Wind speed (ms^{-1})	Up to 4.6 SW	Up to 4.7 SW
Cloud Cover (Approx. %)	20	40
Humidity (%)	66	85

3.2 Measured Sound Levels

3.2.1 Data is shown in **Figure 6**, overleaf, detailing a level vs. time graph of the recorded L_{Amax}, L_{Aeq} and L_{A90} sound level for ML1 over 15-minute time periods.

3.2.2 The results summary for the monitoring location during the daytime and night-time periods are presented in **Table 4** below.

Table 4: Average Measured Daytime and Night-time Noise Levels		
Monitoring Location	Time	Measured Noise Level
		dB $L_{Aeq,16hour}$ / dB $L_{Aeq,8hour}$ / dB $L_{AF(max)}$
ML1	07:00-23:00	56.2 – 58.4
	23:00-07:00	52.9 – 53.8
	23:00-07:00	68.9*
* Maximum night-time noise levels exceeded more than 10 times in a single night-time period.		

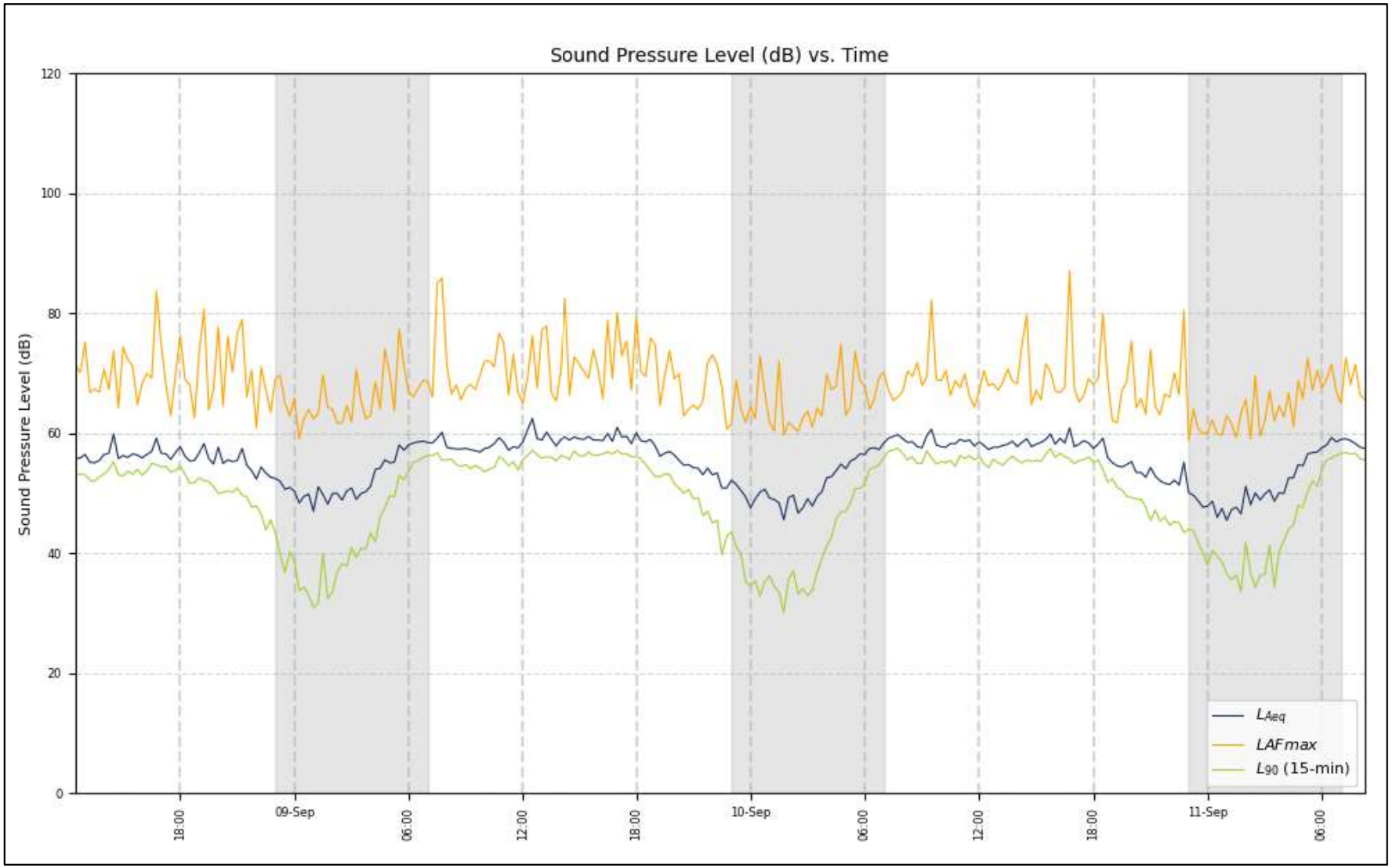


Figure 6: Level vs. time graph showing L_{Amax}, L_{Aeq} and L_{A90} sound levels – ML1

4 3D SOUND MODEL

4.1 Overview

4.1.1 A 3D sound model has been constructed in SoundPLAN™ to calculate the predicted sound pressure levels at selected potential external receiver locations from surrounding road traffic noise sources. The model uses the calculation method from ISO 9613-2:1996[2] to account for the distance between the source and receiver and any screening or reflections provided by surrounding buildings. The model is based on and calibrated against measured data.

4.2 3D Sound Model

4.2.1 The 3D sound model specifically includes noise emissions from A5, Chirk Bypass (A5/A483), Old Black Park Road and Higher Barracks Lane modelled as 4 no. line source sets to 0.5 m above local ground level and calibrated to ML1 measured data.

4.2.2 A noise contour plot illustrating the propagation of the sound from source to receptor during the daytime ($L_{Aeq,16hour}$) condition is given in **Figure 7**.

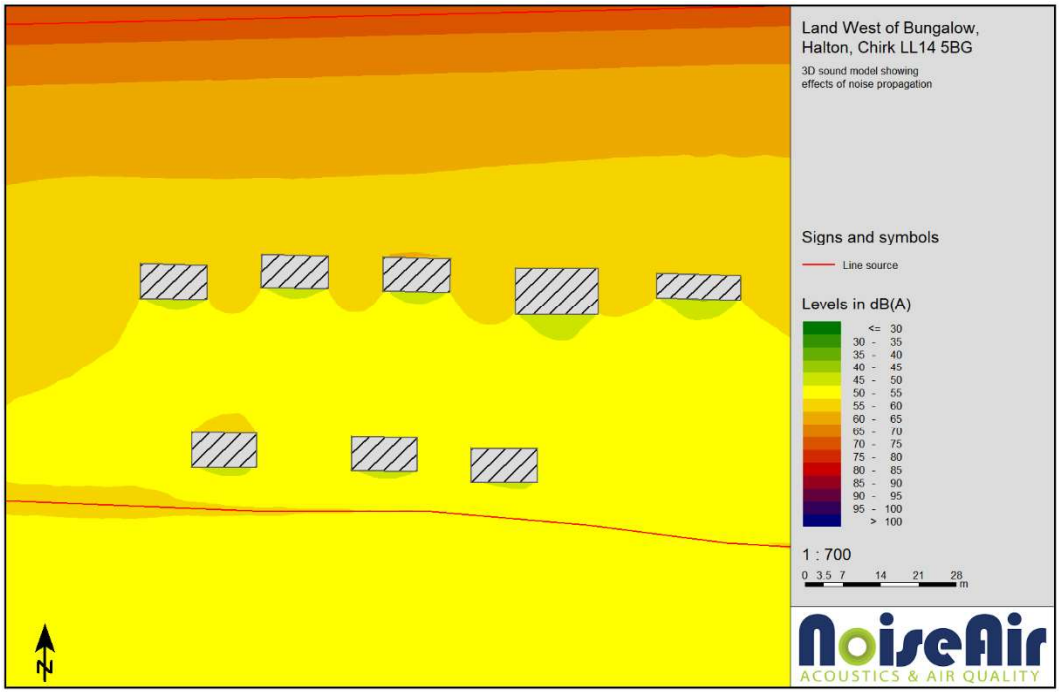


Figure 7: Noise propagation of sound during the daytime – $L_{Aeq,16hour}$.

4.2.3 Receptor locations used in the noise model with calculated external levels are presented in **Figure 8**.

[2] ISO9613-2:1996 "Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation"

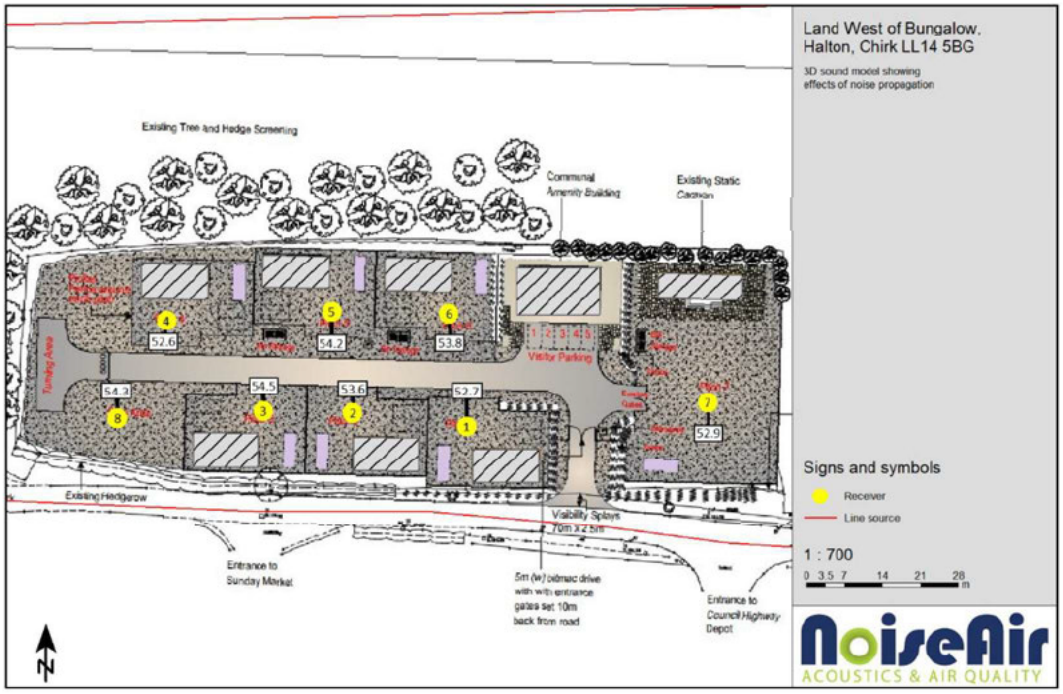


Figure 8: Illustration of the 3D sound model receptor locations.

4.2.4 **Table 5** below details the predicted noise levels at the external amenity locations.

Table 5: Predicted External Amenity Noise Levels

Location	Receptor Number	dB $L_{Aeq,T}$
Pitch 1	1	52.7
Pitch 2	2	53.6
Pitch 3	3	54.5
Pitch 4	4	52.6
Pitch 5	5	54.2
Pitch 6	6	53.8
Pitch 7	7	52.9
Play Area	8	54.3

5 NOISE IMPACT ASSESSMENT

5.1 Overview

5.1.1 The development site is in close proximity to road traffic noise sources. Therefore, the predicted internal noise levels of the development have been assessed against the criteria stated in BS 8233:2014.

5.2 BS 8233:2014 Assessment of Daytime Noise Levels in Outdoor Living Areas

5.2.1 At the time of writing, plans indicate that each pitch has an external amenity area and a play area is also proposed at the development site.

5.2.2 Analyses of the calculated noise levels, indicate that the $L_{Aeq,16hour}$ ranges from 52.6 dB(A) to 54.5 dB(A), which exceeds the recommended 50 dB $L_{Aeq,T}$ BS 8233:2014 guideline for external amenity but is does not exceed the BS 8233:2014 upper guideline of 55 dB $L_{Aeq,T}$.

5.3 Assessment of Daytime Noise Levels in Living Rooms and Bedrooms

5.3.1 The predicted noise levels at the façades of the proposed structures, for the daytime and night-time period, together with the level of attenuation required in accordance with BS 8233:2014, are presented in **Table 6**.

Table 6: Level of Attenuation Required to Achieve the Internal Noise Guideline Levels.

Façade	Daytime ($L_{Aeq,16hours}$) / Night-Time ($L_{Aeq,8hours}$ / L_{Amax})	Worst Case Noise Level at the Façade of the Property (dB(A))	BS 8233:2014 Target Internal Level (dB(A))	Worst Case Level of Attenuation Required (dB(A))
All	Daytime $L_{Aeq,16hours}$	58	35	23
	Night-Time $L_{Aeq,8hours}$	54	30	24
	Night-Time L_{Amax}	69	45	24

5.4 Building Envelope Performance – Windows Open

5.4.1 With windows open, the attenuation provided by the façade will be approximately 10-15 dB(A).

5.4.2 Given the incident noise levels, the noise level break-in at the development site facades would likely result in the recommended internal noise limit being exceeded in some of rooms at the development during certain parts of a typical day/ night, predominantly facades facing to the north. This is typical of most development near transport noise sources. It is therefore considered that acceptable noise levels within habitable rooms will rely on windows being in the closed position for all facades bar southern facades.

5.4.3 Windows located on the screened facades of the chalet and caravans are likely to have a noise level up to 10 dB lower than that measured at ML1. It is likely that acceptable internal levels can be achieved with partially open windows at southern facades.

5.4.4 Given this, ventilation that does not rely on partially open windows will be required across the majority of facades of the development site. Caravans are typically constructed to include some form of passive ventilation. The proposal should therefore implement an in-built passive system for alternative ventilation.

5.4.5 It must be noted that any ventilation requirements are to be designed by others.

6 SOUND INSULATION SCHEME

6.1 Building Envelope Requirements

6.1.1 Proposals for the development site, at the time of writing, outline the erection of 6 no. chalets and the construction of pitches for 7 no. caravans, as presented in **Figure 2**.

6.1.2 It is understood that noise sensitive rooms may be proposed to any façade. In line with BS 8233:2014, internal noise levels should not exceed 35 dB $L_{Aeq,16hours}$ during the daytime hours in all rooms and 30 dB L_{Aeq} during the night-time hours in bedrooms. Additionally, in bedrooms during the night-time, the L_{AFmax} noise levels should not typically exceed 45 dB(A).

6.1.3 The worst-case façade attenuation requirement of 24 dB(A) (taken from **Table 6**) has been adopted in order to calculate the attenuation required for each element of the façade.

6.1.4 BS 3632:2015 for static caravans, residential park homes and leisure homes, specifies the following:

> *"The external walls shall have an average sound reduction index of not less than 35 dB over a frequency range of 125 Hz to 4000 Hz excluding door, window and ventilation apertures".*

6.1.5 The difference between the noise level incident on the external facades and noise level incident on the roof is likely to be negligible, therefore it is recommended that a minimum sound reduction of 35 dB R_w is also applicable to the roof construction for the lodge.

6.1.6 Calculations indicate that, with a building envelope construction selected to achieve the sound reduction index (SRI) values presented in **Table 7,** reasonable internal L_{Aeq} noise levels can be achieved in noise sensitive rooms during the daytime and night-time.

Table 7: Required sound insulation per octave band for the lodge building envelope

Building Element	Sound Insulation Spectrum (dB)						$R_w + C_{tr}$
	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	
Caravan building envelope	35	35	35	35	35	35	32

6.1.7 It should be noted that the specification of the building envelope in **Table 7** is presented as an R_w+C_{tr} value, the equivalent R_w value is 36 dB which achieves the criteria of 35 dB R_w specified in BS 3632:2015.

6.1.8 Typically, a caravan includes some kind of passive ventilation and therefore NoiseAir would expect passive ventilation that achieves the values stated in **Table 7**.

7 CONCLUSIONS

7.1 Overview

7.1.1 By instruction from Trevor Mennell Planning, NoiseAir was commissioned to undertake a NIA in support of a partly retrospective planning application (ref: P/2024/1296) for proposed residential development at the location: Land West of the Bungalow, Halton, Chirk LL14 5BG.

7.1.2 Proposals for the development site outline the conversion of the site to provide 7 no. pitches for caravans with 6 no. twin unit chalets and construction of a communal amenity building. An existing static caravan is to be retained as part of Pitch 7.

7.2 Conclusions

7.2.1 Calculations indicate that, with a building envelope construction selected to achieve the sound reduction index (SRI) values presented in **Table 7,** reasonable internal L_{Aeq} noise levels can be achieved in noise sensitive rooms during the daytime and night-time.

7.2.2 With windows open, the recommended internal noise guideline threshold is likely to be exceeded within the development and an in-built passive system should be implemented for alternative ventilation. Windows are likely to be openable to the southern facades and achieve acceptable internal noise levels.

APPENDIX A - REPORT LIMITATIONS

This Report is presented to Trevor Mennell Planning and may not be used or relied on by any other person or by the client in relation to any other matters not covered specifically by the scope of this report.

Notwithstanding anything to the contrary contained in the report, NoiseAir Limited is obliged to exercise reasonable skill, care and diligence in the performance of the services required by Trevor Mennell Planning and NoiseAir shall not be liable except to the extent that it has failed to exercise reasonable skill, care and diligence, and this report shall be read and construed accordingly.

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Where assessments of works or costs identified in this report are made, such assessments are based upon the information available at the time and where appropriate are subject to further investigations or information which may become available.

Where / if estimates and projects are made within this report, are made based on reasonable assumptions as of the date of this report, such statements however by their very nature involve risks and uncertainties that could cause actual results to differ materially from the results predicted. NoiseAir Limited specifically does not guarantee or warrant any estimates or projects contained in this report.

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APPENDIX B - GLOSSARY

A-weighted sound pressure, p_A	Value of overall sound pressure, measured in pascals (Pa), after the electrical signal derived from a microphone has been passed through an A-weighting network. *NOTE: The A-weighting network modifies the electrical response of a sound level meter with frequency in approximately the same way as the sensitivity of the human hearing system.*
A-weighted sound pressure level, L_{pA}	Quantity of A-weighted sound pressure in decibels (dBA).
Acoustic environment	Sound from all sound sources as modified by the environment [BS ISO 12913-1:2013].
Ambient sound	Totally encompassing sound in a given situation at a given time, usually composed of sound from many sources near and far. *NOTE: The ambient sound comprises the residual sound and the specific sound when present.*
Ambient sound level, $L_a = L_{Aeq,T}$ (BS4142:2014)	Equivalent continuous A-weighted sound pressure level of the totally encompassing sound in a given situation at a given time, usually from many sources near and far, at the assessment location over a given time interval, T *NOTE: The ambient sound level is a measure of the residual sound and the specific sound when present.*
Background sound	Underlying level of sound over a period, *T*, which might in part be an indication of relative quietness at a given location.
Background sound level, $L_{A90,T}$ (BS4142:2014)	A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, T, measured using time weighting F and quoted to the nearest whole number of decibels.
Break-in	Noise transmission into a structure from outside.
Break-out	Noise transmission from inside a structure to the outside.
Cross-talk	Noise transmission between one room and another room or space via a duct or other path.
C_{tr}	Correction term applied against the sound insulation single-number values (R_w, D_w, and $D_{nT,w}$) to provide a weighting against low frequency performance. *NOTE: The reference values used within the C_{tr} calculation are based on urban traffic noise.*
Equivalent continuous A-weighted sound pressure level, $L_{Aeq,T}$	Value of the A-weighted sound pressure level in decibels (dB) of a continuous, steady sound that, within a specified time interval, T, has the same mean-squared sound pressure as the sound under consideration that varies with time.
Equivalent continuous A-weighted sound pressure level, $L_{Aeq,T}$ (BS4142:2014)	Value of the A-weighted sound pressure level in decibels of continuous steady sound that, within a specified time interval, $T = t_2 - t_1$, has the same mean-squared sound pressure as a sound that varies with time.
Equivalent sound absorption area of a room, A	Hypothetical area of a totally absorbing surface without diffraction effects, expressed in square metres (m2), which, if it were the only absorbing element in the room, would give the same reverberation time as the room under consideration
Facade level	Sound pressure level 1 m in front of the façade. *NOTE: Facade level measurements of L_{pA} are typically 1 dB to 2 dB higher than corresponding free-field measurements because of the reflection from the facade.*
Free-field level	Sound pressure level away from reflecting surfaces. *NOTE: Measurements made 1.2 m to 1.5 m above the ground and at least 3.5 m away from other reflecting surfaces are usually regarded as free-field. To minimize the effect of reflections the measuring position has to be at least 3.5 m to the side of the reflecting surface (i.e. not 3.5 m from the reflecting surface in the direction of the source). Estimates of noise from aircraft overhead usually include a correction of 2 dB to allow for reflections from the ground.*

Impact sound pressure level, L_i	Average sound pressure level in a specific frequency band in a room below a floor when it is excited by a standard tapping machine or equivalent.
Indoor ambient noise	Noise in a given situation at a given time, usually composed of noise from many sources, inside and outside the building, but excluding noise from activities of the occupants. *NOTE: The location(s) within the room at which the ambient indoor noise is to be measured or calculated ought to be considered.*
Measurement time interval, T_m (BS4142:2014)	Total time over which measurements are taken. *NOTE: This may consist of the sum of a number of non-contiguous, short-term measurement time intervals.*
Noise criteria	Numerical indices used to define design goals in a given space.
Noise rating, NR	Graphical method for rating a noise by comparing the noise spectrum with a family of noise rating curves.
Normalised impact sound pressure level, L_n	Impact sound pressure level normalized for a standard absorption area in the receiving room. *NOTE: Normalised impact sound pressure level is usually used to characterize the insulation of a floor in a laboratory against impact sound in a stated frequency band.*
Octave band	Band of frequencies in which the upper limit of the band is twice the frequency of the lower limit.
Percentile level, $L_{AN,T}$	A-weighted sound pressure level obtained using time-weighting "F", which is exceeded for *N*% of a specified time interval.
Reference time interval, T_r (BS4142:2014)	Specified interval over which the specific sound level is determined. *NOTE: This is 1 h during the day from 07:00 h to 23:00 h and a shorter period of 15 min at night from 23:00 h to 07:00 h.*
Residual sound (BS4142:2014)	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.
Residual sound level, $L_r = L_{Aeq,T}$ (BS4142:2014)	Equivalent continuous A-weighted sound pressure level of the residual sound at the assessment location over a given time interval, T.
Rating level, $L_{Ar,Tr}$	Equivalent continuous A-weighted sound pressure level of the noise, plus any adjustment for the characteristic features of the noise. *NOTE: This is used in BS 7445 and BS 4142 for rating industrial noise, where the noise is the specific noise from the source under investigation.*
Reverberation time, *T*	Time that would be required for the sound pressure level to decrease by 60 dB after the sound source has stopped.
Sound exposure level, *LAE*	Level of a sound, of 1 s duration, that has the same sound energy as the actual noise event considered.
Sound level difference, *D*	Difference between the sound pressure level in the source room and the sound pressure level in the receiving room.
Sound pressure, *p*	Root-mean-square value of the variation in air pressure, measured in pascals (Pa) above and below atmospheric pressure, caused by the sound.
Sound pressure level, L_p	Quantity of sound pressure, in decibels (dB).

Sound reduction index, *R*	Laboratory measure of the sound insulating properties of a material or building element in a stated frequency band.
Specific sound level, $L_s = L_{Aeq,Tr}$ (BS4142:2014)	Equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, T_r.
Specific sound source (BS4142:2014)	Sound source being assessed.
Standardised impact sound pressure level, L'_{nT}	Impact sound pressure level normalized to a reverberation time in the receiving room of 0.5 s.
Standardised level difference, D_{nT}	Difference in sound level between a pair of rooms, in a stated frequency band, normalized to a reference reverberation time of 0.5 s for dwellings.
Groundborne noise	Audible noise caused by the vibration of elements of a structure, for which the vibration propagation path from the source is partially or wholly through the ground. *NOTE Common sources of ground-borne noise include railways and heavy construction work on adjacent construction sites.*
Structure-borne noise	Audible noise caused by the vibration of elements of a structure, the source of which is within a building or structure with common elements. *NOTE Common sources of structure-borne noise include building services plant, manufacturing machinery and construction or demolition of the structure.*
Third octave band	Band of frequencies in which the upper limit of the band is 2% times the frequency of the lower limit.
Weighted level difference, D_w	Single-number quantity that characterizes airborne sound insulation between rooms, but which is not adjusted to reference conditions. *NOTE Weighted level difference is used to characterize the insulation between rooms in a building as they are. Values cannot normally be compared with measurements made under other conditions (see BS EN ISO 717-1).*
Weighted normalised impact sound pressure level, $L'_{n,w}$	Single-number quantity used to characterize the impact sound insulation of floors over a range of frequencies.
Weighted sound reduction index, R_w	Single-number quantity which characterizes the airborne sound insulating properties of a material or
Weighted standardised impact sound pressure level $L'_{nT,w}$	Single-number quantity used to characterize the impact sound insulation of floors over a range of frequencies.
Weighted standardised level difference, $D_{nT,w}$	Single-number quantity that characterizes the airborne sound insulation between rooms.

Symbols

D_w	Weighted level difference (dB)
D_{nT}	Standardized level difference (dB)
$D_{nT,w}$	Weighted standardized level difference (dB)
L_{Amax}	Maximum noise level (dB)
$L_{Ar,Tr}$	Rating level (dB)
L_n	Normalised impact sound pressure level (dB)
L'_{nT}	Standardised impact sound pressure level (dB)
$L'_{nT,w}$	Weighted standardised impact sound pressure level (dB)
$L'_{n,w}$	Weighted normalised impact sound pressure level (dB)
L_p	Sound pressure level (dB)
L_{pA}	A-weighted sound pressure level (dB)
$L_{AN,T}$	Percentile level (dB)
L_{AE}	Sound exposure level (dB)
$LAeq,T$	Equivalent continuous A-weighted sound pressure level (dB)
p	Sound pressure (Pa)
p_A	A-weighted sound pressure (dB)
$p_{A(t)}$	Instantaneous A-weighted sound pressure (Pa)

R	Sound reduction index (dB)
R_w	Weighted sound reduction index (dB)
T	Time interval (also used for reverberation time) (s)
t_0	Reference time interval (s)

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