



create

Crest Nicholson Operations Ltd (Chiltern Division)

BARKHAM SQUARE, WOKINGHAM

Acoustic Assessment

Revision C

Independent, multidisciplinary engineering
and environmental consultants

BARKHAM SQUARE, WOKINGHAM

Acoustic Assessment

Document Reference: MT/VL/P24-3255/02 Rev C

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Date: September 2025

DOCUMENT AND QUALITY CONTROL

Revision/Date	Writer	Reviewer	Approver	Nature of Revision
First Issue September 2025	Mat Tuora, BSc (Hons), MloA	Jody Blacklock, BEng (Hons), CEng, MloA, MCIBSE	Jody Blacklock, BEng (Hons), CEng, MloA, MCIBSE	
Revision A 10/10/2025	Mat Tuora, BSc (Hons), MloA	Jody Blacklock, BEng (Hons), CEng, MloA, MCIBSE	Jody Blacklock, BEng (Hons), CEng, MloA, MCIBSE	Layout and modelling updated to reflect latest layout.
Revision B 17/10/2025	Mat Tuora, BSc (Hons), MloA	Jody Blacklock, BEng (Hons), CEng, MloA, MCIBSE	Jody Blacklock, BEng (Hons), CEng, MloA, MCIBSE	Updated based on comments
Revision c 02/02/2026	Ben Dixon, BA (Hons), MloA, ACIEH	Jody Blacklock, BEng (Hons), CEng, MloA, MCIBSE	Jody Blacklock, BEng (Hons), CEng, MloA, MCIBSE	Updated site description

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1.0 INTRODUCTION

- 1.1 Create Consulting Engineers Ltd have been appointed by Crest Nicholson Operations Ltd (Chiltern Division) Ltd to undertake a Noise Impact Assessment at Barkham Square, Wokingham.
- 1.2 The proposal is an outline planning application of up to 660 residential dwellings (Use Class C3) plus elderly care accommodation (Use Class C2/C3) and associated infrastructure on a parcel of land covering an area of 44.89 Ha.
- 1.3 Detailed site layouts have not been provided at this stage of the assessment.
- 1.4 This report contains:
 - a description of the site and the proposed work to be carried out;
 - a summary of international and local policy and standards relevant to this project;
 - the results of the measurements undertaken on site;
 - an assessment of external and internal sound against the relevant standards;
 - a discussion of mitigation requirements;
- 1.5 Recommendations given in this report are for acoustic purposes only. It is the Client's responsibility to ensure that any work carried out complies with other regulations.
- 1.6 A glossary of acoustic terms used in this report is provided in Appendix A.

2.0 EXISTING ENVIRONMENT AND SITE PROPOSALS

- 2.1 The application site is located southwest of Wokingham to the northeast of Arborfield Green. The site is currently undeveloped. We understand however, that the surrounding area has undergone recent residential development and this site is considered an expansion to this.
- 2.2 The site is bounded by Langley Common Road to the northwest and Common Field Lane to the southeast. The M4 is located approximately 3.3 km to the north of the site.
- 2.3 The proposed site location and surrounding area is shown below.

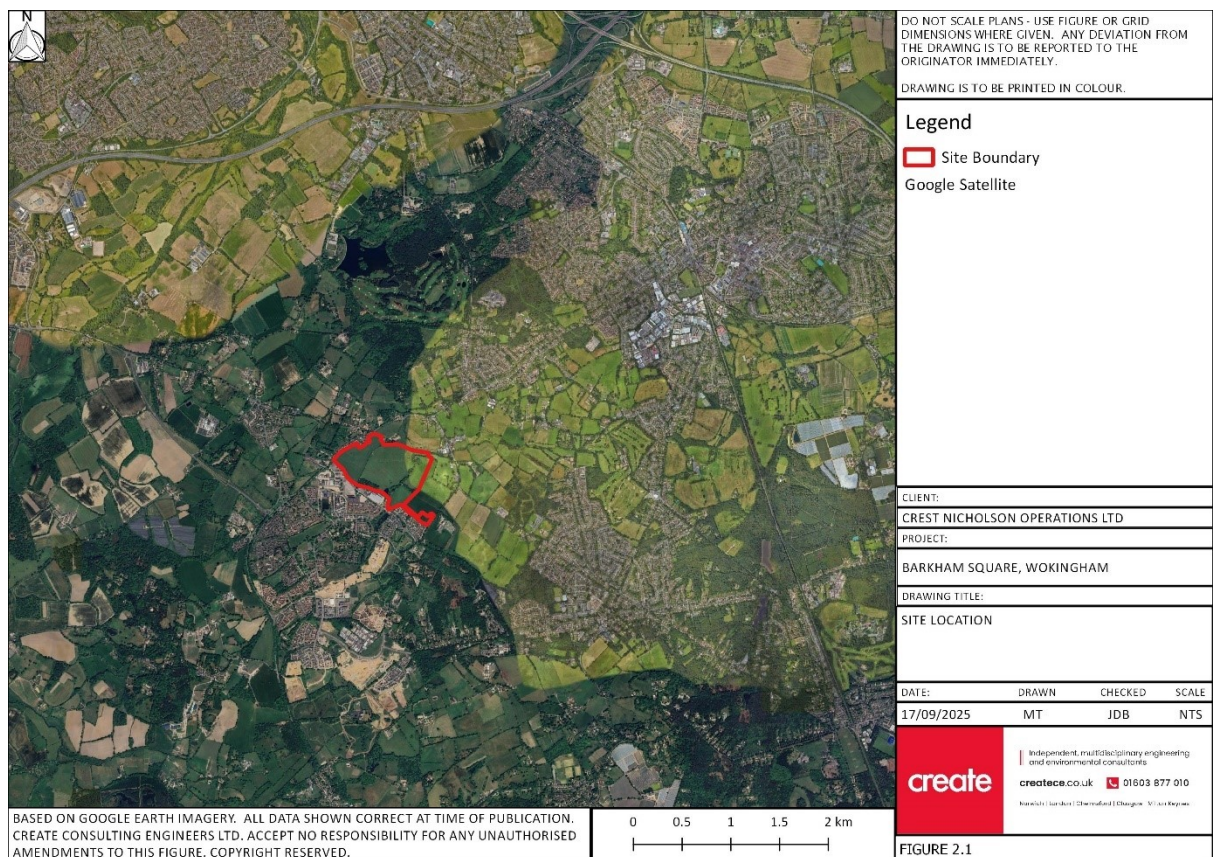


Figure 2.1: Site Location

- 2.4 The proposed site masterplan layout is shown below.

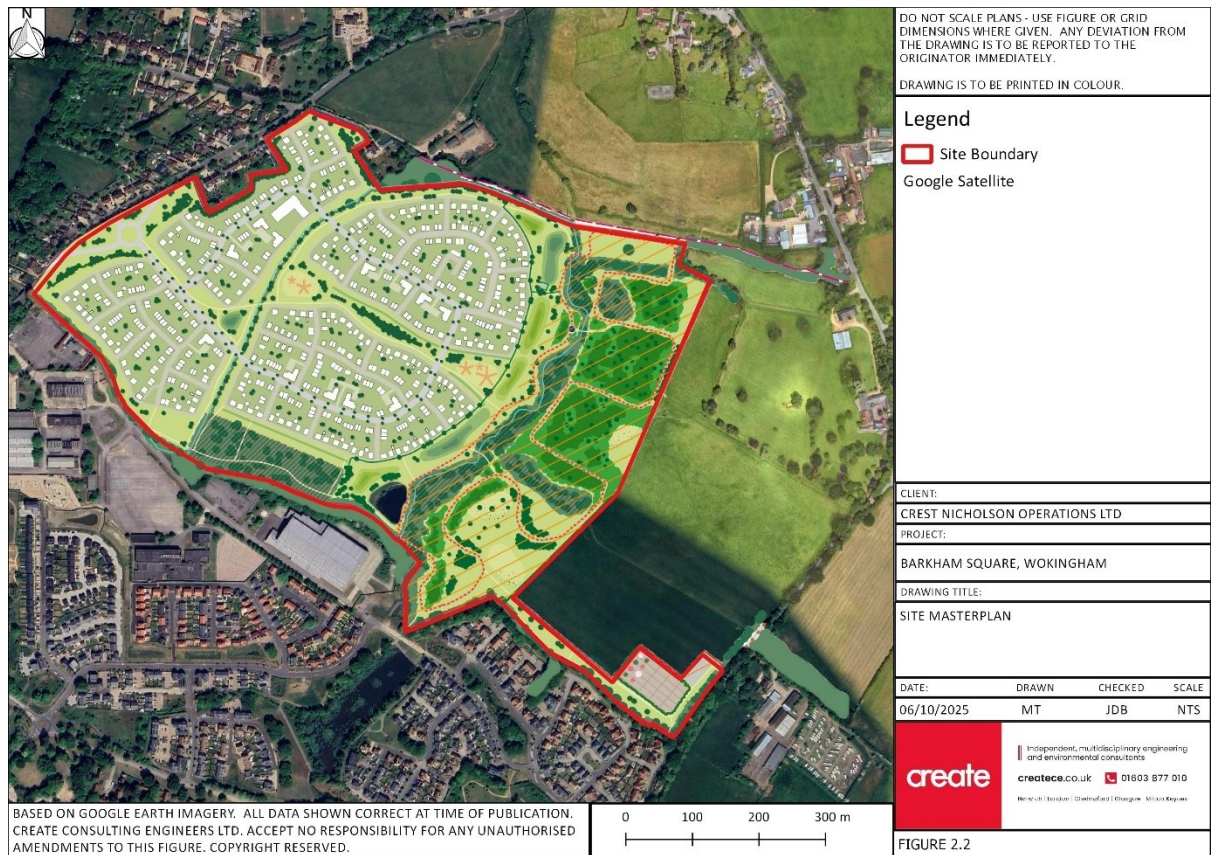


Figure 2.2: Site Masterplan (Outline)

3.0 POLICY, STANDARDS AND CRITERIA

National Policy

- 3.1 A summary of the National Planning Policy Framework, National Planning Practice Guidance and the Noise Policy Statement for England is provided in Appendix B of this report.

Local Policy

- 3.2 The site falls within the jurisdiction of Wokingham Borough Council. The Adopted Core Strategy Development Plan Document (January 2010) and Wokingham Borough Development Plan (February 2014) contain policy and guidance in relation to ensuring suitable acoustic conditions for new development.
- 3.3 Policy CC06: Noise of the 2014 Development Plan states that it should be read alongside Policy CPI of the Core Strategy.
- 3.4 Policy CPI of the Core Strategy Development Plan states the following in regard to noise pollution:

CPI – Sustainable development

Planning permission will be granted for development proposals that:

...

- 8) Avoid areas where pollution (including noise) may impact upon the amenity of future occupiers;*

...

- 3.5 The supporting text under this section then goes on to say that:

The community, Government and regional policy (PPG24 & SEP Policy NRM10 respectively) recognise the need for proposals to avoid areas of noise. Within the borough, noise issues arise in a variety of locations including alongside the major roads (M4 & A329(M)/A3290) and the railway lines within the Strategic Transport Network (see paragraph 4.56). Proposals should have regard to the advice in PPG24 concerning the suitability of different locations (based on noise exposure levels) for a variety of activities and the Air Quality Management Areas of the borough. The LAA includes targets for dealing with local concerns about anti-social behaviours and crime. Initiatives such as 'Secured by Design' can make a contribution to this.

- 3.6 The following key design principles are also included in this document:

Key Design Principles

A7.40 A master plan for the SDL should demonstrate adherence to current best practice in urban design, to include:

- a) A layout based on the extension and connection of the town's movement network and neighbourhood structure. This should form the basis for a continuous network of streets to permit a high level of connectivity at the local level. Within this network a legible hierarchy should distinguish between routes designed for through movement and low order residential streets which should have an emphasis on shared surfaces. Higher order routes should be designed according to the principles set out in the Department of Transport's 'Manual for Streets'.*
- b) A positive response to the topography of the site and existing tree planting, which should be incorporated into the layout.*

- c) *New local facilities, including the primary school, located to be easily accessible to new and existing households.*
- d) *A well connected network of open space to include provision for formal and informal recreation, SANGS provision, and mechanisms to mitigate against noise and odour.*
- e) *Consideration of the site topography should be reflected in the layout of the development.*
- f) *Development which is inclusive and accessible for all in accordance with Policy CP2.*
- g) *Architectural design which is high quality and distinctive, and a sense of visual cohesion. New buildings should reflect the character of existing high quality architecture in the Borough as well as current best practice. Regard must be given to the Borough's Residential Design Guide.*
- h) *h) Public art which is integral within the design of the development.*
- i) *Careful attention to the composition of the street frontage and street corners to ensure a continuous building line and help define the street. Long featureless blank frontages should be avoided.*
- j) *Vehicle parking, in all forms, which is integrally planned to ensure it does not compromise the visual and residential amenity of the place.*
- k) *A phasing strategy which prioritises the provision of non-vehicle links, landscape planting and education within the early years of the scheme.*
- l) *A phasing strategy that ensures easy access to Wokingham town centre through the entire delivery of the development*

3.7 Wokingham Borough Council are currently working on a new Local Plan, which the latest version, Wokingham Borough Local Plan Update 2023 – 2040 Proposed Submission Plan. In order to undertake a thorough assessment of the proposals, we have also reviewed against the policies from this document, which have been assumed will replace the policy CP1 of the current version of the Core Strategy.

3.8 Within this updated Local Plan, noise and vibration have been noted to have tenuous links to several policies, the main policy referring to noise however is Policy HC8: Noise Pollution.

3.9 Policy HC8 requires the following to be satisfied;

HC8 – Noise Pollution

- 1) *Development proposals must demonstrate how noise impacts have been addressed, to protect sensitive receptors, including existing and proposed dwellings.*
- 2) *The noise impact of the proposed development must be assessed. Where there is no adverse impact (no observed effect level), noise pollution will not be a material consideration.*
- 3) *Where there is an adverse effect (ranging from the lowest observed effect level to a significant observed effect level), then the following approaches must be taken in the order listed;*
 - a. *The development must be reviewed. Where this results in there no longer being an adverse impact then design and mitigation measures should be incorporated accordingly;*
 - b. *Where there is still an adverse impact, the internal review must be reviewed. Where this results in there no longer being an adverse impact, then design and mitigation measures should be incorporated accordingly;*
 - c. *Where there is still an adverse impact, physical mitigation measures such as barriers/mechanical ventilation must be considered. Where this results in there no longer being an adverse impact, these measures should be incorporated accordingly;*
 - d. *Where there is still an adverse impact and the development falls within the significant observed adverse effect level, then planning will normally be refused.*
- 4) *Adverse impacts on sensitive environmental receptors, such as wildlife corridors, should be avoided or comprehensively mitigated where avoidance is not possible.*

3.10 Policy DH2: Safeguarding amenity also identifies the need for noise, vibration and disturbance to be considered in the design of development proposals.

3.11 Policy DH2 requires the following to be satisfied;

Policy DH2: Safeguarding amenity

- 1) Development proposals must ensure there are no unacceptable impacts on the amenity of existing or future occupiers. This includes the impact of individual development or, cumulatively, in combination with other development.
- 2) Development proposals should be sensitively designed and provide measures to avoid and/or mitigate against existing or potential impacts, in terms of:
 - a. Loss of privacy and overlooking;
 - b. Unacceptable overshadowing and a loss of daylight/sunlight;
 - c. Visual intrusion, dominance or undue sense of enclosure, or an overbearing impact or harmful loss of outlook;
 - d. Noise, vibration and disturbance;
 - e. Artificial light pollution;
 - f. Odour, dust and fumes; and
 - g. Crime or the perception of unsafe environments.
- 3) Development proposals that would generate regular movements of HGVs and commercial traffic in residential areas must demonstrate how the impacts of noise, vibration, dust and fumes will be minimised in both the construction and operational phases.
- 4) Where necessary and appropriate, to protect the amenity of neighbouring occupiers planning conditions will be used to restrict hours, area(s) and the type(s) of use or operation.

Standards and Guidance

3.12 In addition to the local policy there are a number of national standards and guidance which are accepted as appropriate for the rating and assessment of impact from noise to and from development.

3.13 These are summarised below:

ProPG: Planning & Noise – New Residential Development (2017)

3.14 The Professional Practice Guidance on Planning and Noise (ProPG) has been developed by a working group consisting of representatives of the Association of Noise Consultants (ANC), Institute of Acoustics (IOA) and Chartered Institute of Environmental (CIEH).

3.15 The approach detailed in this guidance includes a framework to clearly determine situations where noise is not an issue, and to help identify the extent of risk at noisier sites.

3.16 This ProPG advocates a systematic, proportionate, risk based, 2-stage approach to assessing the risk of noise to future development, as follows:

- Stage 1 – an initial noise risk assessment of the proposed development site, considered to support wider Government planning and noise policy; and
- Stage 2 – a systematic consideration of four key elements;
 - 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 – consideration of “Other Relevant Issues

3.17 The document advocates an assessment in a graduating manner from Negligible to High Risk as shown in the following figure:

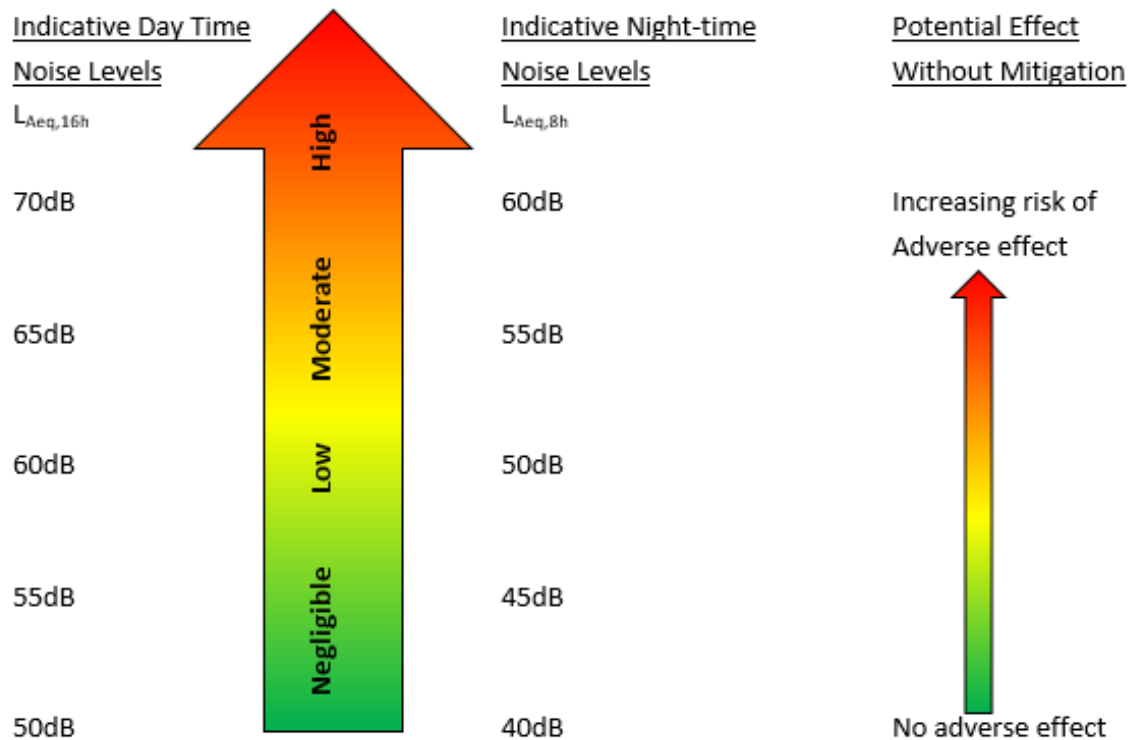


Figure 3.1: Initial Site Risk Assessment Using Fig. 1 of ProPG

- 3.18 This document states that “an indication that there might 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.”
- 3.19 The approach outlined above, is underpinned by the preparation of an Acoustic Design Statement (ADS). This ADS should be more detailed for a site assessed as being ‘high-risk’, and less detailed for a site assessed as being ‘low-risk’. This approach will result in one of four recommendations for the site; “grant without conditions”, “grant with conditions”, “avoid” or “prevent”.

WHO: Environmental Noise Guidelines (2019)

3.20 In 2019 WHO Environmental Noise Guidelines was released. This document provides recommendations for protecting human health from exposure to environmental noise originating from various noise sources, such as:

- Transportation (road traffic, railway & aircraft);
- Wind Turbine; &
- Leisure Noise

3.21 Although the document addresses these issues in broad terms, it does not supersede the 1999 community noise guidelines which are more applicable in this instance.

WHO: Guidelines on Community Noise (1999)

3.22 The WHO Guidelines for Community Noise state the following guideline values for noise in specific environments, as can be seen in Table 3.1.

Specific Environment	Critical Health Effects	L _{Aeq,T} (dB)	L _{AMAX,fast} (dB)
Dwelling, indoors	Speech intelligibility and moderate annoyance	35	-
Inside bedrooms	Sleep disturbance, night-time	30	45
Outdoor living area	Serious annoyance, daytime and evening	55	-
	Moderate annoyance, daytime and evening	50	-

Table 3.1: WHO Guideline Values for Community Noise

3.23 The document also states:

‘For a good sleep, it is believed that indoor sound pressure levels should not exceed approximately 45dB L_{AMAX} more than 10-15 times per night (Vallet & Varnet, 1991).’

3.24 These levels are reflected in the guidance provided in BS 8233 (2014).

BS 8233 (2014) Guidance on Sound Insulation and Noise Reduction for Buildings

3.25 British Standard 8233 (2014) ‘Guidance on sound insulation and noise reduction for dwellings’ provides contains guidance on limits for internal noise in common types of domestic and non-domestic buildings. The guidance is primarily intended for steady, continuous sources (such as noise from road traffic), but are also commonly used to provide a reasonable basis for assessing the suitability of noise levels within a dwelling. Careful interpretation and application of the guideline noise levels is often necessary.

3.26 The standard suggests the following internal ambient noise levels for dwellings:

Activity	Location	Day-Time Period	Night-Time Period
		07:00 – 23:00	23:00 – 07:00
Resting	Living Room	35 dB $L_{Aeq,16hour}$	-
Dining	Dining Room/Area	40 dB $L_{Aeq,16hour}$	-
Sleeping	Bedroom	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,8hour}$

NOTE 7 – 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

Table 3.2: BS 8233 (2014) Indoor Ambient Noise Levels

3.27 Note 4 of Section 7.7.2 of BS 8233 states:

“Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or $L_{Amax,F}$ depending on the character and number of events per night. Sporadic noise events could require separate values.”

3.28 Note 5 of BS 8233 states:

“If relying on closed windows to meet the guide values, there needs to be appropriate alternative ventilation that does not compromise the façade insulation or the resulting noise level.”

3.29 Section 7.7.3.2 recommends that noise levels in external amenity areas should ideally not exceed 50 dB $L_{Aeq,T}$ and that 55 dB $L_{Aeq,T}$ should be considered as an upper limit. BS 8233 does, however, note that these values are guidelines and may not be achievable in all circumstances where development might be desirable.

BS 4142 (2014) + AI (2019) Methods for Rating and Assessing Industrial and Commercial Sound

3.30 The British Standard 4142 (2014) describes methods for rating sound of an industrial and/or commercial nature to assess its likely effects on people who might be inside or outside a dwelling or premises used for residential purposes upon which the sound is incident.

3.31 BS 4142 specifies that an initial estimate of the impact of the specific sound can be obtained by subtracting the measured background sound level from the rating level and then considering the following:

- Typically, the greater this difference, the greater the magnitude of the impact;
- A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context;
- A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context; and
- The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

- 3.32 The rating level is defined in BS 4142 as the sound level of the source plus any penalties for the characteristic features of the sound, such as tonality and impulsivity among others. Acoustical characteristics and associated penalties are shown in Table 3.3:

Acoustic Character	Subjective Level	Correction
Tonality	Just perceptible	+2 dB
	Clearly perceptible	+4 dB
	Highly Perceptible	+6 dB
Impulsivity	Just perceptible	+3 dB
	Clearly perceptible	+6 dB
	Highly Perceptible	+9 dB
Intermittency	Readily distinctive	+3 dB
Other sound characteristics	Readily distinctive	+3 dB

Table 3.3: Acoustical Characteristics for Determining the Rated Sound Level

- 3.33 The above correction values are based on the subjective nature of the sound, however BS 4142 also provides detailed guidance on objectively calculating the correction factors, which are included within Annexes C, D and E of the British Standard.
- 3.34 This latest version of the British Standard states that the most relevant background sound level should be applied for the most relevant time period and should reflect the period which is being assessed. This could include the use of statistical analysis or averaging to calculate the most applicable background sound level.

BS 5228-1 (2009) +A1 (2014) Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1: Noise

- 3.35 The British Standard 5228 – Part 1 (2009) gives recommendations for basic methods of noise control relating to construction sites, including sites where demolition, remediation, ground treatment or related civil engineering works are being carried out, and open sites, where work activities/operations generate significant noise levels, including industry-specific guidance.
- 3.36 The legislative background to noise control is described and recommendations are given regarding procedures for the establishment of effective liaison between developers, site operators and local authorities. This part of BS 5228 provides guidance concerning methods of predicting noise and assessing its impact on those exposed to it.
- 3.37 The document contains a method of setting noise limits to surrounding areas, referred to as the 'ABC Method'. In essence, the residual ambient noise level (LAeq,T) is determined and rounded to the nearest 5 dB, this is then compared against the category A threshold. A site operating above the defined threshold has the potential to generate a significant effect.
- 3.38 The threshold values and method to determine these is shown in Table 3.4 below:

Assessment category and threshold value period	Threshold value (dB)		
	Category A ^{A)}	Category B ^{B)}	Category C ^{C)}
Night-time (23:00 - 07:00)	45	50	55
Evenings and weekends ^{D)}	55	60	65
Daytime (07:00 - 19:00) and Saturdays (07:00 - 13:00)	65	70	75
NOTE 1 - A potential significant effect is indicated if the $L_{Aeq,T}$ noise level arising from the site exceeds the threshold level for the category appropriate to the ambient noise level. NOTE 2 - If the ambient noise level exceeds the category Category C threshold values given in the table (i.e. the ambient noise level is higher than the above values), then a potential significant effect is indicated if the total $L_{Aeq,T}$ noise level for the period increases by more than 3 dB due to site noise. NOTE 3 - Applied to residential receptors only. ^{A)} Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values. ^{B)} Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as Category A values. ^{C)} Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are greater than Category A values. ^{D)} 19:00 - 23:00 weekdays, 13:00 - 23:00 Saturdays and 07:00 - 23:00 Sundays			

Table 3.4: The ABC Method

4.0 MEASUREMENT SURVEY

- 4.1 We attended site on the 23rd of July 2024 to undertake a site survey. Two two logging sound level meters were deployed on site for a period of approximately nine days. During our survey we also undertook a site walkover and took a series of attended measurements over the site.
- 4.2 During the site visit we noted that planes passing over the site were clearly audible. Due to the topography of the site the road traffic on Langley Common Road to the northwest was not clearly audible over much of the site. Road traffic from distant roads was also not considered particularly audible. Some infrequent vehicle movements were noted on Common Field Lane to the southeast. However, the frequency of the vehicles passing the site was very low and were considered unlikely to cause an adverse impact. Attended measurements were taken in this location to ensure that noise levels were considered in the assessment.
- 4.3 As discussed above, plane noise was considered the primary source of noise, although as will be shown later in this report, is unlikely to adversely impact the development proposals.
- 4.4 The following image shows the Heathrow 2015 noise contour map, and the location of the site.

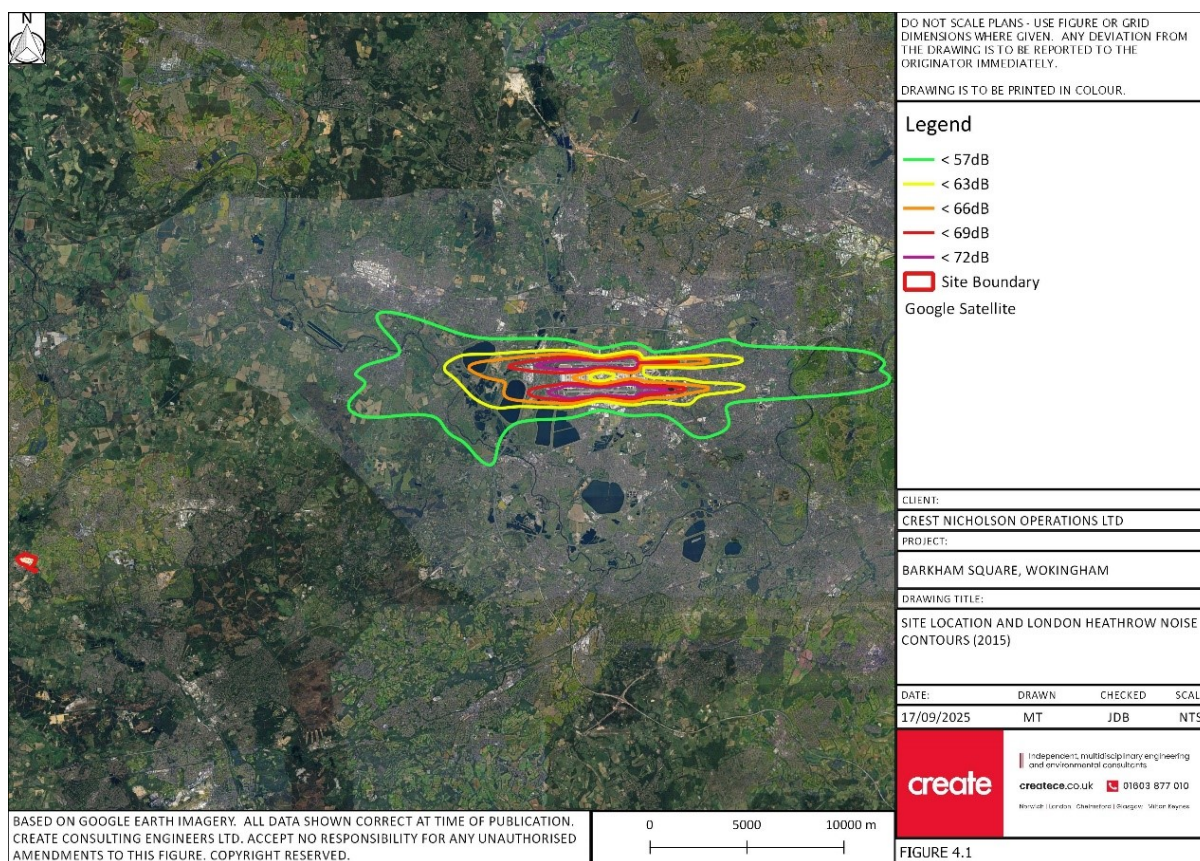


Figure 4.1: Heathrow Noise Contours (2015)

- 4.5 It can be seen that the site falls significantly outside of the 57 dB contour which is the lowest contour reported as part of the Heathrow noise management plan. These levels are in terms of $L_{Aeq,16\text{-hours}}$ and represent the daytime contours only.

- 4.6 From a review of figures 3.1 and 3.4 of the supporting annexes for Heathrow Airports Noise Action Plan 2024 to 2028, it can be seen that the site is under the flight path for westerly operations departures and the easterly operations arrivals. The aircraft are generally above 4000ft when they are overhead.
- 4.7 The measurement locations used for our survey are shown in the figure below:

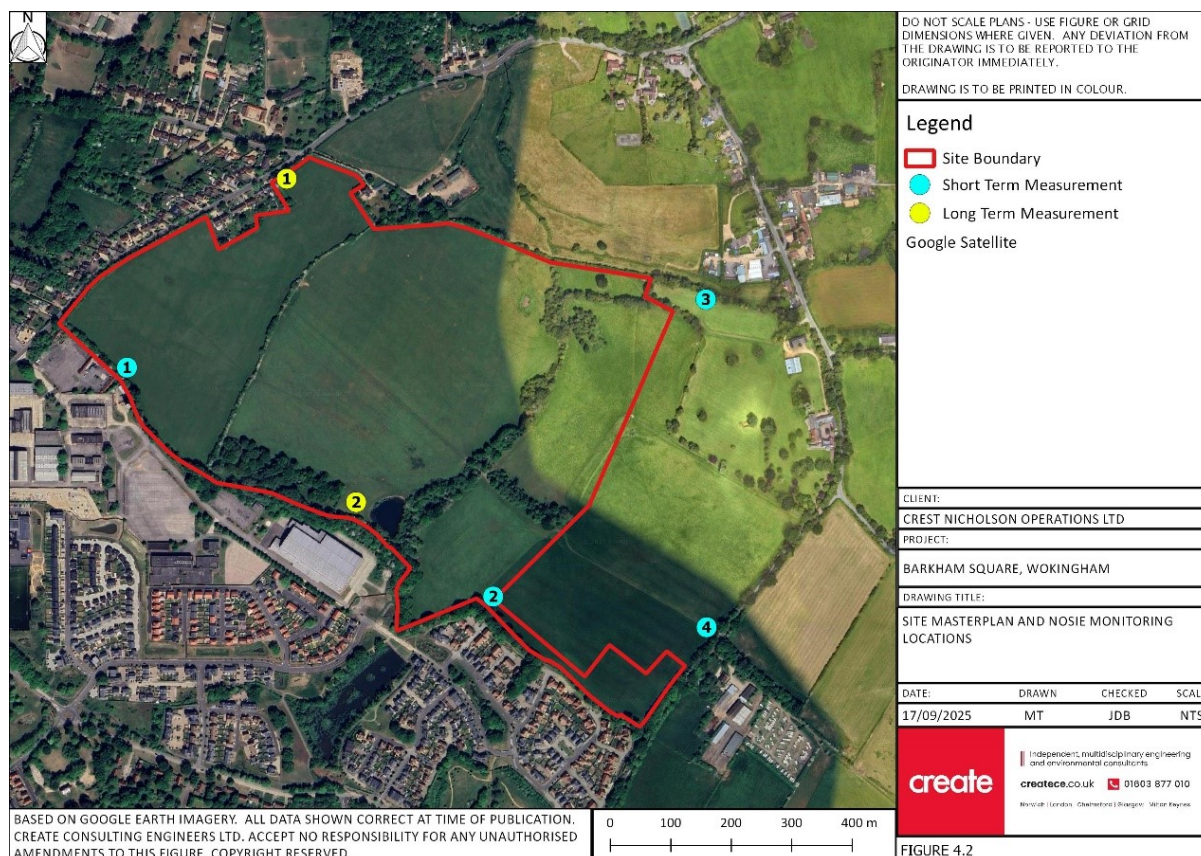


Figure 4.2: Measurement Locations

- 4.8 All measurements were taken at a height of 1.5 m above ground in terms of, L_{eq} , L_{90} , L_{max} and A-weighted levels. The results of our survey are summarised in Section 5.0.
- 4.9 The equipment was calibrated at 113.9 dB at 1 kHz before the survey. There was no significant drift noted over the course of the survey. A summary of equipment used, and calibration information is contained in Appendix C of this report.
- 4.10 Weather was logged on PCE-FWS-20N weather station with data logger over the duration of the survey. Weather throughout our survey was generally considered suitable for environmental acoustic surveys.
- 4.11 Temperatures ranged from 7 degrees Celsius to 31 degrees Celsius. Wind remained below 5 m/s. Very light rain was noted between 23:00 and midnight on the 24th of July and around mid-day on the 25th of July. We would not expect these infrequent periods of rain to impact either the statistical or energy averages of this assessment and we have not excluded these periods from the data processing.

5.0 RESULTS

Ambient Sound Levels

Daytime

- 5.1 Ambient noise levels measured during the daytime ranged between 58 dB $L_{Aeq,16\text{-hour}}$ and 61 dB $L_{Aeq,16\text{-hour}}$ in measurement position 1 and ranged between 40 dB $L_{Aeq,16\text{-hour}}$ and 47 dB $L_{Aeq,16\text{-hour}}$ in measurement position 2.
- 5.2 The average daytime noise levels measured over the course of the survey were 60 dB $L_{Aeq,16\text{-hour}}$ and 45 dB $L_{Aeq,16\text{-hour}}$ in positions 1 and 2 respectively.

Night-time

- 5.3 Ambient noise levels measured during the night-time ranged between 50 dB $L_{Aeq,8\text{-hour}}$ and 52 dB $L_{Aeq,8\text{-hour}}$ in measurement position 1 and ranged between 34 dB $L_{Aeq,8\text{-hour}}$ and 41 dB $L_{Aeq,8\text{-hour}}$ in measurement position 2.
- 5.4 The average night-time noise levels measured over the course of the survey were 51 dB $L_{Aeq,8\text{-hour}}$ and 39 dB $L_{Aeq,8\text{-hour}}$ in positions 1 and 2 respectively.

Propagation

- 5.5 Noise levels measured during the attended measurements in positions 1 and 3 are comparable to the levels measured in the unattended measurement position 2. While measurements in positions 2 and 4 were 2 dB higher.
- 5.6 This would suggest that some road traffic activity on Common Field Lane may have contributed to the ambient noise levels in the area, however, when applying this difference over the long term averages sound levels it is clear that the wider site, including areas close to Common Field Lane are low and would not require dedicated acoustic mitigation to meet local or national policies.

Max Sound Levels

- 5.7 The WHO Guidance states:

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

- 5.8 The survey includes noise levels measured over nine night-time periods. We have therefore taken the 90th highest max level as representative for this survey.
- 5.9 Typically, maximum noise events were from vehicles passing the site close to the road. It is also expected that the dawn chorus has contributed to a number of the maximum events captured in this survey. As will be seen later in this report the impact of the dawn chorus on the maximum noise levels are unlikely to alter the outcome of this assessment.

5.10 Representative night-time L_{AFmax} was found to be 73 dB $L_{AFmax,1-minute}$ and 58 dB $L_{AFmax,1-minute}$ in positions 1 and 2 respectively.

Background Sound Levels

5.11 Histograms of the daytime and night-time measurement results are shown in the following figures:

Daytime

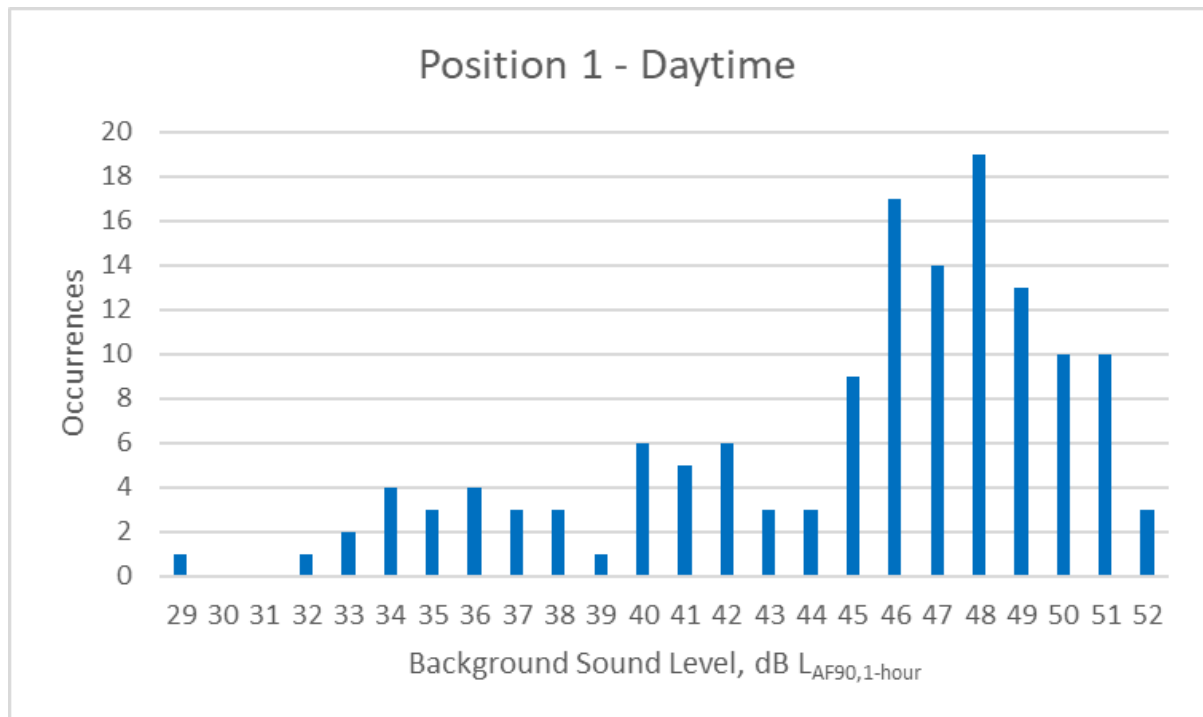


Figure 5.1: Histogram Of Daytime Background Sound Levels In Position 1

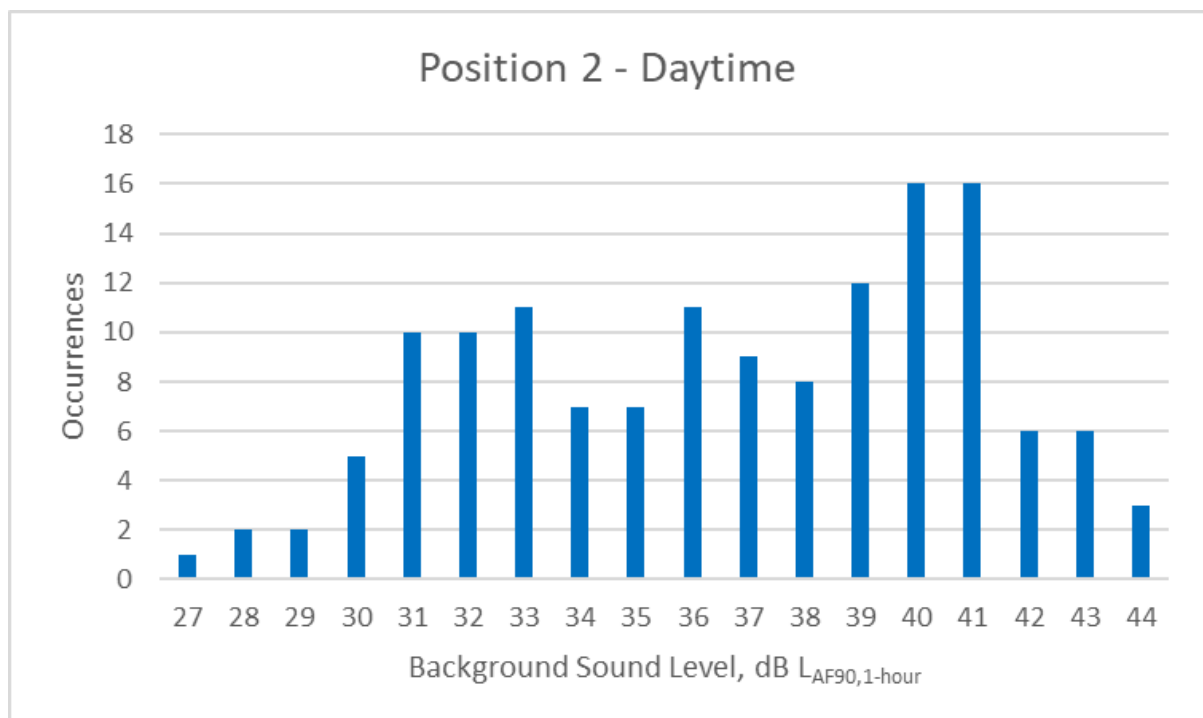


Figure 5.2: Histogram Of Daytime Background Sound Levels In Position 2

Night-time

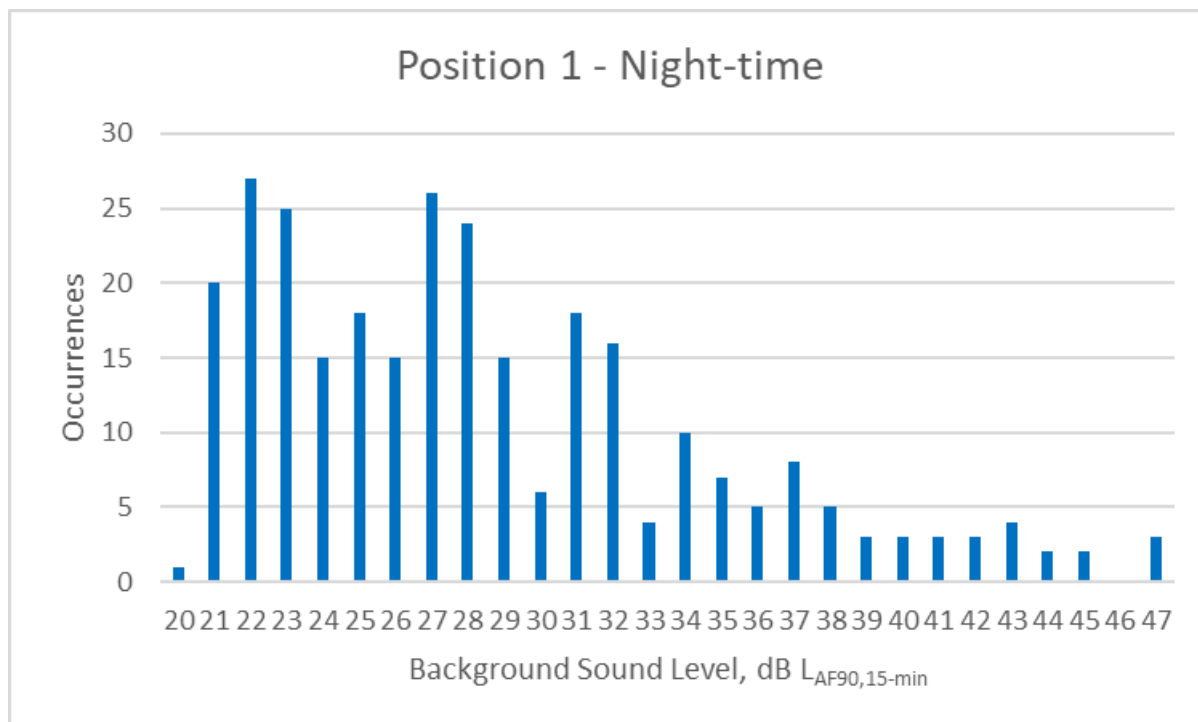


Figure 5.3: Histogram Of Night-time Background Sound Levels In Position 1

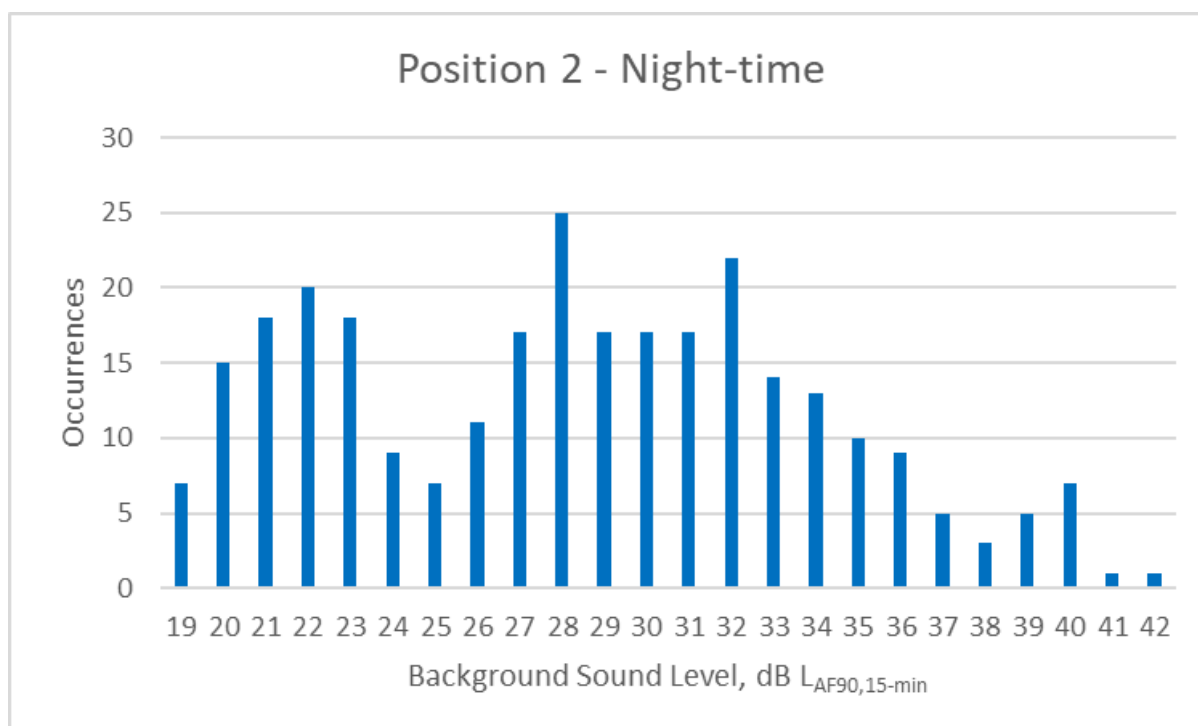


Figure 5.4: Histogram Of Night-time Background Sound Levels In Position 2

- 5.12 It can be seen that background sound levels in Position 1 are generally higher during the daytime than in Position 2. This indicates that the road traffic on Langley Common Road is relatively frequent throughout the majority of the daytime.

- 5.13 During the night-time the background sound levels across the site are more similar which indicates that they are likely impacted by distant noise from the surrounding infrastructure and not local roads or noise sources.
- 5.14 We have considered 46 dB $L_{A90,1\text{hour}}$ and 40 dB $L_{A90,1\text{hour}}$ to be representative during the daytime in Positions 1 and 2 respectively. During the night-time we have considered 28 dB $L_{A90,15\text{mins}}$ to be representative of the entire site.
- 5.15 The background sound levels measured during the night-time were low. Indeed the 1997 version of BS 4142 states that "The method is not suitable for assessing the noise measured inside buildings or when the background and rating noise levels are both very low. *NOTE. For the purposes of this standard, background noise levels below about 30 dB and rating levels below about 35 dB are considered to be very low.*"

6.0 ASSESSMENT

Assessment of Road Traffic

- 6.1 The overall site is considered to have a negligible to low risk when considered against the guidance in ProPG.
- 6.2 It is typically considered that a 15 dB level difference can be achieved across a partially open window.
- 6.3 Measurements obtained in the long term measurement position 1 would be considered above the point at which a partially open window could be used to naturally ventilate the property during normal background ventilation conditions.
- 6.4 Based on the survey measurements and our observations on site, we consider the primary source of noise impacting the site to be from road traffic on the Langley Common Road.
- 6.5 Data collected from Common Field Lane shows this road is relatively quiet. However, the traffic information for the project predicts a 12% increase without development for the 2035 prediction, which our calculations show would result in a 0.5 dB increase to the road levels. As only attended survey measurements were carried out in this location, we have relied on the transport data to predict propagation of noise from this noise source in accordance with CRTN (Calculation of Road Traffic Noise).
- 6.6 We have also adjusted road traffic levels on Langley Common Road in line with the transport consultant's data to account for the potential 1 dB increase expected once the development is complete.
- 6.7 In order to determine at what point the site may start to benefit from using open windows to support the ventilation strategy, we have generated a computer model of the site. This allows us to consider the impact of sound from the road to the development. It is worth noting that due to the way in which sound sums it is important to ensure noise levels from the Langley Common Road are not considered in isolation. We have therefore ensured that our recommendations considered the potential for summed noise levels to ensure a robust assessment of noise break in.
- 6.8 Ground conditions have been considered as acoustically soft and 4 orders of reflections have been used. The indicative building layout has been considered in this assessment.
- 6.9 The day and night-time sound propagation from the surrounding roads are shown in Figures 6.1, 6.2 and 6.3 respectively.
- 6.10 Figure 6.4 shows the areas where acoustic mitigation is required.

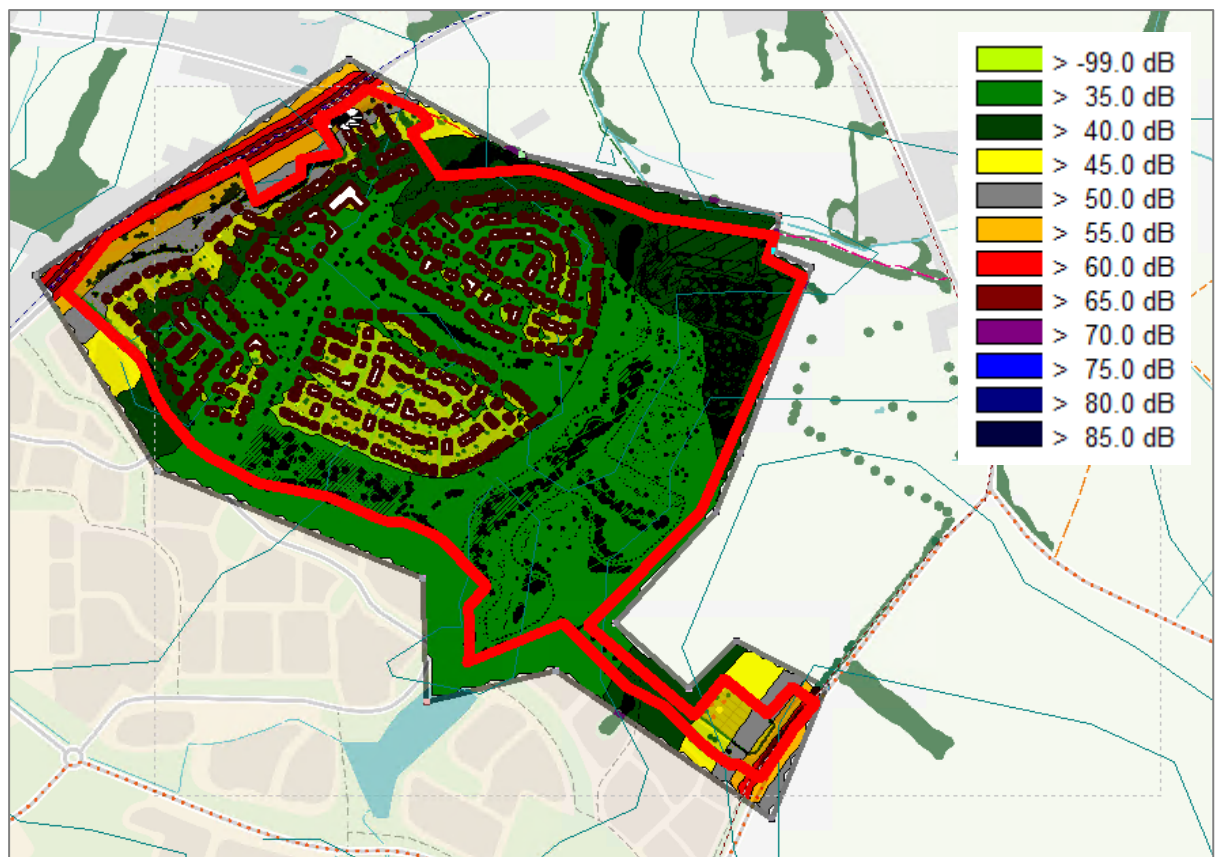


Figure 6.1: Daytime Sound Propagation

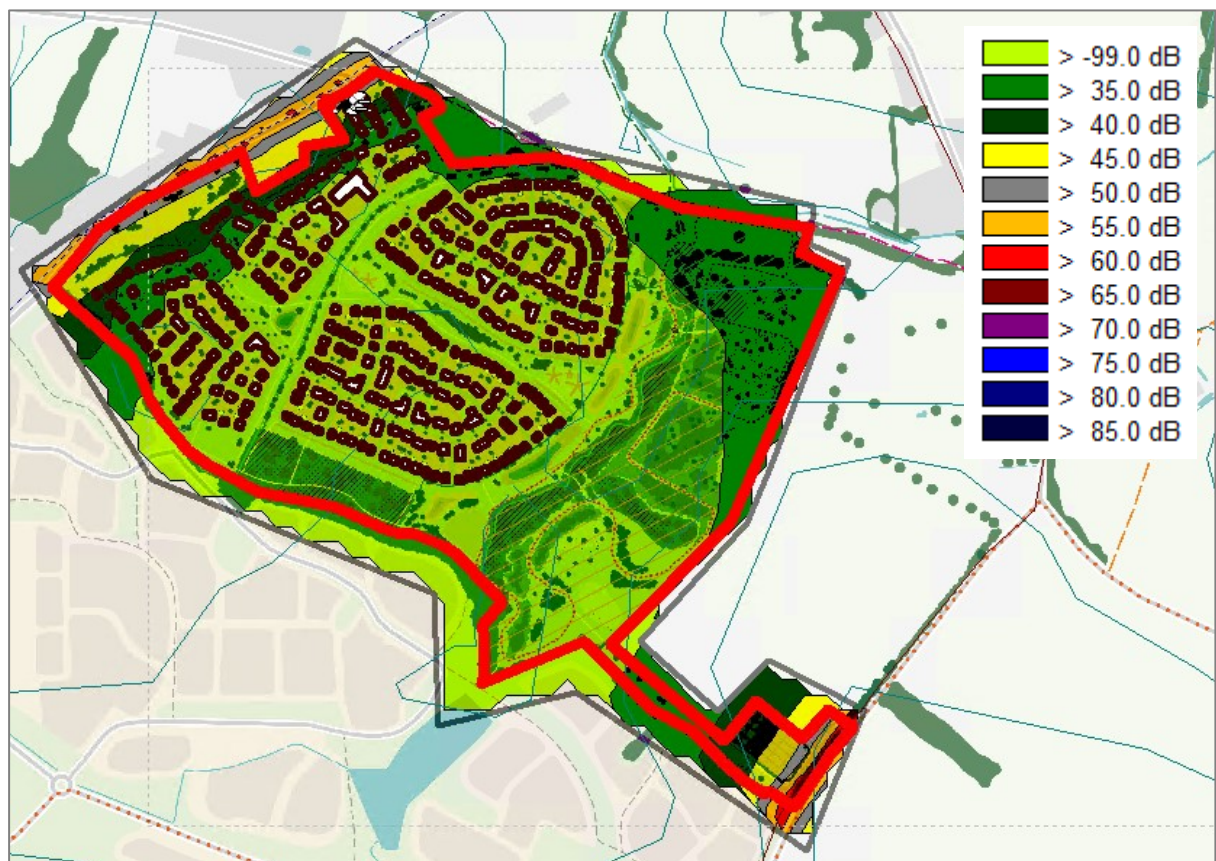


Figure 6.2: Night-time Ambient Sound Propagation

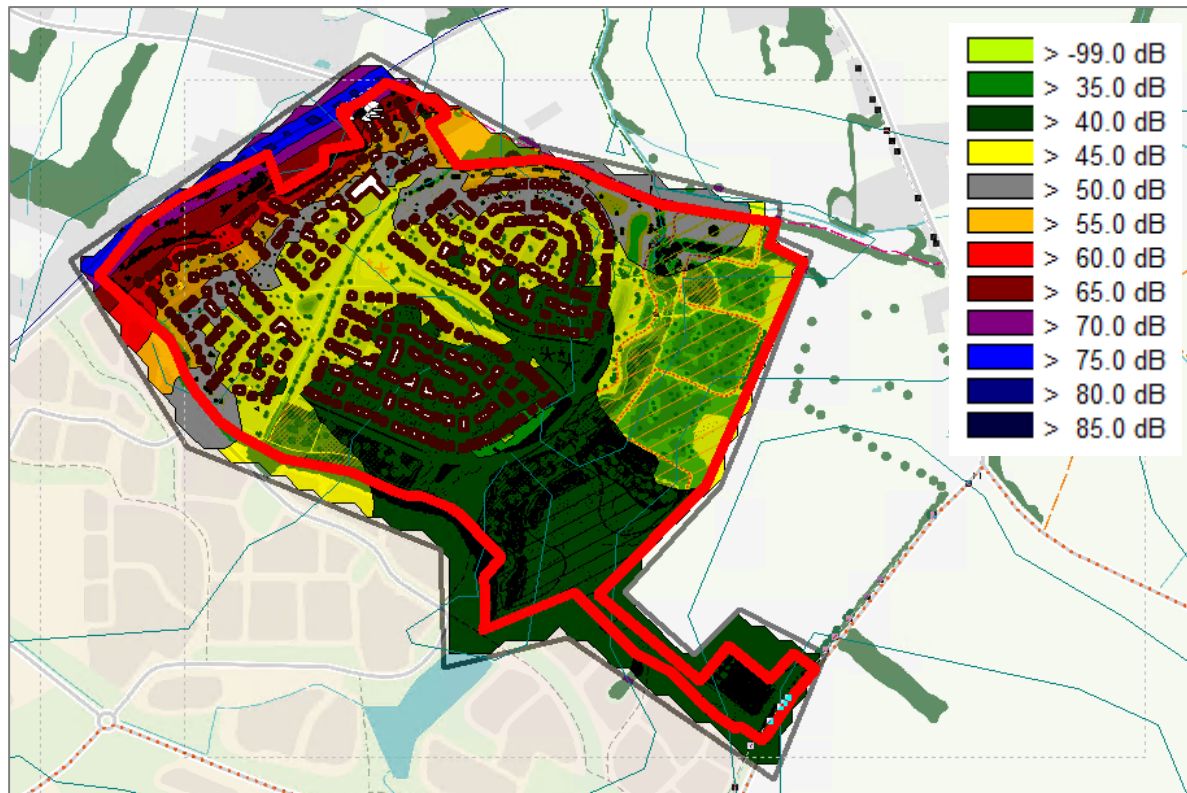


Figure 6.3: Night-time Maximum Sound Propagation



Figure 6.4: Areas Where Mitigation Is Required (Red)

- 6.11 Based on our model, the areas of the site shown in red in Figure 6.4 would require consideration to mitigation in order to allow openable windows to support the background ventilation strategy.
- 6.12 Within these areas, it is recommended that the proposed dwellings are situated so that their external amenity spaces are behind the building structures, and where practicable, sensitive rooms, such as bedrooms should not face the roads. This would satisfy the existing local policies as well as the parts 3a and 3b of Policy HC8 of the Local Plan Update 2023-2040 Proposed Submission Plan.

- 6.13 If, when developing the layouts, it is not feasible to orientate the internal layouts, then physical mitigation measures would be required in these red areas. Within these red areas, the ventilation strategy should not rely on openable windows to support the background ventilation and will require acoustically rated glazing and, if applicable, ventilation elements.
- 6.14 As the plans are outline at this stage, calculations have assumed houses will not be positioned closer than 10 metres from the curb side of Langley Common Road. Houses closer than this will require a separate assessment of impact once a detailed site layout has been provided.
- 6.15 It should be noted that windows need not be sealed shut and can be opened at the discretion of the occupants.
- 6.16 We have based our calculations on relatively small rooms with dimensions of 4 m by 3 m by 2.5 m, with each room having at least 2 m² of glazing.
- 6.17 Properties shown in red in figure 6.4 should have glazing capable of achieving at least 31 dB R_w and a ventilation elements with a combined normalised level difference of 37 dB D_{n,e,w}.
- 6.18 For our calculations we have used data for Pilkington standard double-glazed units comprising 4 mm glass – 12 mm airgap – 4 mm glass and two Titon SFX 2500EA trickle vents with V75/standard canopies capable of achieving 40 dB D_{n,e,w} each.
- 6.19 Where multiple trickle vents are used each one should achieve a normalised level difference of 37 dB D_{n,e,w} + 10 x log (N), where N is the number of units in the space.
- 6.20 Alternative products should be reviewed on a case-by-case basis as, in addition to the single figure rating, it is important to ensure that sufficient mitigation can be provided across the frequency range.
- 6.21 With the proposed mitigation measures the following internal noise levels are calculated in the worst affected property.

Period of assessment	Parameter	Calculated internal noise level	Meets design criteria
Daytime	Ambient	32 dB L _{Aeq, 16-hour}	Yes
Night-time	Ambient	23 dB L _{Aeq, 8-hour}	Yes
	Maximum	45 dB L _{Afmax}	Yes

Table 6.1: Calculated Internal Noise Levels

- 6.22 It can be seen with the proposed mitigation; reasonable internal sound levels can be achieved in the worst effected location.
- 6.23 We would expect much of the development to benefit from lower sound levels if the above recommendations are implemented, which would satisfy 3c of the proposed plan.
- 6.24 For the benefit of the reader it should be noted that optimising site layout and reducing the number of habitable rooms facing towards the Langley Common Road would constitute good acoustic design practice and should be the priority for the properties within the red zones.
- 6.25 We would recommend that a detailed review is undertaken once the site layout is finalised.

Assessment of Plant Noise

- 6.26 Where commercial units are included in this development, any plant associated with the units will require assessment and mitigation to minimise impact where an adverse impact is found to occur.
- 6.27 It is also likely that an assessment of noise from any mechanical plant proposed as part of the residential development and care home, for example air source heat pumps or MVHR units will need to be assessed.
- 6.28 It will be for the Council to confirm suitable limits in keeping with local policy.
- 6.29 BS 4142 states that where commercial plant noise rating levels are 5 dB above the local background noise levels this may indicate that an adverse impact may start to begin.
- 6.30 In our opinion controlling plant noise levels so that they do not exceed 45 dB $L_{A,T,r}$ during the daytime and 33 dB $L_{A,T,r}$ during the night-time at the closest noise sensitive receptors, when assessed in accordance with BS 4142, would result in reasonable acoustic conditions across the site.
- 6.31 It should be noted however that the guidance in MCS 020 or other guidance specific to the Local Planning Authority may be used when assessing impact of air source heat pumps approved by the scheme, when considered permitted development.
- 6.32 Again, we would expect the Council to confirm suitable criteria based on the recommendations and evidence provided in this report.

External Noise Levels

- 6.33 The measurements undertaken for this project demonstrate that external noise levels across the majority of the site are below the lower limit proposed in the WHO guidance and in BS 8233.
- 6.34 Langley Common Road was identified as the primary noise source impacting the site. Levels from Langley Common Road across the site are shown in Figure 6.1.
- 6.35 A close up view of the area's most significantly impacted by Langley Common Road are shown in Figure 6.5.

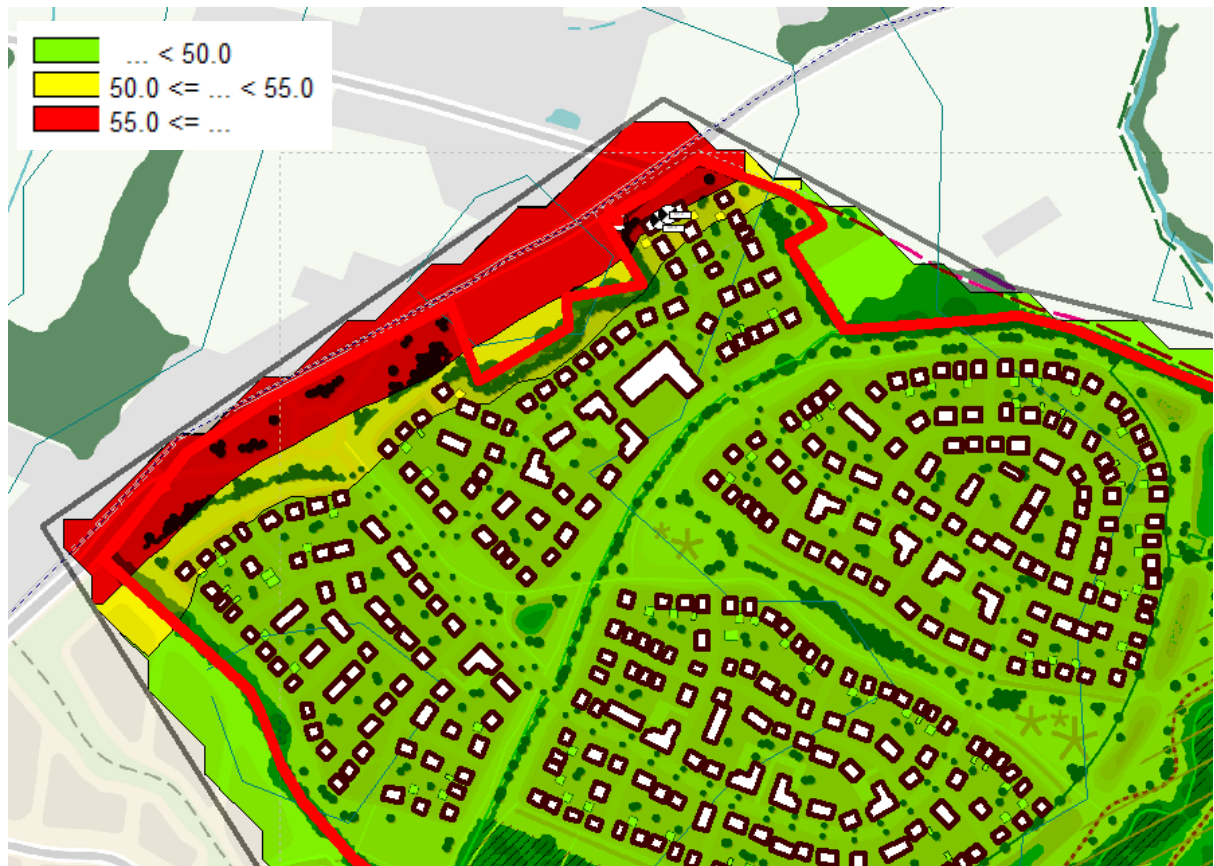


Figure 6.5: External Noise Levels

- 6.36 Areas in green are below the lower limits proposed in the WHO guidelines and BS 8233 for external amenity.
- 6.37 Areas in yellow are above the lower limits, but below the upper limits proposed in the WHO guidelines and BS 8233 for external amenity.
- 6.38 Areas in red are above the upper limits proposed in the WHO guidelines and BS 8233 for external amenity.
- 6.39 Initial layouts provided by the design team show two plots in the red zone.
- 6.40 Our calculations show that where dwellings are located in this zone, we would recommend that the buildings themselves are used to shield the gardens. Should this not be feasible, then the gardens should have 1.8 metre close boarded fences to reduce the noise levels from the road. Fences should be impermeable, and meet a mass per unit of at least 10 kg/m². This can normally be achieved with a 20 mm solid timber fence. A detailed review of the final proposed layouts can be undertaken once the detailed design is progressed.

7.0 OUTLINE CONSTRUCTION NOISE ASSESSMENT

- 7.1 This section contains an outline assessment of construction noise associated with the proposed development.
- 7.2 We have used the guidance contained in BS 5228-1 as the basis of this assessment.
- 7.3 Noise levels across the site are shown to be relatively low, and we therefore consider the site to fall within the Category A Threshold.
- 7.4 This assessment has considered the existing ambient noise levels and the likely significant effects on existing receptors around the site and surrounding area in terms of:
- existing baseline conditions.
 - noise impacts expected during construction.
- 7.5 The potential effects of vibration have not been considered within this assessment, as it is anticipated that major vibratory works, if any, will not take place within a distance that is likely to cause nuisance or damage to nearby residents. Once site layouts have been confirmed and construction RAMS have been produced, a detailed assessment should be undertaken to confirm the impact of noise and vibration on the nearby areas.
- 7.6 The site is currently undeveloped land, with no existing structures. Therefore, it is anticipated that there will be little demolition and site preparation works undertaken prior to construction works commencing. The following figure indicates the representative construction source and noise sensitive receptor locations used in the subsequent assessment.

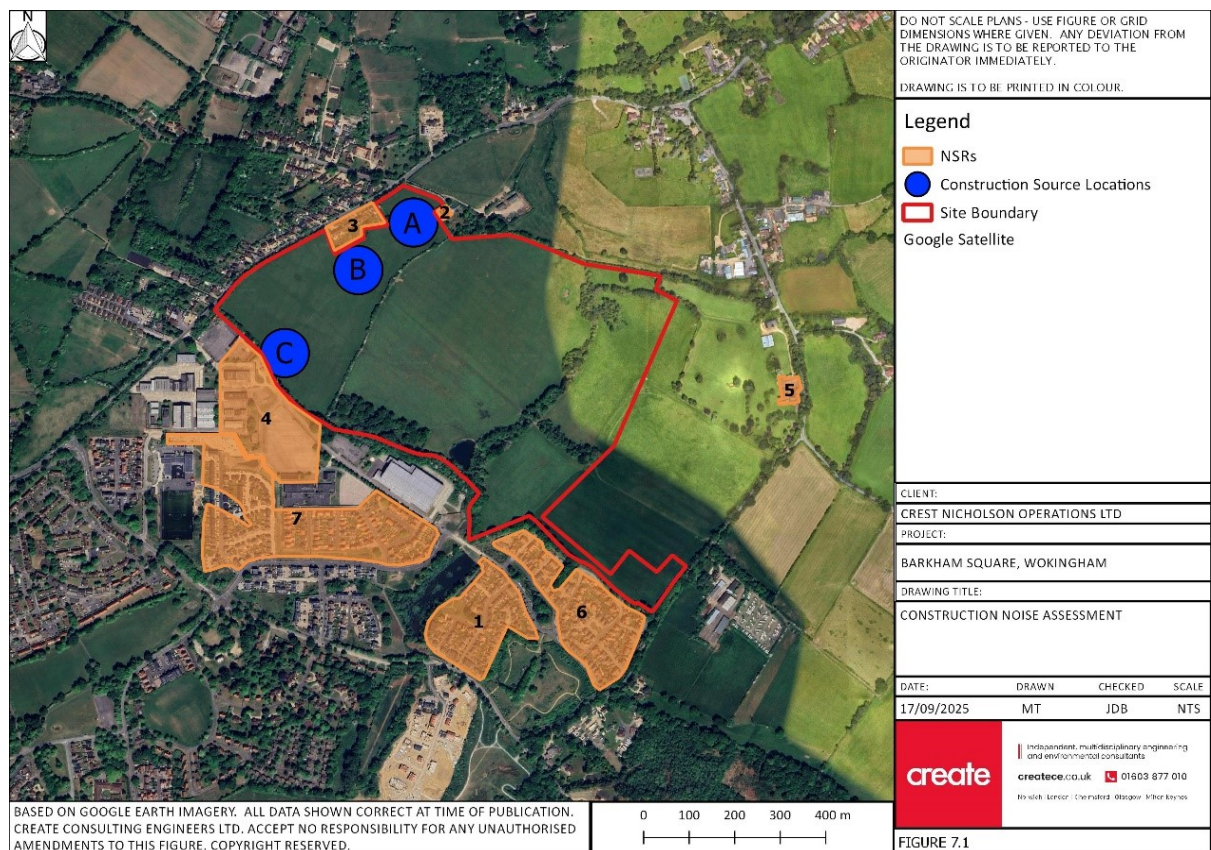


Figure 7.1: Representative Construction Noise Source and NSR Locations

- 7.7 In the absence of a site-specific Method Statement (MS), prior experience on similar projects has been used to inform the selection of likely plant and machinery that will be used.
- 7.8 The processes and details as described within this report have been deemed as representative and reflect the processes that could be used on this project. Should the supplied method statement differ, then further analysis to reflect any changes would be required.
- 7.9 The following Tables show the indicative impact of each assessment location to the closest surrounding receptors without mitigation.

BS 5228-1 Calculation Method	Location A			Category Threshold (dB): 65			
Equipment Type	dB at 10m	Number of Units	Percent on Time	dB Result at 10m	NSR 2	NSR 3	NSR 4
					45 mtrs	70 mtrs	400 mtrs
13-ton excavator	70	5	30%	72	59	55	40
8-ton excavator	68	3	30%	68	54	51	36
6-ton dumper	79	2	50%	79	66	62	47
Compressor	65	5	15%	64	51	47	32
Dump Truck (Empty)	87	2	25%	84	71	67	52
Dump Truck (Tipping Fill)	79	2	25%	76	63	59	44
Rollers	74	1	20%	67	54	50	35
Concrete Pump	75	1	50%	72	59	55	40
Cumulative dB Sum at NSR					73	69	54

Table 7.1: Construction Noise From Locations A ($L_{Aeq,T}$ dB)

BS 5228-1 Calculation Method	Location B			Category Threshold (dB): 65			
Equipment Type	dB at 10m	Number of Units	Percent on Time	dB Result at 10m	NSR 2	NSR 3	NSR 4
					190 mtrs	45 mtrs	330 mtrs
13-ton excavator	70	5	30%	72	46	59	41
8-ton excavator	68	3	30%	68	42	54	37
6-ton dumper	79	2	50%	79	53	66	49
Compressor	65	5	15%	64	38	51	33
Dump Truck (Empty)	87	2	25%	84	58	71	54
Dump Truck (Tipping Fill)	79	2	25%	76	50	63	46
Rollers	74	1	20%	67	41	54	37
Concrete Pump	75	1	50%	72	46	59	42
Cumulative dB Sum at NSR					60	73	56

Table 7.2: Construction Noise From Locations B ($L_{Aeq,T}$ dB)

BS 5228-1 Calculation Method	Location C			Category Threshold (dB): 65			
Equipment Type	dB at 10m	Number of Units	Percent on Time	dB Result at 10m	NSR 2	NSR 3	NSR 4
					450 mtrs	250 mtrs	45 mtrs
13-ton excavator	70	5	30%	72	39	44	59
8-ton excavator	68	3	30%	68	34	40	54
6-ton dumper	79	2	50%	79	46	51	66
Compressor	65	5	15%	64	31	36	51
Dump Truck (Empty)	87	2	25%	84	51	56	71
Dump Truck (Tipping Fill)	79	2	25%	76	43	48	63
Rollers	74	1	20%	67	34	39	54
Concrete Pump	75	1	50%	72	39	44	59
Cumulative dB Sum at NSR					53	58	73

Table 7.3: Construction Noise From Locations C ($L_{Aeq,T}$ dB)

- 7.10 As can be seen from the above tables, without mitigation the ABC threshold level is likely to be exceeded at several locations. The use of site hoarding can provide up to 9 dB of sound reduction to ground floor receptors when close to the noise source. However, barriers lose effectiveness the greater the source is from the barrier.
- 7.11 Additional mitigation methods are simple and effective to use, ranging from the use of mufflers, additional near field screening and enclosures. The efficacy of a selection of enclosures are highlighted in Table B.1 of BS 5228-1:2009 + A1:2014. For this assessment we have only assumed the use of the mitigative methods within the red section shown in the following Tables. The effect of site hoarding has not been considered in this assessment.

BS 5228-1 Calculation Method	Location A					Category Threshold (dB): 65			
Equipment Type	dB at 10m	Number of Units	Source Mitigation	dB Reduction	Percent on Time	dB Result at 10m	NSR 2	NSR 3	NSR 4
							45	70	400
13-ton excavator	70	5	Exhaust Muffler	10	30%	62	49	45	30
8-ton excavator	68	3	Exhaust Muffler	10	30%	58	44	41	26
6-ton dumper	79	2	Exhaust Muffler	10	50%	69	56	52	37
Compressor	65	5	Enclosure	20	15%	44	31	27	12
Dump Truck (Empty)	87	2	Exhaust Muffler	15	25%	69	56	52	37
Dump Truck (Tipping Fill)	79	2	Exhaust Muffler	10	25%	66	53	49	34
Rollers	74	1	Exhaust Muffler	20	20%	47	34	30	15
Concrete Pump	75	1	Enclosure	20	50%	52	39	35	20
Cumulative dB Sum at NSR							60	56	41

Table 7.4: Construction Noise From Locations A With Mitigation ($L_{Aeq,T}$ dB)

BS 5228-1 Calculation Method	Location B					Category Threshold (dB): 65			
Equipment Type	dB at 10m	Number of Units	Source Mitigation	dB Reduction	Percent on Time	dB Result at 10m	NSR 2 190	NSR 3 45	NSR 4 330
13-ton excavator	70	5	Exhaust Muffler	10	30%	62	36	49	31
8-ton excavator	68	3	Exhaust Muffler	10	30%	58	32	44	27
6-ton dumper	79	2	Exhaust Muffler	10	50%	69	43	56	39
Compressor	65	5	Enclosure	20	15%	44	18	31	13
Dump Truck (Empty)	87	2	Exhaust Muffler	15	25%	69	43	56	39
Dump Truck (Tipping Fill)	79	2	Exhaust Muffler	10	25%	66	40	53	36
Rollers	74	1	Exhaust Muffler	20	20%	47	21	34	17
Concrete Pump	75	1	Enclosure	20	50%	52	26	39	22
Cumulative dB Sum at NSR							47	60	43

Table 7.5: Construction Noise From Locations B With Mitigation ($L_{Aeq,T}$ dB)

BS 5228-1 Calculation Method	Location C					Category Threshold (dB): 65			
Equipment Type	dB at 10m	Number of Units	Source Mitigation	dB Reduction	Percent on Time	dB Result at 10m	NSR 2 450	NSR 3 250	NSR 4 45
13-ton excavator	70	5	Exhaust Muffler	10	30%	62	29	34	49
8-ton excavator	68	3	Exhaust Muffler	10	30%	58	24	30	44
6-ton dumper	79	2	Exhaust Muffler	10	50%	69	36	41	56
Compressor	65	5	Enclosure	20	15%	44	11	16	31
Dump Truck (Empty)	87	2	Exhaust Muffler	15	25%	69	36	41	56
Dump Truck (Tipping Fill)	79	2	Exhaust Muffler	10	25%	66	33	38	53
Rollers	74	1	Exhaust Muffler	20	20%	47	14	19	34
Concrete Pump	75	1	Enclosure	20	50%	52	19	24	39
Cumulative dB Sum at NSR							40	45	60

Table 7.6: Construction Noise From Locations C With Mitigation ($L_{Aeq,T}$ dB)

- 7.12 It can be seen that at all locations the sound level has been reduced so that the noise sensitive receptors experience acceptable sound levels following the implementation of the mitigative measures proposed.
- 7.13 This assessment is based on the closest working proximities to the receptors and therefore represents a worst case impact. Ensuring that the mitigation proposed is used across the entire development should ensure that the threshold is not exceeded throughout the works.
- 7.14 Despite the prediction of compliance with the Category A Criteria, it is crucial that 'Best Practicable Means' are adopted to keep annoyances to a minimum and a clear line of communication between the developer and nearby occupants is essential to keep relations amicable.
- 7.15 In addition to these methods, the most effective means of mitigation is to control the noise at source. This can be achieved in the following ways:
- Switching off plant when not in use;
 - Noise emission limits for equipment used on site;
 - Retrofitting plant and equipment with silencers and mufflers etc.;
 - Nearfield acoustic screening at areas of noisy works; and
 - Using alternative, quieter methods of working, incorporating the selection of quieter equipment/methods.

- 7.16 Additional, more generalised mitigation strategies could also include the following:
- Situate plant away from any party walls or ceilings and floors where practicable.
 - Keep a clear and open line of communication with residents in order to keep them informed of any works being undertaken that have the potential to cause a noise disturbance.
 - Keep work activities strictly within the agreed upon times.
 - Work to Best Practicable Means at all times.
- 7.17 To reduce the impact of any plant accessing the site, the following framework should be used at all times:
- Quiet working methods should be employed where reasonably practicable, such as minimising engine revving and switching off engines whilst on site being loaded/unloaded;
 - Any haulage vehicles do not leave/enter site between 18:00 and 08:00; &
 - Additional nearfield screening should be utilised along access/egress routes, where practicable.
- 7.18 At the time of the writing of this report there was no piling methodology available.
- 7.19 We recommend that should piling be required, due to the proximity of the site to nearby sensitive receptors, continuous flight auger (CFA) piling be used to minimise the likelihood of both noise and vibratory impacts on nearby receptors.
- 7.20 If used, and once a piling methodology has been produced, a full piling noise and vibration assessment should be undertaken to assess the likelihood of adverse impact and so that appropriate mitigation can be specified.

8.0 UNCERTAINTY

- 8.1 With all assessments there is a degree of uncertainty which must be considered.
- 8.2 Our assessment is based on measurements taken over the course of approximately nine days. Given the relatively small range in noise levels, we do not expect a high degree of uncertainty to be associated with these measurements.
- 8.3 Any plant proposed on the scheme is currently unknown and we would recommend a detailed assessment is undertaken to consider the potential impact of any plant associated with the scheme.
- 8.4 Equipment calibration showed low calibration drift and we do not expect uncertainty associated with this to alter the outcome of the assessment.
- 8.5 Calculations using our computer software are carried out in accordance with ISO 9613-2. The standard states that there is a ± 3 dB error associated with the calculation method. In practice the assumptions used in our calculation method tend to the worst-case assumption for propagation, and we would not expect uncertainty associated with the calculation method to alter the outcome of our assessment.
- 8.6 It should be noted that a new version of the above standard has been released in 2024. This standard addresses reduced performances of barriers that may occur over large distances. This review does not consider the impact of barriers or obstacles and we would not expect a significant degree of uncertainty to be associated with the changes to the standard. Indeed the calculations in this report are likely to tend to a worst-case assessment of impact.
- 8.7 Note that our model calibrated very well to our site measurements and we would not expect a significant degree of uncertainty to be associated with this assessment.

9.0 CONCLUSIONS

- 9.1 Create Consulting Engineers Ltd have been appointed by Crest Nicholson Operations Ltd (Chiltern Division) to undertake a noise impact assessment for a new housing development at Barkham Square, Wokingham.
- 9.2 The majority of the site is shown to be subject to relatively low noise levels and we would not expect dedicated mitigation measures to be required to avoid adverse impact.
- 9.3 Houses close to Langley Common Road will require mitigation measures to ensure suitable internal and external levels can be achieved.
- 9.4 The requirements for these areas are provided in this report.
- 9.5 We have provided guidance for the assessment of mechanical plant associated with the development. It is ultimately for the Council to propose and agree to suitable noise limits for any plant.
- 9.6 We have undertaken an indicative construction noise assessment which highlights the need for mitigation to be implemented. A detailed construction noise assessment should be undertaken once the construction method statement is available.
- 9.7 We are of the opinion that for the majority of the site, there should be no adverse impact to the existing, or proposed dwellings. Where there are areas of elevated sound levels, with the mitigation measures recommended within this report, the sound levels should reduce to a level where there should be no adverse impact to the existing, or proposed dwellings.
- 9.8 The outline proposals therefore have been shown to comply with all National and Local guidance, including the Wokingham Borough Local Plan Update: Proposed Submission Plan 2023–2040.

10.0 DISCLAIMER

- 10.1 Create Consulting Engineers Ltd disclaims any responsibility to the Client and others in respect of any matters outside the scope of this report.
- 10.2 The copyright of this report is vested in Create Consulting Engineers Ltd and Crest Nicholson Operations Ltd (Chiltern Division). The Client, or his appointed representatives, may copy the report for purposes in connection with the development described herein. It shall not be copied by any other party or used for any other purposes without the written consent of Create Consulting Engineers Ltd or Crest Nicholson Operations Ltd (Chiltern Division).
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APPENDIX A

Acoustic Glossary

dB(A)

The human ear is less sensitive to low (below 125Hz) and high (above 16kHz) frequency sounds. A sound level meter can be used to duplicate the ear's variable sensitivity to sound across a spectrum of frequencies. This is achieved by building a filter into the instrument with a similar frequency response to that of the average ear. This is called an "A-weighting filter". Measurements of sound made with this filter are called A-weighted sound level measurements and the unit is dB(A).

$L_{eq,T}$

The sound from noise sources often fluctuates widely during a given period of time. An average value can be measured, the equivalent sound pressure level L_{eq} . The L_{eq} is the equivalent sound level which would deliver the same sound energy as the actual fluctuating sound measured in the same time period (T).

$L_{10,T}$

This is the minimum level exceeded for not more than 10% of the time period (T). This parameter is often used as a "not to exceed" criterion for noise.

$L_{90,T}$

This is the minimum level exceeded for not more than 90% of the time period (T). This parameter is often used as a descriptor of "background noise" for environmental impact studies.

L_{fmax}

This is the maximum sound pressure level that has been measured over a period using a fast time constant.

Octave Bands

In order to completely determine the composition of a sound it is necessary to determine the sound level at each frequency individually. Usually, values are stated in octave bands. The audible frequency region is divided into 10 such octave bands whose centre frequencies are defined in accordance with international standards.

Addition of noise from several sources

Noise from different sound sources combine, on a logarithmic scale, to produce a sound level higher than that from any individual source. Two equally intense sound sources operating together produce a sound level which is 3dB higher than one alone and 3 identical sources produce a 5dB higher sound level.

Attenuation by distance

Sound which propagates from a point source in free air attenuates by 6dB for each doubling of distance from the noise source. Sound energy from line sources (e.g. stream of cars) drops off by 3dB for each doubling of distance.

Subjective impression of noise

Sound intensity is not perceived directly at the ear; rather it is transferred by the complex hearing mechanism to the brain where acoustic sensations can be interpreted as loudness. This makes hearing perception highly individualised. Sensitivity to noise also depends on frequency content, time of occurrence, duration of sound and psychological factors such as emotion and expectations. The following table is a reasonable guide to help explain increases or decreases in sound levels for many acoustic scenarios.

Change in sound level (dB)	Change in perceived loudness
1	Imperceptible
3	Just barely perceptible
6	Clearly noticeable
10	About twice as loud
20	About 4 times as loud

Barriers

Outdoor barriers can be used to reduce environmental noises, such as traffic noise. The effectiveness of barriers is dependent on factors such as its distance from the noise source and the receiver, its height and its construction.

Reverberation control

When sound falls on the surfaces of a room, part of its energy is absorbed and part is reflected back into the room. The amount of reflected sound defines the reverberation of a room, a characteristic that is critical for spaces of different uses as it can affect the quality of audio signals such as speech or music. Excess reverberation in a room can be controlled by the effective use of sound-absorbing treatment on the surfaces, such as fibrous ceiling boards, curtains and carpets.

IANL

IANL or 'Internal Ambient Noise Level' refers to the recorded (or predicted) $L_{Aeq,T}$ within a dwelling, office, commercial unit or treatment space. IANL typically defines a design limit or range.

APPENDIX B

Summary of National Policy

National Planning Policy

National Planning Policy Framework (December 2023)

The National Planning Policy Framework (NPPF) replaces the previous version of the NPPF and the Planning Policy Statements (PPS) and Planning Policy Guidance (PPG), including the Department of the Environment's Planning Policy Guidance Note 24: 'Planning and Noise' (PPG 24), which was published in 1994. The main reference to noise within the latest version of the NPPF is at Paragraphs 180 (e) and 191:

'Para.180 (e). "Planning policies and decisions should contribute to and enhance the natural and local environment by:

(e) 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."

'Para.191. 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:

- (a) 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 life⁹⁵;*
- (b) 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*
- (c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.'*

The reference number 95 cross references the National Policy Statement for England (2010) Explanatory Note.

Although some qualitative guidance on noise has been provided in the web-based Planning Practice Guidance document, there has been no alternative quantitative guidance proposed by the Government as a direct replacement for PPG24. This was due to the recognition that every site is different and that there is no single acceptable noise level, suitable for all applications.

National Planning Policy Guidance (2019)

On 6th March 2014, the Department for Communities and Local Government (DCLG) launched the National Planning Practice Guidance (NPPG) web-based resource to supersede previous planning guidance documents including PPG24 and provide clarification over all disciplinary sectors in the delivery of the design quality aspirations of the NPPF. This has been updated in July 2019.

The NPPG-Noise provides guidance on the assessment of noise, the needs to be considered when new developments may create additional noise and when developments would be sensitive to the prevailing acoustic environment.

The acoustic environment should be taken into account in the planning of new development and decision making should take the following into consideration:

- *'whether or not significant adverse effect is occurring or likely to occur;*
- *whether or not an adverse effect is occurring or likely to occur; and*
- *whether or not a good standard of amenity can be achieved.'*

It then cross-references the Noise Policy Statement for England (2010) for further clarification on how to assess the overall effect of noise exposure.

The Noise Policy Statement for England (2010)

The Noise Policy Statement for England (NPSE) was published in March 2010 and is the overarching statement of noise policy for England and applies to all forms of noise other than occupational noise, setting out the long-term vision of Government noise policy which is 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.'

The vision is supported by the following aims which are reflected in paragraph 1.7 of the Noise Policy Statement for England:

'Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- *Avoid significant adverse impacts on health and quality of life;*
- *Mitigate and minimise adverse impacts on health and quality of life; and*
- *Where possible, contribute to the improvement of health and quality of life.'*

The Explanatory Note to the NPSE introduces three concepts to the assessment of the potential effects of noise:

- **NOEL** – No Observed Effect Level: *This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.*
- **LOAEL** – Lowest Observed Adverse Effect Level: *This is the level above which adverse effects on health and quality of life can be detected.*
- **SOAEL** – Significant Observed Adverse Effect Level: *This is the level above which significant adverse effects on health and quality of life occur.'*

Unlike the now redundant PPG24, the three levels are not defined numerically in the NPSE, and for the SOAEL the NPSE makes it clear that the noise level is likely to vary depending upon the noise source, the receptor and the time of day/day of the week, etc. The need for more research to investigate what may represent a SOAEL for noise is acknowledged and the NPSE asserts that not stating specific SOAEL levels provides policy flexibility in the period until there is further evidence and guidance.

APPENDIX C

Measurement Equipment

Equipment No.	Equipment	Make/Model	Certification			
32 (MP2)	Class 1 Sound Level Meter	Norsonic 140 RTA	Serial Number			
			1406932			
			Cert No.			
			1146505			
			Calibration Date			
			22/06/2023			
			Preamplifier	Norsonic 1209	Serial Number	
					1209.21140	
	Cert No.					
	1146505					
			Calibration Date			
			23/06/2023			
			Microphone	Norsonic 1225	Serial Number	
					1225.285513	
	Cert No.					
	1146505					
		Calibration Date				
		23/06/2023				
	Calibrated Level Before:	113.9 dB @ 1 kHz	Sens	-26.0		
	Calibrated Level After:	113.9 dB @ 1 kHz	Sens	-26.0		

Equipment No.	Equipment	Make/Model	Certification	
33 (MPI)	Class 1 Sound Level Meter	Norsonic 140 RTA	Serial Number	
			1406933	
			Cert No.	
			114506	
	Preamplifier	Norsonic 1209	Calibration Date	
			23/06/2023	
			Serial Number	
			1209.21141	
	Microphone	Norsonic 1225	Cert No.	
			114506	
			Calibration Date	
			23/06/2023	
			Serial Number	
			1225.285519	
Cert No.				
114506				
Calibration Date				
23/06/2023				
Calibrated Level Before:		113.9 dB @ 1 kHz	Sens	-25.5
Calibrated Level After:		113.7 dB @ 1 kHz	Sens	-25.5

Equipment No.	Equipment	Make/Model	Certification
1	Acoustic Calibrator	Norsonic 1251	Serial Number
			125134963
			Cert No.
			1164831
			Calibration Date
			08/07/2024

Person in charge of measurement: Jody Blacklock MIOA
Sam Ward MIOA

Other people present: -

Measurement parameters: L_{eq} (1/3rd octave), L_{F90} (1/3rd octave), L_{Fmax} (1/3rd octave), L_{Aeq} , L_{AF90} and L_{AFmax}

Crest Nicholson Operations Ltd (Chiltern Division)

BARKHAM SQUARE, WOKINGHAM

Acoustic Assessment

The information contained within this report and any appendices or supporting information provided are to be treated as confidential.



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