

## Chiswell Green, AL2 3AR

### Outline planning noise assessment for a proposed residential development

**Report ref.**

AP1714/21366/0

**Issued to**

McPartland Planning Limited

**Prepared by**

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## 1. INTRODUCTION

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McPartland Planning Limited are involved in a proposed development comprising 330 new homes on land north of Chiswell Green Lane, St Albans, for which an outline planning application is to be made.

Accordingly, McPartland Planning Limited has instructed Spectrum Acoustic Consultants to carry out a noise assessment for the proposed development to support the application.

## 2. SITE DESCRIPTION

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The proposal involves the construction of 330 new residential dwellings on land north of Chiswell Green Lane and west of The Croft in Chiswell Green, St Albans.

The site is bounded to the west, north, and east by footpaths with open space beyond. To the east there are existing residential uses around 70m from the site boundary.

Bounding the site to the south is Chiswell Green Lane with a mix of residential and commercial uses with open space beyond.

The main road traffic noise sources affecting the site are the A414, 700m to the north, the M1, 1.25km to the west, the M25, 1.35km to the south, and the North Orbital Road, 800m to the south east. Additionally, there will be contributions from occasional traffic movements on less trafficked local roads such as Chiswell Green Lane to the south and Watford Road to the east.

A site layout plan is presented in Appendix A.

## 3. RELEVANT GUIDANCE

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### 3.1 NATIONAL PLANNING POLICY FRAMEWORK (NPPF)

The National Planning Policy Framework (NPPF)<sup>1</sup> sets out the Government's planning policies for England and how these should be applied by establishing a framework within which locally prepared plans for development can be produced.

The NPPF requires (174) that '*planning policies and decisions should contribute to and enhance the natural and local environment by: [...] preventing new and existing development from contribution to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of [...] noise pollution [...].*'

In relation to noise (185) '*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:*

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<sup>1</sup> National Planning Policy Framework, MHCLG, July 2021

*'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 life<sup>2</sup>;*

*'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'*

Planning policies and decisions should also (187) *'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'.*

Throughout the NPPF reference is made to other policies, such as the Noise Policy Statement for England (NPSE), which should also be applied as appropriate.

### **3.2 NOISE POLICY STATEMENT FOR ENGLAND (NPSE)**

The Noise Policy Statement for England (NPSE)<sup>3</sup> sets 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 aims of the NPSE are to (2.23-2.25):

- 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

These aims are developed by reference (2.20-2.21) to the concepts of:

- NOEL (No Observed Effect Level). This is the level below which no effect can be detected.
- 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.

It recognises that there is no universally applicable objective threshold for these concepts. Consequently, the NOEL, LOAEL and SOAEL are likely to be different for different noise sources and receptors and at different times (2.22).

Situations of significant adverse effect (SOAEL) should be avoided (2.23). Where the impact is between LOAEL and SOAEL reasonable steps should be taken to minimise and mitigate adverse effects on health

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<sup>2</sup> See Explanatory Note to the Noise Policy Statement for England, paragraphs 2.23 and 2.24 , DEFRA, 15 March 2010.

<sup>3</sup> Noise Policy Statement for England (NPSE), DEFRA, 15 March 2010

and quality of life, but does not mean that such adverse effects cannot occur (2.24). It is also implied that situations of NOEL would be acceptable in noise terms.

### 3.3 PLANNING PRACTICE GUIDANCE

In March, 2014, Planning Practice Guidance on Noise<sup>4</sup> (PPG-N) was released. This provides advice on *'how planning can manage potential noise impacts in new development'*.

It confirms that neither the NPSE<sup>5</sup> nor the NPPF<sup>6</sup> *'expects noise to be considered in isolation, separately from the economic, social and other environmental dimensions of proposed development'* (002).

It also details the hierarchy of noise exposure, including the thresholds LOAEL and SOAEL, based on the likely average response, referred to within NPSE<sup>7</sup>. The noise exposure categories are summarised below.

- No Observed Adverse Effect: noise can be heard but does not cause any change in behaviour or attitude.
- Observed Adverse Effect: noise can be heard and causes small changes in behaviour and/or attitude.
- Significant Observed Adverse Effect: noise causes a material change in behaviour and/or attitude.
- Unacceptable Adverse Effect: extensive and regular changes in behaviour and/or inability to mitigate effect of noise leading to psychological stress or psychological effects.

The guidance advises, in accordance with the first and second aims of the NPSE, that where there is no observed effect or no observed adverse effect, no specific measures are required to manage the acoustic environment; where there is an observed adverse effect, consideration needs to be given to mitigating and minimising those effects; where there is significant adverse effects, the planning process should be used to avoid these effects occurring; where there are unacceptable adverse effects, the situation should be prevented.

In establishing values for LOAELs and SOAELs which represent the onset levels of adverse effects and significant adverse effects respectively, the guidance advises because of the subjective nature of noise, there is no simple relationship between noise level and its impact. It will instead depend on a number of factors in a particular situation. These will include:

- *'The source, its absolute level and the time of day.*
- *For intermittent sources, the number and duration of events;*
- *The spectral frequency content of the noise*

*And also other factors will need to be considered in many cases, which are more fully described and detailed within the full PPG guidance, but include matters such as:*

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<sup>4</sup> PPG - Noise, MHCLG, 6 March 2014

<sup>5</sup> Explanatory Note to the Noise Policy Statement for England, paragraphs 2.23 and 2.24, DEFRA, 15 March 2010)

<sup>6</sup> National Planning Policy Framework, MHCLG, July 2018

<sup>7</sup> Explanatory Note to the Noise Policy Statement for England, paragraphs 2.19 and 2.20, DEFRA, 15 March 2010)

- *The cumulative impacts with other sources*
- *Whether internal effects can be completely removed for example by closing windows (relevant with new residential development subject to ventilation being developed)*
- *Whether existing noise sensitive locations already experience high noise levels,*
- *Where Noise Action Plans, and, in particular Important Areas are identified nearby.*
- *The effect on fauna/wildlife especially on nationally designated sites.*
- *The use of external amenity spaces intrinsic to an overall design and including private gardens.*
- *The potential effect of a new residential or other sensitive development being located close to an existing noisy business or site, and for noise mitigation to be considered.*
- *Whether there are nearby areas of tranquility relatively undisturbed by noise from human caused sources that undermine the intrinsic character of the area and likely already valued for their tranquility.'*

It should be observed that the PPG guidance does not provide any detail on the how such assessment including these factors, should be carried out. Reference is generally therefore made to existing British Standards where possible and also to scientific exposure-response studies or reviews relating to noise and its health and other effects on human and, where appropriate, animal populations. In such circumstances, some justification may be necessary when using this information.

### **3.4 GUIDELINES FOR COMMUNITY NOISE - WORLD HEALTH ORGANIZATION (WHO), 1999**

Guidelines for Community Noise (GCN) was published in 1999 with the aim of informing legislation and guidance produced at the national and regional levels for the purposes of minimising any potential adverse health effects resulting from noise in the community. It presents guideline noise level criteria for the avoidance of adverse effects such as sleep disturbance and annoyance in a range of specific environments. The preface to WHO states that community noise includes road, rail and air traffic, industries, construction and public work, and the neighbourhood.

New guidance from WHO titled Environmental Noise Guidelines for the European Region (ENG) was published in 2018. The document takes a very different approach to guidance set out in the previous document (GCN) by identifying separate thresholds for specific sources rather than for community noise as a whole. Consequently, much of the earlier guidance set out in GCN is now absent from ENG. While ENG was intended to supersede GCN, it recognises this absence and states that *'indoor guideline values and any values not covered by the current guidelines (such as industrial noise and shopping areas) should remain valid.'*

It is recommended that all WHO guidance should be noted but that it should not be relied upon in assessments without reference to other relevant detailed guidance, especially that in British Standards. These may align better with Planning Practice Guidance<sup>8</sup> in England.

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<sup>8</sup> PPG - Noise, MHCLG, 6 March 2014

### 3.5 BS 8233:2014 GUIDANCE ON SOUND INSULATION AND NOISE REDUCTION FOR BUILDINGS

BS 8233:2014<sup>9</sup> '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'. 'The Standard is not<sup>10</sup> intended to be used routinely where noise sources are brought to existing noise sensitive buildings'.

For residential use dwellings (7.7.1), 'the main considerations, for bedrooms, are the acoustic effect on sleep; and for other rooms, the acoustic effect on resting, listening and communicating' (7.7.1).

Internal noise criteria are advised relating to sources of external noise "without a specific character", previously termed "anonymous noise".(....). For simplicity, only noise without character is considered. Noise has a specific character if it contains features such as a distinguishable, discrete and continuous tone, is irregular enough to attract attention, or has strong low-frequency content, in which case lower noise limits might be appropriate'.(7.7.1)

'For steady external noise sources, it is desirable that the internal ambient noise level does not exceed the guideline values in' Table 1.

Activity	Location	07:00-23:00	23:00-07:00
Resting	Living room	35 dB $L_{Aeq,16\text{ hour}}$	-
Dining	Dining room/area	40 dB $L_{Aeq,16\text{ hour}}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16\text{ hour}}$	30 dB $L_{Aeq,8\text{ hour}}$

**Table 1:** 'Indoor ambient noise levels for dwellings' for 'noise without character'

There are a number of notes to the table. These include:

*Note 4: 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.*

BS 8233 does not give guidance on what might constitute a guideline value. However, as the standard does cross reference WHO, we suggest that the guideline value of  $L_{AFmax}$  45dB, inside bedrooms, should not be exceeded during the night more than 10-15 times, which reflects the WHO position.

*'Note 5: If relying on closed windows to meet the guide values, there needs to be an appropriate alternative ventilation that does not compromise the facade insulation or the resulting noise level. If applicable, any room should have adequate ventilation (e.g. trickle ventilators should be open) during assessment'.*

*'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'.*

<sup>9</sup> BS 8233:2014 Guidance on sound insulation and noise reduction for buildings

<sup>10</sup> The word 'not' is omitted from the text in the Standard. The Institute of Acoustics advised 'not' to be added following a meeting of their London Branch in March 2015.



*'For traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50 dB  $L_{Aeq,T}$ , with an upper guideline value of 55 dB  $L_{Aeq,T}$  which would be acceptable in noisier environments. However, it is also recognized that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited'.*(7.7.3.2)

### 3.6 ACOUSTICS VENTILATION AND OVERHEATING RESIDENTIAL DESIGN GUIDE (AVO)

AVO was first published in January 2020 and was produced jointly by the Association of Noise Consultants and Institute of Acoustics with the aim of assisting *'acoustics practitioners as well as all those involved in the planning, development, design and commissioning of new dwellings. It recommends an approach to acoustic assessments for new residential development that take due regard of the interdependence of provisions for acoustics, ventilation, and overheating.'* (1.4)

AVO clarifies that *'it is important to differentiate between the need to provide 'purge ventilation' as required occasionally under ADF (i.e. to remove smoke from burnt food etc.); against the provision of ventilation to help control overheating, which is not covered by The Building Regulations.'* (2.4) It also clarifies that there is no specific acoustic criterion that need be met for purge ventilation.

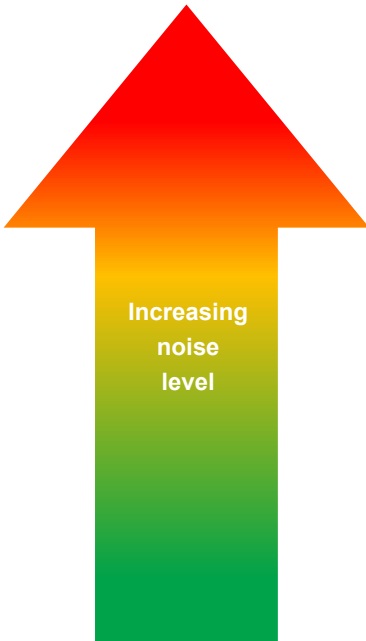
Additionally, AVO makes a clear distinction between the acoustic requirements as they relate to whole dwelling ventilation rates ('ADF ventilation condition'), which applies for the entire time, and to ventilative cooling to mitigate overheating ('overheating condition'), which applies only part of the time. It states, *'desirable internal noise standards within Table 4 of BS 8233:2014 should be achieved when providing adequate ventilation as defined by ADF whole dwelling ventilation. However, it is considered reasonable to allow higher levels of internal ambient noise from transport sources when higher rates of ventilation are required in relation to the overheating condition.'* (3.9)

Where mitigation of a potential overheating condition is to rely on opening windows, AVO advises a 'two-level noise assessment procedure'.

Level 1 is a 'Site Risk Assessment' based on a sliding scale of external noise levels from transportation noise sources, which categorises the site in terms of negligible, low, medium, or high risk of adverse effect during the overheating condition, without mitigation. The scale ranges from  $L_{Aeq,T}$  50dB/45dB (day/night) to  $L_{Aeq,T}$  65dB/55dB (day/night); however, these values are not to be taken as fixed thresholds. Where there is negligible risk, no further assessment is required. Where the risk is low or medium, a Level 2 assessment may optionally be considered. Where there is a high risk, a Level 2 assessment is recommended. Although no scale is provided for individual noise events, AVO advises that where  $L_{AFmax}$  78dB is normally exceeded at night, a Level 2 assessment is recommended.

Level 2 is an 'Assessment of Adverse Effect', which is based on a sliding scale of internal ambient noise levels from transportation noise sources relating to the overheating condition. The guidance for the Level 2 assessment is copied in Table 2. It should be noted that the values in the table should not be regarded as fixed thresholds and that the potential for adverse effect will also depend on how frequently and for what duration the overheating condition occurs.



Internal ambient noise level			Examples of Outcomes
$L_{Aeq,T}$ during 07:00-23:00	$L_{Aeq,8h}$ during 23:00-07:00	Individual noise events during 23:00-07:00	
<b>&gt; 50dB</b>	<b>&gt; 42dB</b>	<b>Normally exceeds 65dB <math>L_{AFmax}</math></b>	<p>Noise causes a material change in behaviour e.g. having to keep windows closed most of the time</p> <p>Avoiding certain activities during periods of intrusion. 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.</p> <p>At higher noise levels, more significant behavioural change is expected and may only be considered suitable if occurring for limited periods.</p> <p>As noise levels increase, small behaviour changes are expected e.g. turning up the volume on the television; speaking a little more loudly; having to close windows for certain activities, for example ones which require a high level of concentration. Potential for some reported sleep disturbance. Affects the acoustic environment inside the dwelling such that there is a perceived change in quality of life.</p> <p>Increasing likelihood of impact on reliable speech communication during the day or sleep disturbance at night</p> <p>At lower noise levels, limited behavioural change is expected unless conditions are prevalent for most of the time.</p> <p>Noise can be heard, but does not cause any change in behaviour</p>
 <p style="text-align: center;"><b>Increasing noise level</b></p>			
<b>≤ 35dB</b>	<b>≤ 30dB</b>	<b>Do not normally exceed <math>L_{AFmax}</math> 45dB more than 10 times a night</b>	

**Table 2:** Guidance for Level 2 assessment of noise from transportation noise sources relating to overheating condition (copied from AVO)



## 4. NOISE MEASUREMENT SURVEY

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### 4.1 METHODOLOGY

The ambient noise survey consisted of measuring noise levels at locations representative of the proposed sensitive facades, in order to establish the incident levels emanating from surrounding activity.

Unattended continuous measurements were carried out between 11 and 12 October 2021, during daytime and night time periods. Sample attended measurements were also made during the day and night on 11 October 2021.

The measurement locations are summarised below and shown on a plan in Appendix B.

**NML 1:** (Unattended) South west corner of site

**NML 2:** (Attended) Footpath near eastern site boundary

**NML 3:** (Attended) Footpath near northern site boundary

Noise measurement parameters consisted of equivalent continuous ( $L_{Aeq}$ ) noise levels and maximum ( $L_{Amax}$ ) noise levels as well as statistical noise levels (termed  $L_n$ , where  $n$  is the percentage of time the level is exceeded during the measurement period). Both overall and 1/1 octave band measurements were stored for later analysis.

The following equipment was used:

#### NML 1 (unattended)

- Bruel & Kjaer Type 2250 Sound Level Meter s/n 3010857
- Bruel & Kjaer Type 4189 Microphone s/n 3060877
- Bruel & Kjaer Type 4231 Acoustic Calibrator s/n 2291483

#### NML 2 and 3 (attended)

- Bruel & Kjaer Type 2250 Sound Level Meter s/n 3023840
- Bruel & Kjaer Type 4189 Microphone s/n 3130623
- Bruel & Kjaer Type 4231 Acoustic Calibrator s/n 3020229

Before and after the survey, the sound level meters were field-calibrated in accordance with the manufacturer's guidelines, and no significant drift was observed. The meter, microphone and field calibrator are laboratory calibrated biennially in accordance with UKAS procedures or to traceable National Standards.

## 4.2 RESULTS

The results of the ambient noise measurements are presented in Appendix B and summarised in Table 3.

Measurement position	Day $L_{Aeq}$ (dB)	Night $L_{Aeq}$ (dB)	Night typical $L_{Amax}$ (dB)
NML 1: South west corner of site	53	52	59
NML 2: Footpath near eastern site boundary	49	50	56
NML 3: Footpath near northern site boundary	50	48	56

**Table 3:** Summary of results of ambient noise survey results

The  $L_{Aeq}$  levels shown are the log average of all the 5-minute measurements made, which are considered representative of the 16-hour day and 8-hour night time levels, respectively. The  $L_{Amax}$  level shown for NML 1 is the 10<sup>th</sup> highest measured level of the night time period, which indicates the levels that would not be regularly exceeded (10-15 events per night as per WHO guidelines) over the period. The  $L_{Amax}$  levels shown for NML 2 and 3 are the highest measured levels taken from the sampled dataset.

Noise levels affecting the site are controlled by distance road traffic and occasional aircraft.

## 5. ASSESSMENT

### 5.1 INTERNAL NOISE WITH WINDOWS OPEN

Table 4 presents the calculation of internal ambient noise levels in the most noise exposed habitable rooms at the proposed development site. The calculation assumes a 13dB sound level reduction from outside to inside, across a partially open window.

	Day $L_{Aeq}$ (dB)	Night $L_{Aeq}$ (dB)	Night typical $L_{Amax}$ (dB)
Outside noise level, $L_{Aeq,T}$	53	52	59
Reduction through open window	-13	-13	-13
Inside noise level, $L_{Aeq,T}$	40	39	46

**Table 4:** Calculation of indoor ambient noise levels assuming open windows

It is not known at this stage what the potential for overheating is at the proposed development or whether there would be a requirement to provide mitigation in terms of ventilative cooling, such as might be achieved with open windows. An overheating assessment is beyond the scope of this report and in any case would be carried out at a later stage when the proposed plot types, orientations and layouts are known, among other detailed design factors.

However, as set out in Section 3.6, the AVO Guide provides guidance on the risk of adverse effects occurring during an overheating condition where open windows are used as mitigation. Generally, higher noise levels than those advised as being 'desirable' in BS 8233 may be acceptable, but this will depend on both the level and duration of exposure during any overheating condition. As noise levels increase, the associated noise impact would lead more quickly to an observed adverse effect, so higher levels may only be considered suitable if occurring for limited periods.



As summarised above in Table 4, with windows open, and assuming a 13dB reduction from outside to inside, internal ambient noise levels would be up to  $L_{Aeq}$  40dB during the day and  $L_{Aeq}$  39dB during the night, with  $L_{AFmax}$  events not regularly exceeding 46dB at night.

At these levels, AVO advises that during the day, only *'limited behavioural change is expected unless conditions are prevalent for most of the time'*. It is noted also that BS 8233 advises 'reasonable' internal levels during the day will be achieved at up to  $L_{Aeq}$  40dB, so this may be considered acceptable without further analysis. At night, however, *'more significant behavioural change is expected and may only be considered suitable if occurring for limited periods.'* An overheating assessment would be needed to determine the duration of any potential overheating condition, as may arise, to confirm the condition only occurs for limited periods.

## 5.2 INTERNAL NOISE WITH WINDOWS CLOSED

With standard double glazing and non-acoustic (hit and miss) trickle vents installed, noise levels in habitable rooms would typically be reduced by at least 25dB relative to incident external levels. Accordingly, Table 5 presents the calculation of internal ambient noise levels in the most noise exposed habitable rooms at the proposed development site with windows closed.

	Day $L_{Aeq}$ (dB)	Night $L_{Aeq}$ (dB)	Night typical $L_{Amax}$ (dB)
Outside noise level, $L_{Aeq,T}$	53	52	59
Reduction through closed window with trickle vents open	-25	-25	-25
Inside noise level, $L_{Aeq,T}$	28	27	34

**Table 5:** Calculation of indoor ambient noise levels assuming closed windows and open trickle vents

The results summarised in Table 5 above indicate that internal ambient noise levels would be unlikely to exceed  $L_{Aeq}$  28dB during the day and  $L_{Aeq}$  27dB during the night, with  $L_{AFmax}$  events not regularly exceeding 34dB at night. This would provide desirable internal ambient noise conditions for resting and sleeping as set out in BS 8233.

Notwithstanding the above, once the site layout and design is sufficiently developed, the acoustic requirements for glazing and ventilation should be reviewed in detail to ensure acceptable internal noise levels are achieved, as the final requirements will depend on various factors such as glazing areas, room volumes, internal layout, façade construction type, and ventilation strategy.

## 5.3 NOISE IN OUTDOOR LIVING SPACES

As set out in Section 3.5, BS 8233 suggests guidelines for noise levels in external spaces that are used for amenity space, such as gardens and patios. *"It is desirable that the external noise level does not exceed 50 dB  $L_{Aeq,T}$  with an upper guideline of 55 dB  $L_{Aeq,T}$ , which would be acceptable in noisier environments."*

The results of the noise measurement survey indicate that daytime noise levels across the site are in the range  $L_{Aeq}$  49-53dB. Accordingly, noise in external amenity areas will be acceptably low.

## 6. CONCLUSIONS

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McPartland Planning Limited are proposing a development comprising 330 new homes on land north of Chiswell Green Lane, St Albans, for which an outline planning application is to be made.

A noise survey has been completed to establish the levels incident on the site. The survey indicates that noise incident on the proposed development site is predominantly controlled by road traffic.

During the day, external ambient noise levels are sufficiently low such that 'reasonable' internal ambient noise levels will be achieved with windows open and 'desirable' levels achieved with standard double glazing closed and trickle vents open.

During the night, windows would need to be closed to achieve both the 'reasonable' and 'desirable' internal levels set out in BS 8233, for which standard double glazing and trickle vents would likely be sufficient.

Where open windows are used to mitigate overheating at night, the resulting internal noise levels would only be considered suitable where the overheating condition occurs for limited periods. The potential for overheating to arise at this development would, however, be the subject of a separate overheating assessment.

Daytime noise levels in outdoor living spaces across the site have been assessed and are considered to be acceptably low for provision of external amenity.

## **APPENDIX A**

Proposed site layout plan





Indicative Unit Key:

- 6-unit apartment block  
- 6 x 2-bed 61sqm flat
- 6-unit apartment block  
- 3 x 1-bed 50sqm flat  
- 3 x 2-bed 61sqm flat
- 1-bed dwelling - 56sqm
- 2-bed dwelling - 96sqm
- 3-bed dwelling - 114sqm

Indicative Total: **330 units**

Indicative Unit Mix: 182 x 3-bed - 55%  
116 x 2-bed - 35%  
32 x 1 -bed - 10%

Indicative Area Analysis:

Site area - 142,000sqm / 14.2ha  
Open space - 3,500sqm / 0.35ha  
Memorial park - 16,000sqm / 1.6ha  
Green buffer zone - 18,000sqm / 1.8ha

Overall percentage of green space - 26%

Indicative Proposed Site Layout - 1:2500@A3



## **A P P E N D I X B**

Measurement survey locations and results





NML 3 (attended)

NML 1 (unattended)

NML 2 (attended)

PASSWITHBASIL

Chiswell Green Livery  
Yard and Riding School

Google Earth

Imagery date: 3/24/20—newer

100 m

Camera: 1,635 m

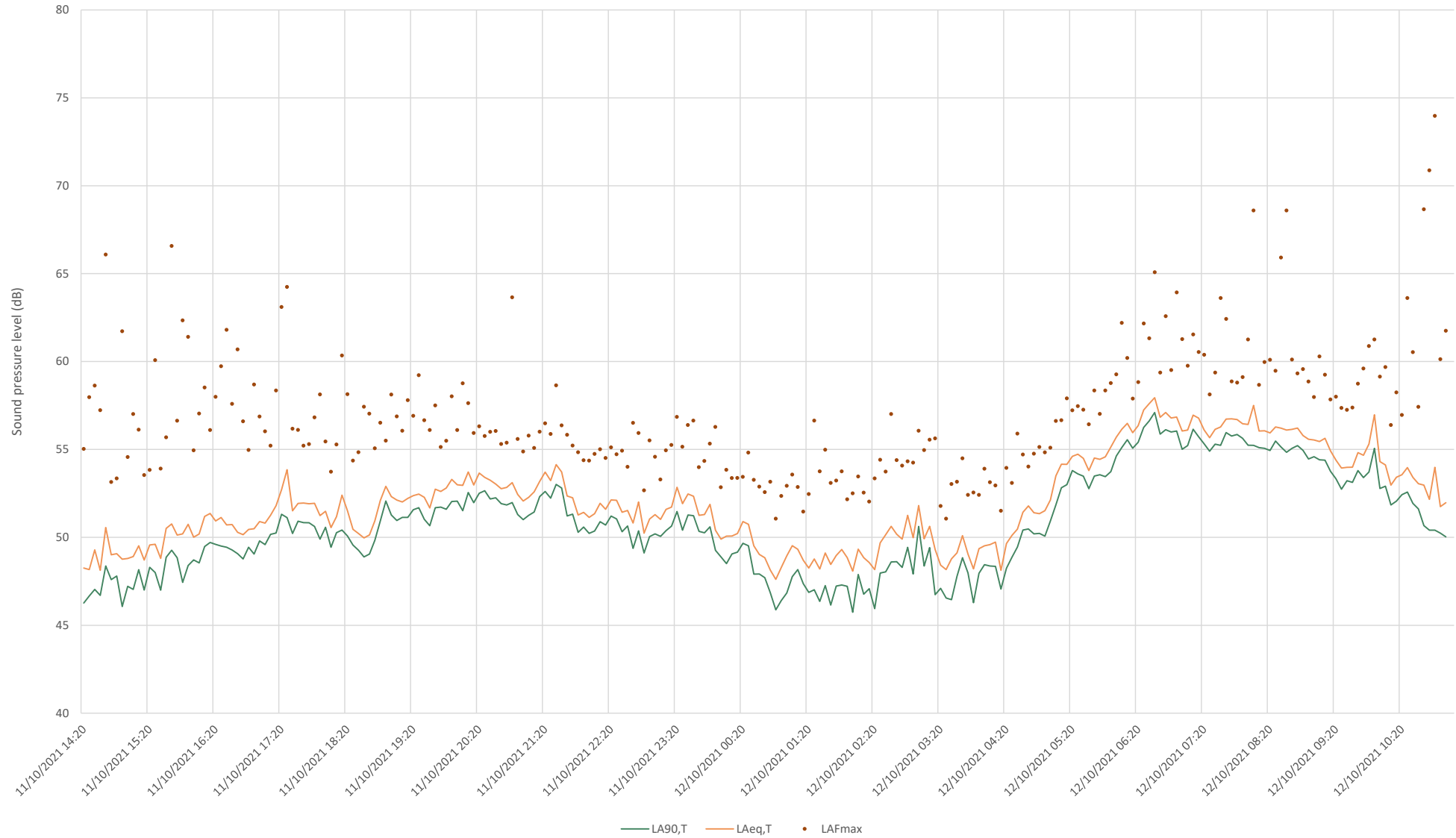
51°43'46"N 0°22'02"W

105 m

# NML 1: South west corner of site



Measured sound level (T = 5min)





## Day and night sound level totals



Project Chiswell Green, AL2 3AR  
 Project number 21366  
 Date 27/10/2021

Monitoring location NML 1: South west corner of site  
 Analysis Day and night totals

	Periods (hh:mm:ss)		LAeq		LAFmax	Leq Day 16hr								Leq Night 8hr								LFmax Night (10th highest)							
	Day	Night	Day (16hr)	Night (8hr)	Night	63	125	250	500	1k	2k	4k	8k	63	125	250	500	1k	2k	4k	8k	63	125	250	500	1k	2k	4k	8k
Highest	4:05:00	8:00:00	55	52	59	59	52	52	53	53	42	36	32	55	47	48	50	50	37	20	20	67	67	60	57	57	47	35	24
Lowest	8:45:00	8:00:00	52	52	59	56	50	48	49	50	37	24	20	55	47	48	50	50	37	20	20	67	67	60	57	57	47	35	24
Totals	12:50:00	8:00:00	53	52	59	57	51	50	51	51	39	31	28	55	47	48	50	50	37	20	20								

Date	Periods (hh:mm:ss)		LAeq		LAFmax	Leq Day 16hr								Leq Night 8hr								LFmax Night (10th highest)							
	Day	Night	Day (16hr)	Night (8hr)	10	63	125	250	500	1k	2k	4k	8k	63	125	250	500	1k	2k	4k	8k	63	125	250	500	1k	2k	4k	8k
11/10/2021	8:45:00	8:00:00	52	52	59	56	50	48	49	50	37	24	20	55	47	48	50	50	37	20	20	67	67	60	57	57	47	35	24
12/10/2021	4:05:00	0:00:00	55			59	52	52	53	53	42	36	32																

Comments:

# Environmental Noise Record Sheet



Project: Chiswell Green, AL2 3AR  
 Project number: 21366  
 Date: 13/10/2021

Noise monitoring location: 2: Footpath near eastern site boundary  
 Plant operating condition: n/a  
 Instrumentation: B&K 2250/7  
 Calibration times: 11/10/21 14:40, 17:10, 23:15; 12/10/21 01:05. No significant drift.

Date/time			Weather			Noise Level (dB)						Comments (Including description of noise (eg whine, hiss, rumble, impact, vehicle rain, vegetation, or animal noise))
Date	Start time	Duration (min:sec)	Wind speed (m/s)	Wind direction	Cloud (%)	LAF10.0	LAF50.0	LAF90.0	LAFmax	LAFmin	LAeq	
11/10/21	14:47	15:00	1-2	NW	30	49	47	46	61	44	48	Distant road traffic, plane, occasional vegetation, birds
11/10/21	15:41	15:00	1-2	NW	30	50	48	46	65	44	49	Distant road traffic, plane, occasional vegetation, birds
11/10/21	16:27	15:00	1-2	NW	50	51	50	48	59	46	50	Distant road traffic, birds
11/10/21	23:20	15:00	1-2	NW	50	53	51	50	56	48	51	Distant road traffic, plane
12/10/21	00:13	15:00	1-2	NW	50	51	49	48	55	46	49	Distant road traffic

Date/time			Weather			Leq Octave Band Pressure Level (dB)										Comments (Including description of noise (eg whine, hiss, rumble, impact, vehicle rain, vegetation, or animal noise))
Date	Start time	Duration (min:sec)	Wind speed (m/s)	Wind direction	Cloud (%)	31.5	63	125	250	500	1k	2k	4k	8k	dB(A)	
11/10/21	14:47	15:00	1-2	NW	30	57	55	48	44	45	45	35	28	25	48	Distant road traffic, plane, occasional vegetation, birds
11/10/21	15:41	15:00	1-2	NW	30	56	55	52	46	46	47	35	27	24	49	Distant road traffic, plane, occasional vegetation, birds
11/10/21	16:27	15:00	1-2	NW	50	57	54	47	41	47	48	37	25	20	50	Distant road traffic, birds
11/10/21	23:20	15:00	1-2	NW	50	55	54	48	44	50	49	36	19	17	51	Distant road traffic, plane
12/10/21	00:13	15:00	1-2	NW	50	54	53	46	42	48	47	34	18	15	49	Distant road traffic

# Environmental Noise Record Sheet



Project: Chiswell Green, AL2 3AR  
 Project number: 21366  
 Date: 13/10/2021


Noise monitoring location: 3: Footpath near northern site boundary  
 Plant operating condition: n/a  
 Instrumentation: B&K 2250/7  
 Calibration times: 11/10/21 14:40, 17:10, 23:15; 12/10/21 01:05. No significant drift.

Date/time			Weather			Noise Level (dB)						Comments (Including description of noise (eg whine, hiss, rumble, impact, vehicle rain, vegetation, or animal noise))
Date	Start time	Duration (min:sec)	Wind speed (m/s)	Wind direction	Cloud (%)	LAF10.0	LAF50.0	LAF90.0	LAFmax	LAFmin	LAeq	
11/10/21	15:19	15:00	1-2	NW	30	49	47	46	55	44	48	Distant road traffic, plane, occasional vegetation, birds
11/10/21	16:04	15:00	1-2	NW	30	51	49	48	57	46	49	Distant road traffic, plane, birds
11/10/21	16:50	15:00	1-2	NW	50	51	49	48	82	46	52	Distant road traffic, plane, birds, dog barking near microphone
11/10/21	23:49	15:00	1-2	NW	50	50	48	47	56	44	48	Distant road traffic
12/10/21	00:38	15:00	1-2	NW	50	49	47	44	54	41	47	Distant road traffic


Date/time			Weather			Leq Octave Band Pressure Level (dB)										Comments (Including description of noise (eg whine, hiss, rumble, impact, vehicle rain, vegetation, or animal noise))
Date	Start time	Duration (min:sec)	Wind speed (m/s)	Wind direction	Cloud (%)	31.5	63	125	250	500	1k	2k	4k	8k	dB(A)	
11/10/21	15:19	15:00	1-2	NW	30	57	55	47	41	45	45	35	24	20	48	Distant road traffic, plane, occasional vegetation, birds
11/10/21	16:04	15:00	1-2	NW	30	59	56	49	46	47	47	35	21	17	49	Distant road traffic, plane, birds
11/10/21	16:50	15:00	1-2	NW	50	58	55	48	44	50	50	40	25	24	52	Distant road traffic, plane, birds, dog barking near microphone
11/10/21	23:49	15:00	1-2	NW	50	57	54	44	43	47	46	33	16	14	48	Distant road traffic
12/10/21	00:38	15:00	1-2	NW	50	56	52	43	42	46	44	30	16	14	47	Distant road traffic

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