



Noise Assessment: Mitcheldean, Carisbrooke Road

February 2025



Experts in noise and vibration
assessment and management

Document Control

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Job Number	15682A-20
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Document Status and Review Schedule

Report No.	Date	Status	Reviewed by
15682A-20-R01-06	19 February 2025	Final	David Sproston (Associate Director)

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Executive Summary

This report determines the potential impact of noise upon an outline proposed residential development (the 'Development') for Land at Carisbrooke Road, Mitcheldean, (the 'Site') that falls within the administrative boundary of Forest of Dean District Council (FDDC).

A planning application for residential development at the Site was previously submitted to FDDC in March 2019 and was refused on grounds other than noise. Consequently, the principal of noise-sensitive development on the Site has therefore already been established.

This report describes the existing acoustic environment across the Site and evaluates potential impacts upon the proposed Development from existing sources of environmental noise. Road traffic noise was found to be the main source of noise across Site.

An initial site risk assessment has been undertaken based on the results of a baseline survey in accordance with ProPG, which demonstrates that the Site is at a likely 'Low' – 'Medium' risk of adverse effects in the day and night-time on an open site basis and in the absence of specific mitigation measures.

With windows open, predicted levels in some dwellings closest to Bradley Court Road towards the eastern Site boundary are expected to exceed the adopted noise criteria, although this is commonly the case for many developments except for those located in remote rural locations. With windows closed, it has been demonstrated that the adopted internal noise criteria on land closest to the western Site boundary can be met with an appropriate scheme of glazing and ventilation, if necessary.

Land closest to the B4224 to the west is considered a 'Low Risk' and developable areas fronting Bradley Court Road are considered a 'Low' to 'Medium Risk' with respect to ProPG. Therefore, whilst dwellings will be set further back from these roads and noise levels will be lower than have been measured, ventilation requirements will need to be considered during the detailed design at the reserved matters stage.

The assessment demonstrates that good acoustic design is capable of overcoming any acoustic challenges of the Site and it is considered unlikely to give rise to a significant adverse impact on health and quality of life in relation to noise in accordance with paragraphs 187 and 198 of the NPPF nor be in conflict with Para 200 (agent of change) of the NPPF.

In conclusion, the Site is considered suitable for noise-sensitive residential development, provided that a commensurate level of protection against noise is incorporated into the design of the development to secure an acceptable degree of amenity for future residents. The requirement to incorporate noise mitigation measures into the design and use of the Site can be secured by a carefully worded planning condition, if necessary.

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1 Introduction

- 1.1 Noise Consultants Ltd (NCL) has been commissioned by Gladman Developments Ltd (Gladman) to undertake a noise assessment in connection with an outline proposed residential development (the 'Development') on Land off Carisbrook Road, Mitcheldean (the 'Site'). The Site falls within the administrative boundary of the Forest of Dean District Council (FDDC).
- 1.2 NCL produced a noise assessment (Report ref: J1052, dated 1st December 2018) in support of a previous residential planning application for the Site. In March 2019 the application to FDDC (Ref: P1994/18/OUT) and was refused on grounds other than noise. Therefore, the principal of noise-sensitive development on the Site has already been established.

Existing Site and Environs

- 1.3 The Site location, application boundary and wider area are shown in **Figure 1.1**.
- 1.4 The Site is located approximately north of the village of Mitcheldean and is bounded to the north by agricultural land, to the east by Bradley Court Road and to the west and southwest by the B4224. To the east/southeast of the Site, are industrial premises at Vantage Point Business Village and 'Electronic Data System' premises (now **DWC Technologies**). Vantage Point Business Village comprises several Class B2/B8 uses including The Range (Distribution Centre) and BRG Technologies Manufacturing Centre.
- 1.5 The main sources of environmental noise impacting the proposed Development have been identified as road traffic noise from the B4224 to the west and southwest and Bradley Court Road to the east. Industrial/commercial noise from the facilities to the southeast are unlikely to be a dominant contributor to the acoustic environment within the Site.

Proposed Development Details

- 1.6 The outline proposed Development comprises the construction of up to 180 dwellings in an area of approx. **9.7** hectares (ha), a Local Equipped Area for Play (LEAP) to the southwest, along with associated green infrastructure. Vehicular access to the Site will be provided via Ross Road.
- 1.7 The proposed developable area is shown in **Figure 1.1**.

Commented [SN2]: Still operational? Gate blocked since 2018

Commented [DS3R2]: Add a comment if this is the case.

Commented [DS4]: Can we add more information on what these premises do? Anything of relevance/

Commented [DS5]: Do we add a high level comment on the absence of noise from the Data and business Villages

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Developable area 4.85 ha

Figure 1.1: Site Location, Environs and Proposed Developable Area



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Assessment Scope

1.8 The purpose of this noise assessment is to support an outline planning application to FDDC, and has been prepared in accordance with National legislation, policies, and guidance and by reference to appropriate British and International standards which are summarised in **Appendix A1**. This report presents the findings of a baseline noise survey and an assessment of noise impacts on the suitability of the Site for residential development. The assessment has considered local ambient noise sources including road traffic and has included:

- Long-term noise surveys within the site to establish existing road traffic noise levels on land closest to the B4224 and Bradley Court Road and any contribution to the noise climate from industrial land uses to the east/southeast;
- Calculations to establish likely day and night-time noise exposure at the Site;
- Analysis and assessment of the measured noise levels with respect to appropriate standards and guidance; and,
- Provision of an outline scheme of noise mitigation measures capable of securing suitable amenity for future residents of the development.

Local Authority Consultation

- 1.9 NCL contacted the environmental health practitioner for FDDC in advance of undertaking any noise assessments in connection with the previous assessment in 2019, and before preparing this noise assessment. It was agreed that an updated noise assessment can be submitted with the outline application as surrounding land uses have not seen any significant changes in planning terms since the previous application in 2019. It was also agreed that baseline noise levels obtained at the Site can be used in this assessment, and the same assessment methodology was acceptable.

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Notes

- 1.10 Noise levels in the body of this report have been rounded to the nearest whole number since fractions of decibels (dB) are imperceptible. Noise data is reported in terms of an A-weighting (denoted by a subscript 'A') and approximates the frequency response of the human ear.
- 1.11 A glossary of acoustic terminology used in this report is provided in **Section 7**.
- 1.12 The recommendations presented within this report are based on acoustic considerations only and the assumptions stated.

2 Assessment Approach

Baseline Noise Survey

- 2.1 To quantify current levels of noise affecting the proposed Development, a part-attended baseline noise survey was conducted between 12:00hrs on Tuesday 16th October 2018 and 12:00hrs on Wednesday 17th October 2018. **Figure 2.1** presents the noise monitoring locations, which are described in **Table 2.1**. Full details of the baseline survey are provided in **Appendix A2**.
- 2.2 Noise monitoring was supplemented by observations of the acoustic environment. The sound level meters (SLMs) were configured to capture continuous audio so that it could be reviewed to identify any significant noise events where necessary and assist in the assessment.

Local Conditions

- 2.3 Average wind speeds during the survey were no more than 5 ms⁻¹ and no precipitation was observed. There were no local roadworks or other known traffic control measures in place during the survey. The local conditions were therefore judged to be acceptable for the survey and subsequent assessment.

Figure 2.1: Baseline Survey Measurement Locations



Table 2.1: Summary of Survey Locations

Location	Description	Purpose	Date and Time
ML1	Deployed close to the western site boundary. Unattended measurement. Free-field conditions	To measure road traffic noise from the B4224 to the western boundary.	16/10/2018 12:00 – 17/10/2018 12:00
ML2	Deployed on the eastern site boundary. Attended and unattended measurements. Free-field conditions.	To measure distant road traffic noise from Bradley Court Road and any potential operational noise from Electronic Data System.	16/10/2018 12:53 – 13:08 13:36 – 13:51 14:15 – 14:40 15:10 – 15:25 15:50 – 16:05 17:00 – 23:00 16/10/2018 23:00 – 17/10/2018 07:00 17/10/2018 07:00 – 09:00
ML3	Deployed near to the southeast site boundary. Unattended measurement. Free-field conditions.	To measure road traffic noise from the B4224.	16/10/2018 12:30 – 17/10/2018 12:30
ML4	Deployed close to the eastern site boundary. Attended measurements. Free-field conditions.	To measure road traffic noise from Bradley Court Road and any operational noise from Vantage Point Business Village.	16/10/2018 13:15 – 13:30 13:55 – 14:10 14:37 – 14:52 15:31 – 15:46 16:09 – 16:24 17/10/2018 09:16 – 09:31 09:33 – 12:18

Commented [DS9]: Jesus this looks horrendous, but is needed!
Can add text to say how CLOSE to the roads these MLs are?? The daytime RT levels are up there but perhaps it is because of the proximity to the roads??

Commented [SN10R9]: Can't tell from previous report how close each ML is to the road

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Assessment Criteria

- 2.4 Assessment criteria have been selected in accordance with the national legislation, policies, and guidance and by reference to appropriate British and International standards outlined in **Appendix A1**.
- 2.5 As road traffic is the only potentially significant noise sources affecting noise sensitive development at the Site, the following assessment methodology has been adopted.

Transportation Noise

- 2.6 Assessment criteria adopted for road traffic noise have been designed to follow the approach advocated in ProPG¹. The guidance has been produced to assist practitioners in matters relating to noise and new residential development. It focuses on existing transportation noise sources and has

¹ ProPG Planning & Noise – Professional Practice Guidance on Planning & Noise, 2017 (ProPG)

been developed to consider the Government's overarching noise policy, planning policy and policy guidance. It has also been developed to take into account other authoritative sources of guidance such as British Standard 8233:2014 'Guidance on Sound Insulation and Noise Reduction for Buildings' (BS 8233:2014).

Selection of LOAEL and SOAEL

- 2.7 Planning Practice Guidance for Noise (PPG-N) draws on the principles of the Noise Policy Statement for England (NPSE), in particular the concepts of 'No Observed Effect Level' (NOEL), 'Lowest Observed Adverse Effect Level' (LOAEL) and 'Significant Observed Adverse Effect Level' (SOAEL).
- 2.8 The NOEL is the level below which there is no detectable effect on health and quality of life due to noise. The LOAEL is the level above which adverse effects on health and quality of life can be detected. The SOAEL is the level above which significant adverse effects on health and quality of life occur.
- 2.9 For the purposes of undertaking the initial site noise risk assessment in accordance with ProPG Stage 1, the selections of LOAELs align with the onset of adverse effects as outlined in **Appendix A1**). The LOAEL and SOAEL for road noise as applied to this assessment **Table A.1.1**.
- 2.10 Where noise exposure is below LOAEL during both day and night-time periods, the noise risk is considered to be 'negligible'.

Internal Noise Amenity

- 2.11 For the purpose of considering internal noise levels, the assessment will be undertaken with reference to the internal noise guidelines set out in BS 8233:2014 as advocated by ProPG (**Appendix A1**). Adherence to these guidelines will be considered in the design of the building envelope.
- 2.12 In addition to the noise level guidelines provided by BS 8233:2014, the assessment will also consider maximum noise levels ($L_{Amax,F}$) within bedrooms at night. Where internal noise levels in bedrooms are likely to exceed 45 dB $L_{Amax,F}$ more than 10 times per night, as advocated by WHO GCN² (**Appendix A1**), this will be accounted for in the design of the building envelope.
- 2.13 With respect to the L_{AFmax} (night), ProPG states that;
- "the initial site noise risk assessment should include the consideration of the individual noise events when the external $L_{Amax,F}$ exceeds 60 dB. A site should not be regarded as a negligible risk if the $L_{Amax,F}$ exceeds, or is likely to exceed 60 dB more than 10 times a night. A site should be regarded as high risk if the $L_{Amax,F}$ exceeds, or is likely to exceed 80 dB more than 20 times a night."*

² World Health Organization Guidelines for Community Noise, 1999 (WHO GCN)

- 2.14 Therefore, taking this into account and with reference to the LOAEL and SOAEL thresholds for the L_{Amax} , for the purposes of this assessment, risk due to L_{Amax} levels has been assessed as presented **Table 2.2**.

Table 2.2: Site Noise Risk – $L_{Amax,F}$

Room / Location	Night-time L_{Amax} Exposure
Negligible	10 th highest measured $L_{Amax,F}$ is less than 60 dB
Low	10 th highest measured $L_{Amax,F}$ is between 60 dB and 80 dB
Medium	10 th highest measured $L_{Amax,F}$ is greater than 80 dB and the 20 th highest measured L_{Amax} is below 80 dB
High	20 th highest measured $L_{Amax,F}$ is greater than 80 dB

- 2.15 Internal noise levels with windows closed is influenced the building's façade construction and the associated elements of a room (including the sound insulation performance of glazing and ventilation). At this stage detailed design information of the proposed dwellings is not available. For the purposes of this assessment the following conservative assumptions have therefore been adopted for the 'closed window' scenario:

- Internal spaces have the following dimensions:
 - Living rooms – 4.0m x 3.0m
 - Bedrooms – 3.0m x 3.0m
 - Ceiling Heights – 2.4m (all rooms)
- The wall and room constructions of the dwellings are of a standard nature, i.e. brick and block wall construction as per the standard assumptions made within BS 8233:2014 with a sound reduction index (SRI) summarised in **Table 2.3**.
- The glazed areas of bedrooms and living rooms is equal to 40% of the area of the largest façade, higher than the 25% described in the Standard Assessment Procedure for Energy Rating of Dwellings' (SAP), 2012.
- Standard thermal double glazing and over/in-frame trickle ventilators will be incorporated into the dwellings that achieve a sound reduction index (SRI) summarised in **Table 2.3**.
- Standard roof (i.e. tiled), mineral wool insulation above plasterboard ceiling, per the standard assumptions made within BS 8233:2014.
- It is assumed that there will be a single trickle ventilator per room.

Table 2.3: Assumed Building Envelope SRI (dB)

Element	Sound Reduction Index (SRI) at Octave Centre Band Frequency (Hz)								R _w (C; C _{tr})
	63	125	250	500	1k	2k	4k	8k	
Double Glazing (6:12:4)	20	23	22	27	38	40	41	44	31 (-2; -4)
Brick and Block External Wall	40	40	44	45	51	56	56	56	51 (-2; -4)
Standard tiled roof & plasterboard ceiling with thermal quilt above	22	28	34	40	45	49	49	52	44 (-5)
Element	63	125	250	500	1k	2k	4k	8k	D _{ne,w} (C; C _{tr})
Standard In/over-frame Trickle Vent	20	23	26	29	30	33	33	35	31 (0; -2)

Commented [DS12]: Can you check this for me

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- 2.16 For the purpose of this assessment, a reduction of -13dB has been assumed for a partially open window.
- 2.17 For the purposes of this report, any description of 'uprated glazing and ventilation' and/or specific sound insulation for glazing and ventilation components refers to elements where the average weighted sound reduction index R_w and/or the Sound Reduction Index spectra is better than those presented in **Table 2.3**. The broadband sound insulation values are provided as a guide only.

External Noise Amenity

- 2.18 External noise amenity will be considered with reference to the guidance provided within BS 8233:2014 and WHO GCN. (**Appendix A1**). As the proposed development is likely to include 'traditional external areas' such as private gardens, the assessment will consider adherence with external noise levels below 55 dB L_{Aeq, 16hr} as an upper guideline value, with the number of gardens affected by an exceedance of this threshold minimised by design, where necessary.

Adopted Noise Design Criteria

- 2.19 The adopted noise assessment criteria are summarised in **Table 2.4**.

Table 2.4: Adopted Transport Noise Design Criteria from WHO GCN and BS 8233:2014

Room / Location	Daytime (07:00-23:00hrs)	Night-time (23:00-07:00hrs)
Living Room	≤35 dB L _{Aeq, 16hr}	-
Bedroom		≤30 dB L _{Aeq, 8hr} and not regularly exceeding 45 dB L _A F _{max}
Dining Room	≤40 dB L _{Aeq, 16hr}	-
Rear Gardens	≤55 dB L _{Aeq, 16hr} with any exceedance minimised by design	-

3 Noise Survey

Survey Observations

- 3.1 Observations of the acoustic climate at the survey locations are summarised in **Table 3.1**.

Table 3.1: Summary of Survey Observations

Noise Measurement Location	Observations
ML1	Road traffic noise on the B4224 was the dominant contributor to noise levels. Aircraft events were audible, including occasional aircraft overflight. Wind rustling vegetation audible. Birdsong audible. Occasional noise from livestock (cows, sheep). No audible noise from Vantage Point Business Village at any time. During the night-time period road traffic from the B4224 was the dominant contributor to noise levels.
ML2	Road traffic on Bradley Court Road to the east of the monitoring location was the dominant contributor to noise levels. Distant road traffic noise from the B4224 to the west of the monitoring location was also audible. Occasional aircraft flyover. Birdsong and wind rustling vegetation audible. No audible noise from Vantage Point Business Village at any time. During the night-time period a faint and distant 'hum', likely to be from plant at the Electronic Data System site, was audible, however road traffic noise from Bradley Court Road was considered to be the dominant contributor to noise levels.
ML3	Road traffic on the B4224 to the west of the monitoring location was the dominant contributor to noise levels. Distant road traffic on Bradley Court Road to the east of the monitoring location was also audible. Occasional domestic noise from nearby houses was audible at times. Faint and distant noise from Vantage Point Business Village was audible. Occasional aircraft flyover. Wind rustling vegetation audible. Birdsong audible. Dog barking audible on occasion. During the night-time period road traffic from the B4224 was the dominant contributor to noise levels. Distant road traffic from Bradley Court Road to the east of the monitoring location was also audible.
ML4	Road traffic noise on Bradley Court Road to the east of the monitoring location was the dominant contributor to noise levels. Road traffic noise from the B4224 to the southeast of the monitoring location was also audible. Operational noise from Vantage Point Business Village (e.g. HGV traffic, forklift horn and reversing siren) audible. Wind rustling vegetation audible. Aircraft flyovers audible. Birdsong audible. During the night-time period road traffic noise from Bradley Court Road was the dominant contributor to noise levels. Vantage Point Business Village not audible. Humming sound from Electronic Data Systems not audible.

- 3.2 In lulls of local road traffic in the daytime, infrequent activities at Vantage Point Business Village, such as HGV reversing alarms were faintly audible at ML4 only. However, road traffic noise from Bradley Court Road and the B4224, were observed to be the main source of environmental noise levels throughout the daytime.
- 3.3 In lulls of local road traffic during the night-time period, a faint and distant 'hum' was audible at ML2 from plant and equipment at the 'DWC Technologies' premises to the east, which was not audible during the daytime period. However, road traffic noise from Bradley Court Road and the B4224 were observed to be the main source of environmental noise levels throughout the night-time.

Summary and Analysis of Measured Noise Levels

- 3.4 Due to the amount of noise data obtained over the survey period, the measured road traffic noise levels at ML1, ML2 and ML3 are shown graphically as a level-history in **Appendix A2**. It was not feasible to leave a noise monitoring equipment at ML4 during the night-time period. The night-time monitoring results at ML3 have therefore been considered representative of those which would have occurred at ML4. The results of the noise survey at these locations show the general diurnal change in noise levels consistent with a semi-rural location near sources of transportation noise.
- 3.5 **Table 3.2** summarises the results of the environmental baseline noise survey used in this assessment. Full survey data can be provided on request.
- 3.6 Daytime noise levels ($L_{Aeq,16hr}$) have been determined based on the logarithmic average of the measured $L_{Aeq,15min}$ noise levels measured between 07:00hrs and 23:00hrs on Tuesday 18th October 2018 and Wednesday 17th October 2018. Night-time noise levels ($L_{Aeq,8hr}$) have been determined based on the logarithmic average of the measured $L_{Aeq,15min}$ noise levels measured between 23:00hrs and 07:00hrs on Tuesday 16th October 2018 to Wednesday 17th October 2018. The 10th highest measured $L_{Amax,15min}$ during the night-time periods have been adopted for the night-time assessment, with the range of measured maximum noise levels shown in brackets.

Table 3.2: Summary and Analysis of Measured Noise Levels (dB)

Period	ML1		ML2		ML3		ML4 ³	
	$L_{Aeq,T}$	L_{AFmax} (Range)	$L_{Aeq,T}$	L_{AFmax} (Range)	$L_{Aeq,T}$	L_{AFmax} (Range)	$L_{Aeq,T}$	L_{AFmax} (Range)
Daytime (07:00-23:00)	53	-	63	-	57	-	57	-
Night-time (23:00-07:00)	47	68 (33 – 85)	54	78 (37 – 88)	49	69 (32 – 89)	49	69 (32 – 89)

- 3.7 Noise from existing industrial land uses to the east of the Site was not deemed to be at a levels that was potentially significant at any time. Therefore, it is concluded that noise from existing uses is not at a level that would result in an adverse impact on future residents of the proposed Development, and would not conflict with Para 200 of the NPPF, and does not warrant further assessment.

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³ Night-time levels from Monitoring Location ML3 are taken as being representative of night-time values for Location ML4

4 ProPG Noise Risk Assessment

- 4.1 An initial ProPG site noise risk assessment has been undertaken to provide an indication of the likely risk of adverse effects of road traffic noise on an open site basis, excluding any subsequent mitigation measures that may be included as part of the Development.

Assessment Levels

- 4.2 The ProPG site noise risk classification presented in **Table A.1.3** is a sliding scale that does not define precise noise exposure limits to site risk classification and is based on the measured and calculated road traffic noise levels. For the purposes of this assessment, daytime and night-time noise thresholds have been adopted to classify site noise risk and are defined in **Table 4.1**.
- 4.3 The thresholds defined for the 'Low' and 'Medium' site risk classifications have been selected to align with the onset of LOAEL and SOAEL. The 'High' and 'Negligible' risks have been defined using the ProPG site risk classification.

Table 4.1: Site Risk Noise Exposure Thresholds

ProPG Site Risk Category	Daytime Noise Exposure Threshold dB LAeq,16-hour	Night-time Noise Exposure Threshold dB LAeq,8-hour	ProPG Based Pre-Planning Application Advice
Negligible (below LOAEL)	<50	<40	Indicates development site is likely to be acceptable from a noise perspective
Low (LOAEL - SOAEL)	50 – 63	40 – 53 ⁴	Indicates development site is likely to be acceptable from a noise perspective provided that a good acoustic design process is followed and demonstrated
Medium (SOAEL - UAEL)	63 – 70	53 – 66	Indicated site is less suitable from a noise perspective. A subsequent application may be refused unless a good acoustic design process is followed and demonstrated
High (UAEL)	>70	>66	Indicates an increased risk that the development would be refused on noise grounds.

- 4.4 Consideration has also been given to LAF_{max} during the night-time period with reference to the LOAEL and SOAEL thresholds for the LAF_{max} presented in **Table 2.2**.

ProPG Stage 1 – Initial Assessment

- 4.5 The results of the noise survey are shown in summary form in **Table 3.2**, and graphically in **Appendix A2**, and show that in the daytime (when considering the average measured ambient noise level, LAeq,16hr) and at night (when considering both the ambient (LAeq,8hr) and measured maximum

⁴ 53 dB LAeq,8h has been adopted as a noise exposure threshold value for compatibility with Approved Document O – Overheating (this assumes a 13dB attenuation with windows open to achieve 40dB internally)

(L_{AFmax}) noise levels), the Site is at predominantly at 'Low Risk' of adverse noise effects, with land closest to Bradley Court Road at 'Medium Risk' of adverse noise affects.

- 4.6 A Stage 2 full assessment is therefore required, supported by an Acoustic Design Statement (ADS) to demonstrate a good acoustic design process.

Stage 2 - Full Assessment

Internal Noise Levels

- 4.7 For the partially open window scenario, a reduction to noise ingress of 13dB has been assumed, as advocated in ProPG. For the closed window scenario, internal noise levels have been calculated using the rigorous calculation methodology outlined in BS 8233:2014, based on the assumptions detailed in **paragraph 2.15** and **Table 2.3**. **Table 4.2** presents the calculated internal noise levels at all noise monitoring locations (**ML1 – ML4**, **Figure 2.1**) and their correspondence with BS 8233:2014 guidelines and adopted noise design criteria.

- 4.8 It must be noted that all noise monitoring locations were closer to existing roads than dwellings within the proposed developable area identified in **Figure 1.1**. Therefore, the assessment of road traffic noise is considered a reasonably worst-case.

- 4.9 **Table 4.2** shows that with standard thermal double-glazed windows on in/over-frame trickle ventilation, internal noise levels;

- With windows open;
 - exceed the desirable or reasonable BS 8233:2014 criteria and 45 dB L_{AFmax} criteria in at all locations.
- With windows closed;
 - meet the 'desirable' BS 8233:2014 criteria in all habitable rooms, at all times in the northwestern area of the Site (**ML1**)
 - meet the 'reasonable' BS 8233:2014 criteria in living rooms, and achieve the 'desirable' criteria but exceed the 45 dB L_{AFmax} criteria in bedrooms at night, at the western Site boundary (**ML2**)
 - meet the 'desirable' BS 8233:2014 criteria in living rooms and bedrooms but exceed the 45 dB L_{AFmax} criteria in bedrooms at night, on the southern and western site boundaries (**ML3** and **ML4**)

- 4.10 The calculations assume a standard glazing/ventilation solution. Therefore, depending on the final layout, uprated glazing and ventilation may be necessary for dwellings closest and most exposed to road traffic on adjacent roads. Any measures required to reduce road traffic noise to an acceptable level would, by default, also reduce any noise from industrial land uses to the east to an acceptable level.

Commented [DS17]: Has this been done or have the internal noise levels been back-of-a fag packeted?

Commented [SN18R17]: Been done

Commented [DS19]: Not all 3 / 4 locations?? This probably needs updating.

Commented [DS20]: Err... railway?

Commented [DS21]: DS to check

Commented [SN22R21]: Hadn't been updated following completion of the table

Table 4.2: BS 8233:2014 Assessment Assuming a Standard Building Envelope Solution

Commented [DS23]: DS to check these numbers

Location	Window Condition	Living Areas	Bedrooms		Comment
		L _{Aeq} , 16hr	L _{Aeq} , 8hr	L _{Amax} (night)	
ML1	Partially Open	40	34	55	With windows open, meets the 'reasonable' BS 8233:2014 criteria in the daytime, but exceeds BS 8233:2014 guidelines and 45 dB L _{Amax} criterion during the night-time.
	Closed	29	25	44	Achieves all criteria with windows closed.
ML2	Partially Open	50	41	65	With windows open, exceeds BS 8233:2014 guidelines in the daytime and night-time.
	Closed	38	30	55	Achieves 'reasonable' and 'desirable' criteria during the day and night for living rooms and bedrooms (respectively) with windows closed. But exceeds BS 8233:2014 45 dB L _{Amax} criterion during the night-time.
ML3	Partially Open	44	36	56	With windows open, exceeds BS 8233:2014 guidelines in the daytime and night-time.
	Closed	33	26	46	Achieves 'desirable' criteria with windows closed, but just exceeds BS 8233:2014 45 dB L _{Amax} criterion during the night-time.
ML4	Partially Open	44	36	56	
	Closed	33	26	46	
Key					
BS 8233:2014 Internal Noise Levels				Action	
Achieves BS 8233:2014 Guidelines or < 45 dB L _{Amax} in bedrooms ('Desirable' standard)				No Action	
Within +5 dB of BS 8233:2014 Guidelines ('Reasonable' standard)				Mitigate and reduce if sustainable	
Exceeds BS 8233:2014 'Reasonable' Guidelines and/or > 45 dB L _{Amax} in bedrooms				Avoid – sound attenuated measures required	

External Amenity

- 4.11 The measured noise levels summarised in **Table 3.2** show that on an open-site basis and in the absence of any development and any specific noise mitigation measures, daytime noise levels on land very close to existing roads would exceed the adopted noise criteria of 55 dB L_{Aeq,16hr}.
- 4.12 However, when considering the standoff distances between the proposed developable area and nearby roads, daytime road traffic noise levels will be lower outside dwellings and in rear gardens, and are likely to be below 55 dB L_{Aeq,16hr} should the dwellings front adjacent roads to provide self-screening to rear gardens. In the northwest area of the Site external noise levels would be below the adopted noise criteria of 55 dB L_{Aeq,16hr}.
- 4.13 A site-specific Acoustic Design Statement (ADS) is presented in **Section 5**.

5 Acoustic Design Statement (ADS)

- 5.1 Following a good acoustic design process is an implicit part of achieving good design as required by Government planning and noise policy, set out in the Noise Policy Statement for England (NPSE, 2010) the National Planning Policy Framework (NPPF, 2024).
- 5.2 A good acoustic design process should achieve optimal acoustic conditions, both internally and external amenity spaces, but should avoid “*unreasonable*” acoustic conditions. Good acoustic design should prevent “*unacceptable*” acoustic conditions and embrace integrated solutions to deliver the optimum acoustic outcome for a particular site without design compromises that will adversely affect living conditions and the quality of life of the inhabitants or other sustainable design objectives and requirements.
- 5.3 The ProPG assessment in **Section 4** demonstrates that good acoustic design of the proposed development is required, specifically for any noise sensitive development on land closest to Bradley Court Road. The following sections provide acoustic design information that should be considered during the detailed design of the development, prior to any reserved matters application.

Application of the ADS

- 5.4 This ADS is based upon proposed dwellings being located within the developable areas shown in **Figure 1.1**.
- 5.5 Should any layout be brought forward for the Development with dwellings at locations closer to the road, new advice may be required.

Location of Dwellings

- 5.6 The separation distance between the proposed dwellings and existing roads should be maximised as far as reasonably practicable to minimise the sound insulation of the building envelope.
- 5.7 As shown in **Table 4.2**, internal noise levels do not exceed ‘reasonable’ BS 8233:2014 guideline levels with windows closed in dwellings within the proposed developable area considered in this assessment.

External Amenity

Dwelling Orientation, Massing, and Acoustic Screening

- 5.8 As shown in **Section 4** daytime noise levels in the northeast, southeast and western areas of the Site are the highest.
- 5.9 Noise reductions could be achieved in these areas by considering the orientation of the dwellings closest to the B4224 and Bradley Court Road so that the rear gardens are located to the rear of the dwellings with respect to the roads. This will enable the dwellings to self-screen garden areas.

- 5.10 If locating the garden areas on the side of the dwellings away from the roads is not possible, then suitable noise reductions may be achieved by moving the developments further back from the noise sources and/or with the erection of an acoustic fence or brick screening walls around the boundary of rear gardens, or along the Site boundary itself. The specification of the barrier would need to be of a suitable extent and height (typically an acoustic fence of no more than 2.0m high should be sufficient) and shall be determined once the final layout of the proposed development is available.
- 5.11 Should any layout be brought forward for the Site with rear gardens at locations closer to existing roads than shown in **Figure 1.1**, new advice may be required.

Internal Amenity

Glazing and Ventilation

- 5.12 Should dwellings be located closer to the roads in future iterations of the development layout, the sound insulation and ventilation requirements of the dwellings (e.g. glazing, ventilation) and acoustic screening for rear gardens may become more onerous but are not considered a constraint to residential development.
- 5.13 **Table 4.2** indicates that acceptable internal noise levels can be achieved with standard thermal double glazing and ventilation for most the majority of proposed dwellings. Dwellings very close to Bradley Court Road may require uprated glazing and ventilation to achieve internal noise levels in compliance with BS 8233:2014. Example glazing which provides the noise reduction performance summarised in **Table 5.1**. Note that the broadband sound insulation values are provided for guidance only.

Commented [DS24]: Is this for dwellings in the Developable Area or really close to the road?

Table 5.1: Example SRI for Glazing for Rooms (worst-case)

Element	Sound Reduction Index (SRI) at Octave Centre Band Frequency (Hz)								R _w (C; C _{tr})
	63	125	250	500	1k	2k	4k	8k	
Thermal Double-Glazed Windows	21	27	29	36	41	42	52	55	39 (-1; -4)
Element	63	125	250	500	1k	2k	4k	8k	D _{ne,w} (C; C _{tr})
Acoustic Trickle Vent	35	41	42	38	45	47	42	48	42 (0; -4)

- 5.14 The adopted noise criteria will likely be achieved with windows open within rooms on the shielded side of dwellings closest to the roads, as well as for dwellings further back from these noise sources that would benefit from acoustic screening provided intervening dwellings and/or garages.
- 5.15 Consideration of other mitigation options such as internal building layout, as outlined below, will further increase the likelihood that internal noise criteria can be achieved with open windows. This can be determined once details of the proposed development's final layout are available at the reserved matters stage.

Commented [SN25R24]: At ML2 as a worst-case, may get 10m of standoff from ML2 but accurate location not available

Further Considerations for Mitigation

Internal Building Layout

- 5.16 Consideration of the internal building layout (where noise sensitive rooms such as bedrooms could be positioned to the least noise-exposed elevations of the dwellings with respect to existing sources of transportation noise) could afford further reductions to internal noise levels, reducing the need to uprate the building envelope sound insulation and increasing the likelihood that internal noise guideline criteria can be achieved with open windows.

Windows open

Purge ventilation

- 5.17 With regards to openable windows, it should be noted that Building Regulations Approved Document F – Ventilation (ADF) advises that “*purge ventilation*” is required “*for rapidly diluting indoor air pollutants and extracting water vapour where necessary*”. Therefore “purge ventilation” is intermittent, i.e. required only when such occasional activities occur, and open windows are suitable for this purpose.

Control of Overheating

- 5.18 In respect of the control of overheating it is noted that this is now covered by Building Regulations Approved Document O – Overheating (ADO, 2021). ADO introduces noise constraints in respect of bedrooms at night, ensuring that the overheating strategy needs to be cognisant of the noise climate.
- 5.19 Consequently, where the overheating strategy’s reliance upon openable windows is constrained by elevated external noise levels, it will be necessary to explore alternative means of passive ventilation in addition to active means such as positive input ventilation (PIV), or mechanical ventilation heat recovery (MVHR), including tempered air/ peak topping as necessary.
- 5.20 At this stage the overheating strategy has not been developed, and in any event may be subject to change following forthcoming changes to industry guidance. However, by inspection it can be seen from the results of the baseline survey in **Table 3.2** and that night-time noise levels in the proposed developable areas will be lower (due to distance attenuation) than for the majority of the site, internal noise levels within bedrooms should meet Approved Document O – Overheating (ADO, 2021) night-time noise criteria based on a partially open window⁵. Dwellings closest and most exposed to road traffic noise, alternative means of ventilation to control overheating will likely be required.

⁵ The majority of the site is exposed to external noise levels below 50 dB $L_{Aeq,T}$ and 65 dB L_{Amax} at night. Assuming 13dB attenuation for a partially open window (commensurate with an opening area of 2% of the floor area), this results in an internal level of 38 dB $L_{Aeq,T}$ and 52 dB L_{Amax} which is 2dB below the ADO noise limits. This also provides some additional headroom in the event that larger window open areas are required as part of the overheating strategy.

6 Conclusion

- 6.1 This report determines the potential impact of noise upon an outline proposed residential development (the 'Development') for Land at Carisbrook Road, Mitcheldean (the 'Site').
- 6.2 The report describes the existing acoustic environment across the Site based on baseline noise monitoring and observations and evaluates potential impacts upon the proposed Development from road traffic noise which were found to be the main source of environmental noise on the Site.
- 6.3 An initial site risk assessment undertaken in accordance with ProPG demonstrates that the Site is at a likely 'Low - Medium Risk' of adverse effects in the day and night-time (respectively) on an open site basis and in the absence of specific mitigation measures. With windows open, predicted levels in dwellings closest to the Bradley Court Road are expected to exceed the adopted noise criteria, although this is commonly the case for many developments except for those located in remote rural locations.
- 6.4 With windows closed, acceptable internal noise levels can be achieved with an appropriate scheme of glazing and ventilation, if necessary. Therefore, whilst dwellings will be set further back from these roads and noise levels will be lower than have been measured, ventilation and requirements will need to be considered during the detailed design at the reserved matters stage.
- 6.5 The assessment demonstrates that good acoustic design is capable of overcoming any acoustic challenges of the Site and are considered unlikely to give rise to a significant adverse impact on health and quality of life in relation to noise in accordance with paragraphs 187 and 198 of the NPPF nor be in conflict with Para 200 (agent of change) of the NPPF.
- 6.6 In conclusion, the Site is considered suitable for noise-sensitive residential development, provided that a commensurate level of protection against noise is incorporated into the design of the development to secure an acceptable degree of amenity for the future residents. The requirement to incorporate noise mitigation measures into the design and use of the Site can be secured by a carefully worded planning condition, if necessary.

7 Glossary

dB	Decibel. The logarithmically scaled measurement unit of sound.
A-weighting	Frequency weighting applied to measured sound in order to account for the relative loudness perceived by the human ear.
L_{Aeq,T}	A-weighted equivalent continuous sound level over a given time period. It is the sound level of a steady sound that has the same energy as a fluctuating sound over the same time period.
L_{A10,T}	The A-weighted sound level exceeded for 10% of the measurement period. It is widely used as a descriptor of road traffic noise.
L_{A90,T}	The A-weighted sound level exceeded for 90% of the measurement period. Often referred to as the background sound level.
L_{Amax}	The A-weighted maximum recorded noise level during a measurement period.
R_w	The weighted Sound Reduction Index which characterises the airborne sound insulation of a building element over a range of frequencies with a single number quantity.
C and C_{tr}	Spectrum adaption terms that use standard reference curves to determine the weighted value of airborne sound insulation. C and C _{tr} take into account different source spectra, where C considers the A-weighted pink noise spectrum and C _{tr} considers the A-weighted urban traffic noise spectrum.
D_{ne,w}	The normalised weighted airborne sound insulation performance of a ventilation element over a range of frequencies, expressed as a single number.

8 Appendices

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A1 Relevant Policy and Guidance

National Noise Policy

Noise Policy Statement for England (NPSE, 2010)

- A1.1 The Noise Policy Statement for England (NPSE, 2010) sets out the Government's Noise Policy Vision to:

"Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development."

- A1.2 This long-term vision is supported by three Noise Policy Aims that can be delivered through effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development. These aims are to:

1. *avoid significant adverse impacts on health and quality of life;*
2. *mitigate and minimise adverse impacts on health and quality of life; and*
3. *where possible, contribute to the improvement of health and quality of life.*

- A1.3 The explanatory note to the NPSE sets out 'effect levels' which are aligned to the Policy Aims. Drawing upon established concepts from toxicology, the NPSE defines the following noise effect levels:

- NOEL - 'No Observed Effect Level';
- LOAEL - 'Lowest Observed Adverse Effect Level'; and
- SOAEL - 'Significant Observed Adverse Effect Level'.

- A1.4 The explanatory note describes SOAEL as the effect level above which significant adverse effects on health and quality of life occur, aligning this level with the first policy aim.

- A1.5 LOAEL is described as the level at which adverse effects begin and the second aim of the NPSE refers to a situation where the effect lies somewhere between LOAEL and SOAEL. It requires that all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also taking into account the guiding principles of sustainable development however this does not mean that such adverse effects cannot occur.

- A1.6 NOEL is described as a level of noise exposure below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life.

- A1.7 The third aim seeks, where possible, to positively improve health and quality of life through the proactive management of noise while also taking into account the guiding principles of sustainable development, recognising that there will be opportunities for such measures to be taken and that they will deliver potential benefits to society.

- A1.8 The protection of quiet places and quiet times as well as the enhancement of the acoustic environment will assist with delivering this aim.
- A1.9 NPSE states that it is not possible have a single, numerical definition of the SOAEL that is applicable to all sources of noise in all situations, since the SOAEL is likely to be different for different noise sources, for different receptors and at different times.
- A1.10 The setting of LOAELs and SOAELs for transportation sources has however reached a form of consensus following a number of high-profile infrastructure projects in England, namely HS2 and a series of Highways England road schemes which have been successful through the Government's Hybrid Bill and Development Consent Order (DCO) consenting processes.
- A1.11 In these projects, the setting of SOAEL has been aligned to Government policy and legislation in relation to the provision of noise insulation where it has been argued that significant adverse effects can be avoided through these means. **Table A.1.1** provides a summary of the LOAEL and SOAEL values applied on these projects.

Table A.1.1: LOAELs and SOAELs for Road and Projects

Source / Project	Period	LOAEL	SOAEL
Road Traffic (Highway Agency A14 DCO)	Daytime	50 dB LAeq, 16hr	63 dB LAeq, 16hr
	Night-time	40 dB LAeq, 8hr	55 dB LAeq, 8hr

National Planning Policy Framework (NPPF, 2024)

- A1.12 The National Planning Policy Framework (NPPF, 2024) sets out the Government's planning policies for England and how these should be applied. The NPPF provides a framework within which locally-prepared plans for housing and other development can be produced.
- A1.13 In relation to noise, it states:
- "187. Planning policies and decisions should contribute to and enhance the natural local environment by: ...*
- preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and..."*
- A1.14 The NPPF includes policy which makes reference to 'significant adverse impacts on health and quality of life', as per the NPSE. NPPF policy states:
- "198. Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on*

health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

- mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;
- identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason; and...

A1.15 NPPF has also introduces the agent of change principle as follows:

“200. Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or ‘agent of change’) should be required to provide suitable mitigation before the development has been completed.”

Planning Practice Guidance – Noise (PPG-Noise, 2023)

A1.16 The Planning Practice Guidance (PPG-Noise, 2019) provides further detail about how the effects of noise can be described in terms of perception and outcomes. It aligns this to increasing effect levels as defined in the NPSE. In addition, the PPG-Noise adds a fourth term and corresponding effect level:

- UAEL – ‘Unacceptable Adverse Effect Level’.

This effect level is higher than the significant adverse effect on health and quality of life (SOAEL) and requires that unacceptable adverse effects are to be prevented. In PPG-Noise, prevention is not in the context of Government policy on sustainable development. **Table A.1.2** presents the noise exposure hierarchy described in PPG-Noise.

Table A.1.2: Planning Practice Guidance – Noise Exposure Hierarchy

Perception	Examples of Outcomes	Increasing Effect Level	Action
No Observed Effect Level			
Not present	No Effect	No Observed Effect	No specific measures required
No Observed Adverse Effect Level			
Present and not intrusive	Noise can be heard but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			
Present and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g., turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Present and disruptive	The noise causes a material change in behaviour and/or attitude, e.g., avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Present and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g., regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g., auditory and non-auditory	Unacceptable Adverse Effect	Prevent

A1.17 This noise exposure hierarchy is based on the principle that once noise or vibration becomes perceptible, the effect on people and other receptors increases as the level increases. PPG-Noise presents example outcomes to help characterise these effects using non-technical language. In general terms, an observed adverse effect is characterised as a perceived change in quality of life for occupants of a building or a perceived change in the acoustic character of an area, whereas a significant observed adverse effect disrupts activities.

A1.18 PPG-Noise also provides guidance in terms of what factors may influence whether noise could become a concern, and how adverse effects of noise can be mitigated. Examples of mitigation provided include:

- *“engineering: reducing the noise generated at source and/or containing the noise generated;*
- *layout: where possible, optimising the distance between the source and noise-sensitive receptors and/or incorporating good design to minimise noise transmission through the use of screening by natural or purpose built barriers, or other buildings;*
- *using planning conditions/obligations to restrict activities allowed on the site at certain times and/or specifying permissible noise levels differentiating as appropriate between different times of day, such as evenings and late at night, and;*
- *mitigating the impact on areas likely to be affected by noise including through noise insulation when the impact is on a building.”*

A1.19 In the case of residential development, PPG-Noise also states that the impact of noise can be “*partially off-set*” if occupants have access to:

- *“a relatively quiet façade (containing windows to habitable rooms) as part of their dwelling, and/or;*
- *a relatively quiet external amenity space for their sole use, (e.g., a garden or balcony). Although the existence of a garden or balcony is generally desirable, the intended benefits will be reduced with increasing noise exposure and could be such that significant adverse effects occur, and/or;*
- *a relatively quiet, protected, nearby external amenity space for sole use by a limited group of residents as part of the amenity of their dwellings, and/or;*
- *a relatively quiet, protected, external publicly accessible amenity space (e.g., a public park or a local green space designated because of its tranquility) that is nearby (e.g., within 5 minutes walking distance)”.*

Local Planning Policy

Forest of Dean District Council Local Plan

A1.20 Forest of Dean District Council (FDDC) adopted its current 'Local Plan (Core Strategy) Development Plan' document in February 2012 and sets out an overall strategy across the district until 2026.

A1.21 Policy CSP.1 – Design and environmental protection refers to the control of development causing pollution and states that:

"The design and construction of new development must take into account important characteristics of the environment and conserve, preserve or otherwise respect them in a manner that maintains or enhances their contribution to the environment, including their wider context. New development should demonstrate an efficient use of resources. It should respect wider natural corridors and other natural areas, providing green infrastructure where necessary."

Commented [DS26]: Check this is still current

Commented [SN27R26]: I checked this, still current. Think they've got one out for consultation

Guidance

Professional Practice Guidance (ProPG, 2017) on Planning & Noise – 'New Residential Development'

A1.22 Professional Practice Guidance: Planning & Noise – 'New Residential Development' (ProPG, 2017) is a joint publication by the Chartered Institute of Environmental Health (CIEH), the Association of Noise Consultants (ANC) and the Institute of Acoustics (IoA).

A1.23 The primary goal of ProPG is "to assist the delivery of sustainable development by promoting good health and wellbeing through the effective management of noise".

A1.24 The guidance has been produced to assist practitioners in matters relating to noise and new residential development. It focuses on existing transportation noise sources and has been developed to consider the Government's overarching noise policy, planning policy and policy guidance. It has also been developed to take into account other authoritative well-rehearsed sources of guidance such as British Standard 8233:2014 'Guidance on Sound Insulation and Noise Reduction for Buildings' (BS 8233:2014).

A1.25 The guidance provides advice for Local Planning Authorities (LPAs) and developers, and practitioners. ProPG aims to:

- Advocate the full consideration of the acoustic environment from the earliest possible stage of the development control process;
- Promote and encourage the process of good acoustic design in and around new residential developments;
- Set out the considerations which should be taken into account in deciding planning applications for new noise-sensitive developments;

- *Promoting the use of appropriate noise exposure standards and policies in assessment; and*
- *Provide assistance in the delivery of sustainable development.*

A1.26 ProPG advocates a two-stage assessment approach:

- **Stage 1** – an initial noise risk assessment of the proposed development site; and
- **Stage 2** – a systematic assessment considering four key elements.

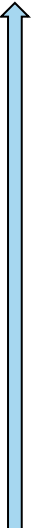
A1.27 ProPG is underpinned by the preparation and delivery of an Acoustic Design Statement (ADS).

Stage 1 – Initial Risk Assessment

A1.28 Stage 1 of ProPG provides guidance to practitioners as to whether the site poses a risk in terms of noise for any future site occupants. To identify this, ProPG sets out a number of considerations for inclusion within an 'initial risk assessment'. **Table A.1.3** reproduces Figure 1 from ProPG, which describes the initial site risk assessment.

A1.29 ProPG is clear that an Acoustic Design Statement should be included as part of a planning application where the risk is anything above 'negligible'.

Table A.1.3: ProPG – Stage 1 Initial Site Risk Assessment

Noise Risk Assessment	Potential Effect Without Noise Mitigation	Pre-Planning Application Advice
Indicative Daytime Noise Levels $L_{Aeq,16hr}$ Indicative Night-time Noise Levels $L_{Aeq,8hr}$ 70 dB 65 dB 60 dB 55 dB 50 dB 45 dB 40 dB High Medium Low Negligible	 Increasing risk of adverse effect	High noise levels indicate that there is an increased risk that development may be refused on noise grounds. This risk may be reduced by following a good acoustic design process that is demonstrated in a detailed ADS. Applicants are strongly advised to seek expert advice. As noise levels increase, the site is likely to be less suitable from a noise perspective and any subsequent application may be refused unless a good acoustic design process is followed and is demonstrated in an ADS which confirms how the adverse impacts of noise will be mitigated and minimised, and which clearly demonstrate that a significant adverse noise impact will be avoided in the finished development. At low noise levels, the site is likely to be acceptable from a noise perspective provided that a good acoustic design process is followed and is demonstrated in an ADS which confirms how the adverse impacts of noise will be mitigated and minimised in the finished development.
	No adverse effect	These noise levels indicate that the development site is likely to be acceptable from a noise perspective, and the application need not normally be delayed on noise grounds.
Notes: a. Indicative noise levels should be assessed without inclusion of the acoustic effect of any scheme specific noise mitigation measures. b. Indicative noise levels are the combined free-field noise level from all sources of transport noise and may also include industrial/commercial noise where this is present but is "not dominant". c. $L_{Aeq,16hr}$ is for daytime 07:00 – 23:00, $L_{Aeq,8hr}$ is for night-time 23:00 – 07:00. d. An indication that there may be more than 10 noise events at night (23:00 – 07:00) with $L_{Amax,F} > 60$ dB means the site should not be regarded as negligible risk.		

Stage 2 – Full Assessment

A1.30 Stage 2 of ProPG describes four elements required for a full assessment. These are:

- **Element 1** – demonstrating a "Good Acoustic Design Process"
- **Element 2** – observing internal "Noise Level Guidelines"
- **Element 3** – undertaking an "External Amenity Area Noise Assessment"; and
- **Element 4** – the consideration of "Other Relevant Issues".

A1.31 A summary of the considerations required in each of the four elements is provided in **Table A.1.4**.

Table A.1.4: ProPG Stage 2 – Summary of Four Key Elements

Element	Potential Effect Without Noise Mitigation
Element 1 Good Acoustic Design Process	Considerations include: - Good acoustic design is not just compliance with recommended internal and external noise exposure standards. Good acoustic design should provide an integrated solution whereby the optimum acoustic outcome is achieved, without design compromises that will adversely affect living conditions and the quality of life of the inhabitants or other sustainable design objectives and requirements. - Using fixed unopenable glazing for sound insulation purposes is generally unsatisfactory and should be avoided. Any reliance upon building envelope insulation with closed windows should be justified in supporting documents The Planning Application MUST: - Check the feasibility of relocating, or reducing noise levels from relevant sources. - Consider options for planning the site or building layout. - Consider the orientation of proposed building(s). - Select construction types and methods for meeting building performance requirements. - Examine the effects of noise control measures on ventilation, fire regulation, health and safety, cost, CDM (construction, design and management) etc. - Assess the viability of alternative solutions. - Assess external amenity area noise.
Element 2 Internal Noise Level Guidelines	Considerations include: - Reference to BS 8233:2014 'Guidance on Sound Insulation and Noise Reduction for Buildings' for internal noise level guidelines - Most residents value the ability to open windows at will, for a variety of reasons, and LPAs should therefore normally request that designers principally aim, through the use of good acoustic design, to achieve the internal noise level guidelines in noise-sensitive rooms with windows open. Where internal noise levels are assessed with windows closed the justification for this should be included in the ADS. In the case of sites exposed to industrial and/or commercial noise: - Where industrial and/or commercial noise is present on the site and is considered to be "dominant" (i.e. where the impact would be rated as adverse or greater (subject to context)) then this is outside the scope of this ProPG and regard should be had to the guidance in BS 4142:2014. - In the special case where industrial and/or commercial noise is present on the site but is "not dominant" (i.e. where the impact would be rated as lower than adverse (subject to context) if a BS 4142:2014 assessment was to be carried out), its contribution may be included in the noise level used to establish the degree of risk in Stage 1 and may also be included in the consideration of Stage 2 Element 2 Internal Noise Level Guidelines (and if included, this should be clearly stated).
Element 3 External Amenity Area Noise Assessment	The assessment must provide and demonstrate: - Full details of the external amenity area noise assessment should be included in an Acoustic Design Statement. - The term "assessment" is deliberately used because this element concerns more than just the level of noise outside. - ProPG external amenity area noise assessment reflects and extends the advice contained in BS 8233:2014 and the current Government guidance in PPG-Noise Where external amenity areas are exposed to "dominant" industrial and/or commercial noise, the impact of the noise should be assessed in accordance with BS 4142:2014 over the time period that the amenity area is likely to be used. In the special case where industrial and/or commercial noise is present on the site but is "not dominant", its contribution may be included in the noise level used to establish the degree of risk in Stage 1 and may also be included in the consideration of Stage 2 Element 3 External Amenity Area Noise Assessment (and if included, this should be clearly stated).

Element	Potential Effect Without Noise Mitigation
Element 4 Assessment of Other Relevant Issues	Consideration should be given to: • Compliance with relevant national and local policy: i.e., NPSE, PPG-Noise and The Environmental Noise Regulations. • Magnitude and extent of compliance with ProPG • Likely occupants of the development • Acoustic design vs unintended adverse consequences: Examples include sealed up balconies that result in a lack of connection with the external environment, roadside barriers that remove views or prevent crossing roads, sealed facades that affect personal control over the internal environment etc. Wherever possible, such unintended adverse consequences should be obviated by good acoustic design. • Acoustic design vs wider planning objectives

Acoustic Design Statement (ADS)

A1.32 ProPG requires that the Acoustic Design Statement (ADS) provides sufficient evidence that the ProPG Stage 1 and Stage 2 Elements 1 – 4 have been followed. It also advises that the ADS should be proportionate to the scale of the development and the degree of noise risk at the proposed development site. In this context, ProPG states that the level of detail to be provided within the ADS should increase with the increasing level of risk.

Sites Exposed to Industrial and/or Commercial Noise

A1.33 In the case of sites exposed to industrial and/or commercial noise, ProPG states that if the industrial and/or commercial noise is present but not dominant, then its contribution may be included in the noise level used to establish the degree of risk.

A1.34 If the industrial and/or commercial noise is considered to be dominant, then the risk assessment should not be applied to the industrial or commercial noise and instead the assessment should follow the methodology and guidance provided in British Standard 4142:2014+A1:2019 '*Methods for rating and assessing industrial and commercial sound*' (BS 4142:2014+A1:2019).

A1.35 ProPG states that "[t]he judgement on whether or not to undertake a BS 4142:2014 assessment to determine dominance should be proportionate to the level of risk. In low risk cases a subjective judgement of dominance, based on audibility, would normally be sufficient."

British Standard 8233:2014 'Guidance on Sound Insulation and Noise Reduction for Buildings' and World Health Organization 'Guidelines for Community Noise'

A1.36 BS 8233:2014 provides guidance for the control of noise in and around buildings. It is applicable to the design of new buildings, or refurbished buildings undergoing a change of use and states that the internal noise levels should take account of the proposed ventilation strategy.

A1.37 BS 8233:2014 provides noise guidance for buildings of different uses, however in respect to dwellings and habitable residential spaces, Table 4 of BS 8233:2014 provides guideline values that it is desirable not to exceed during daytime and night-time periods. These guideline values are reproduced in **Table A.1.5**.

Table A.1.5: Indoor Ambient Noise Levels for Residential Dwellings

Activity	Location	Daytime Guideline (07:00-23:00hrs)	Night-time Guideline (23:00-07:00hrs)
Resting	Living Room	35 dB LAeq, 16hr	-
Dining	Dining Room / Area	40 dB LAeq, 16hr	-
Sleeping (Daytime Resting)	Bedroom	35 dB LAeq, 16hr	30 dB LAeq, 8hr

A1.38 BS 8233:2014 also notes that: *"Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved"*.

A1.39 BS 8233:2014 does not provide specific guidance on noise levels for regular individual noise events, such as passing trains, which can cause sleep disturbance. Guidance on suitable noise levels for individual events is provided in ProPG, which states:

'In most circumstances in noise-sensitive rooms at night (e.g., bedrooms) good acoustic design can be used so that individual noise events do not normally exceed 45 dB LAmax,F more than 10 times a night. However, where it is not reasonably practicable to achieve this guideline then the judgement of acceptability will depend not only on the maximum noise levels but also on factors such as source, number, distribution, predictability, and regularity of noise events.'

A1.40 On this basis, it is considered appropriate to adopt the 10th highest LAmax,F noise event at night for the purposes of the assessment.

A2 Baseline Survey - Instrumentation and Results

Survey Equipment

- A2.1 Noise monitoring was undertaken on a part-attended basis using time-synchronised and fully calibrated Class 1 instrumentation as defined in BS EN 61672-1:2013⁶, calibrated to traceable standards within 2 years of the surveys. Calibration certificates can be provided on request. Details of the instrumentation used is summarised in **Table A.2.1**.
- A2.2 The survey instrumentation was fitted with suitable windshields for the duration of the survey, and located in free-field conditions at a height of 1.4m above local ground.
- A2.3 The sound level meters were set to record several noise parameters, including the ambient (L_{Aeq}), maximum (L_{AFmax}), and background (L_{A90}) sound levels. All sound level meters were configured to capture continuous audio so that it could be reviewed where necessary to identify any noise events during unattended periods, to assist in analysis of the measured noise data.
- A2.4 All noise measurements were conducted, where possible, in accordance with BS 7445:2003⁷ and supplemented by detailed observations of the sound climate at each monitoring location.
- A2.5 Prior to and following the noise measurements, acoustic field-calibration of the sound level meters and microphones used in the survey was performed using an acoustic calibrator. No significant drift (i.e. ≥ 0.1 dB) in the field-calibrated noise level was observed.

Table A.2.1: Baseline Survey Instrumentation

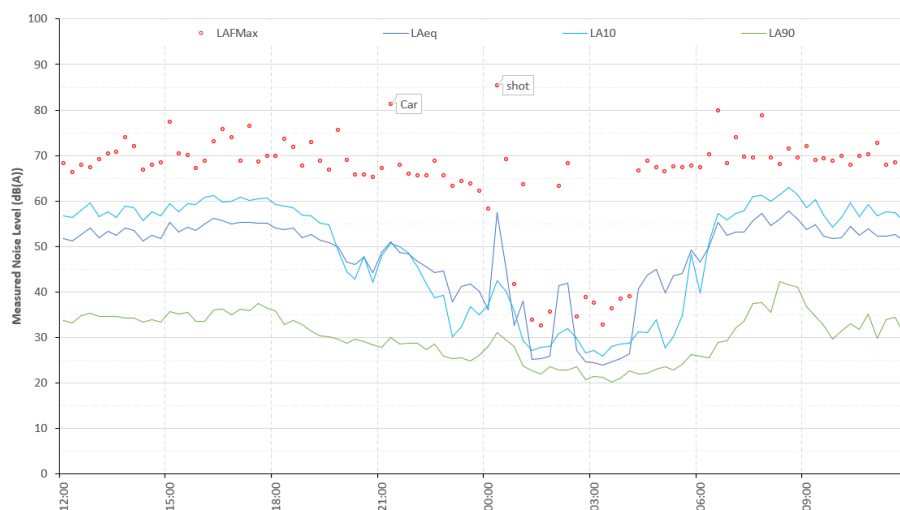
Type	Make	Model / Type	Serial	Date of Last Calibration
Sound Level Meter	Rion	NL-52	01276546	29/03/2018
			01176453	20/03/2018
			00231656	08/03/2017
Acoustic Calibrator		NC-75	35270128	30/03/2018

⁶ BS EN 61672-1:2013 'Electroacoustics. Sound level meters Specifications' (2013)

⁷ BS EN 7445:2003 'Description and measurement of environmental noise. Guide to quantities and procedures' (2003)

Survey Results

Figure A.2.1: Time History, Location ML1 (Unattended Noise Measurements)



Commented [DS28]: You X-axis title is Date and Time, but have no dates. I've clipped the pics to remove the title for simplicity sake

Figure A.2.2: Time History, Location ML2 (Attended/Unattended Noise Measurement)

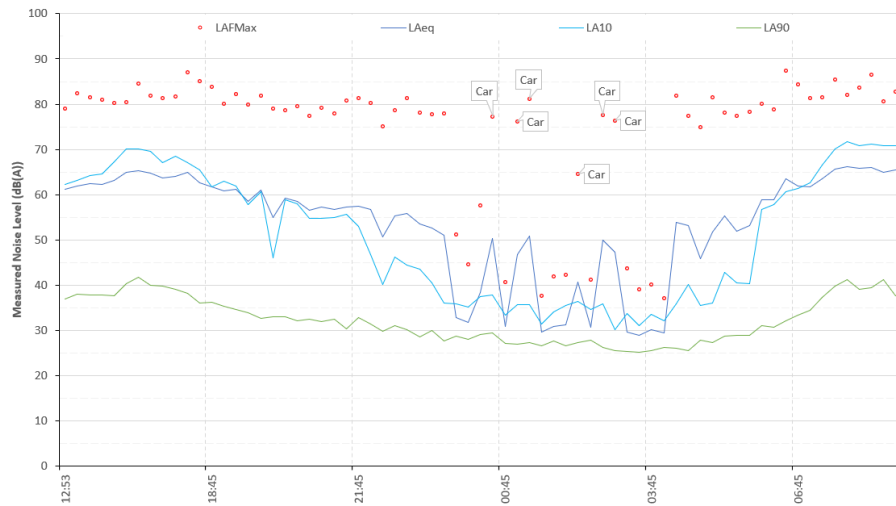


Figure A.2.3: Time History, Location ML3 (Unattended Noise Measurements)

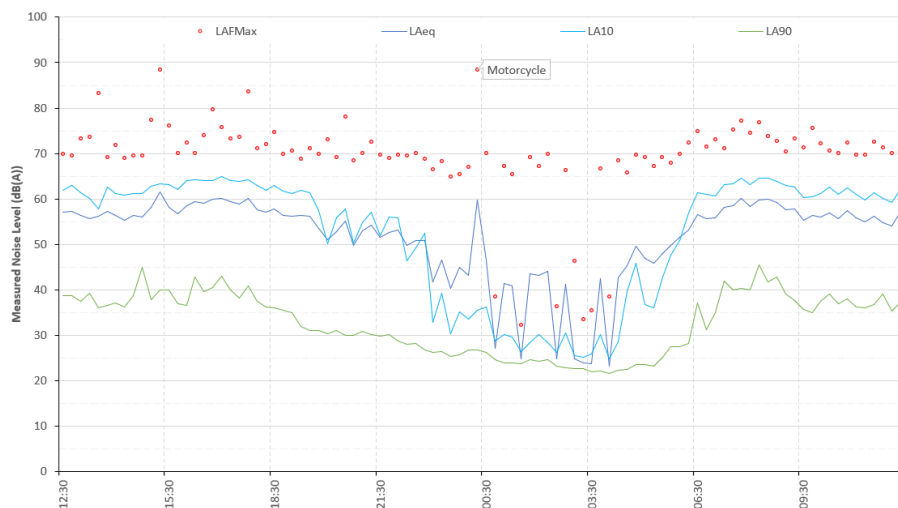


Figure A.2.4: Time History, Location ML4 (Attended Noise Measurements)

