Appendix 6.1

Title	Planning Policy and Guidance		
Project	Southleigh, Havant		
Reference	2856.AP.01.00	**Author(s)**	FD
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National Policy

National Planning Policy Framework

The NPPF is the relevant document for defining the national policy toward noise sensitive development. The document was originally published in March 2012 and most recently updated in December 2024.

Paragraph 135 states that planning policies and decisions should ensure that developments:

> *"create places that […] promote health and well-being, with a high standard of amenity for existing and future users…"*

Further to this and on the subject of noise, paragraph 187 states that planning policies and decisions should contribute to and enhance the natural and local environment by:

> *"preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution"*

Paragraph 198 of the NPPF states:

> *"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 life;*
>
> *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;"*

Clause "a)" in paragraph 198 makes reference the Noise Policy Statement for England which is discussed in the following section.

The '*agent of change'* principle is discussed in paragraph 200 of the NPPF. In terms of noise, this principle requires that those proposing a new noise sensitive development incorporate sufficient mitigation such that the operation of existing premises in the area is not unreasonably restricted in order to control noise impact upon the new development:

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

Noise Policy Statement for England

The NPSE (March 2010) also does not set quantitative guidelines for the suitability of noise sensitive development in an area depending on the prevailing levels of noise. Absent, therefore, is reference to specific noise thresholds which determine whether noise sensitive development is suitable and, if so, whether mitigation factors need to be considered.

Instead, the NPSE sets out the principle of "SOAEL, LOAEL and NOEL" which are defined as follows:

Significant Observed Adverse Effect Level (SOAEL): This is the level [of noise exposure[1]] above which significant adverse effects on health and quality of life occur.

Lowest Observed Adverse Effect Level (LOAEL): This is the level [of noise exposure[2]] above which adverse effects on health and quality of life can be detected.

No Observed Effect Level (NOEL): This is the level [of noise exposure[2]] 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.

Given the overall thrust of the NPSE, the SOAEL is an important assessment threshold although the NPSE also comments in section 2.22 that:

"*It is not possible to have a single objective noise based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times.*"

Attention is drawn to the fact that the SOAEL is the level above which significant adverse effects can be observed. Importantly, it should be noted again in respect of the NPPF that the overall objective is to avoid or minimise significant adverse impacts; some degree of impact is acceptable, and it is not necessary or reasonable to seek to achieve no impact at all.

In addition to the principles set out above, the NPSE sets out three key aims:

The first aim of the Noise Policy Statement for England

"Avoid significant adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development."

The second aim of the Noise Policy Statement for England

[1] Additional text drawn from the Planning Practice Guidance Definition

"Mitigate and minimise adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development."

The third aim of the Noise Policy Statement for England

"Where possible, contribute to the improvement of health and quality of life through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development."

Paragraph 2.24 of the NPSE states that all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life. It also states that this does not mean that such adverse effects cannot occur.

Each development site must be judged on its ability to deliver on each of these aims, and while rating the prevailing noise against predefined thresholds is no longer necessary, defining the prevailing noise levels is an essential first step in assessing a given site under the current regime.

Planning Practice Guidance (PPG)

In March 2014 the Department for Communities and Local Government (DCLG) launched the national Planning Practice Guidance (PPG) web-based resource. The PPG on Noise (last updated in July 2019) expands upon the NPPF and NPSE and sets out more detailed guidance on noise assessment.

Like the NPPF and NPSE, the guidance does not include any specific noise levels but sets out further principles that should underpin an assessment. The PPG includes a section on noise, paragraph 003 of the which states:

"Plan-making and decision making need to take account of the acoustic environment and in doing so consider:

- whether or not a 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 refers to the NPSE and states that the aim is to identify where the overall effect of the noise exposure falls in relation to the relevant SOAEL, LOAEL and, by inference, the NOEL. Definitions for these thresholds are provided again with the PPG, which differ very slightly in wording to the NPSE, but are taken to be identical in their meaning.

In relation to the SOAEL, LOAEL and NOEL, the PPG makes the following important statement:

"Although the word 'level' is used here, this does not mean that the effects can only be defined in terms of a single value of noise exposure. In some circumstances adverse effects are defined in terms of a combination of more than one factor such as noise exposure, the number of occurrences of the noise in a given time period, the duration of the noise and the time of day the noise occurs."

The guidance then presents a table, which is reproduced in the following table. The implication of the final line of the table is that only the 'present and very disruptive' outcomes are unacceptable and should be prevented. All other outcomes (i.e. all other lines in the table) can be acceptable, depending upon the specific circumstances and factors such as the practicalities of mitigation.

On that basis, noise levels deemed to be below the SOAEL can be considered acceptable providing noise has been mitigated and reduced to a minimum.

Table 1.1 Planning Practice Guidance summary of noise exposure hierarchy.

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

It is noteworthy that the PPG states that:

"Noise impacts may be partially offset if residents have access to one or more of:

- a relatively quiet facade (containing windows to habitable rooms) as part of their dwelling;

- a relatively quiet external amenity space for their sole use, (e.g. a garden or balcony). Although the existence of a garden or balcony is generally desirable, the intended benefits will be reduced if this area is exposed to noise levels that result in significant adverse effects;

- a relatively quiet, protected, nearby external amenity space for sole use by a limited group of residents as part of the amenity of their dwellings; and/or

- a relatively quiet, protected, external publically accessible amenity space (e.g. a public park or a local green space designated because of its tranquillity) that is nearby (e.g. within a 5 minute walking distance).

Guidance Documents

The ProPG and BS 8233:2014

The Professional Practice Guidance on Planning & Noise – New Residential Development, 2017 (ProPG) was prepared by the Institute of Acoustics, the Chartered Institute of Environmental Health and the Association of Noise Consultants.

In relation to residential development, the ProPG builds on the principles and criteria set out BS 8233:2014 – Guidance on sound insulation and noise reduction for buildings (BS 8233).

While the ProPG it is helpful in many ways, it must be noted that the guidance and supplementary documents "*does not constitute an official government code of practice and neither replaces nor provides an authoritative interpretation of the law or government policy on which users should take their own advice as appropriate*".

Section 2.27 of the ProPG states:

"It is considered that suitable guidance on internal noise levels can be found in "BS8233:2014: Guidance on sound insulation and noise reduction for buildings". Table 4 in Section 7.7.2 of the standard suggests indoor ambient noise levels for dwellings (when unoccupied) and states that "in general, for steady external noise sources, it is desirable that the internal ambient noise level does not exceed the guideline values". The standard states (Section 7.7.1) that "occupants are usually more tolerant of noise without a specific character" and only noise without such character is considered in Table 4 of the standard."

Indeed, ProPG expands on the advice and notes of BS 8233 Table 4, with relevant sections presented below:

Table 1.2 BS8233/ProPG internal noise criteria

Activity	Location	Internal Ambient Noise Level	
		Daytime (0700-2300)	**Night time (2300-0700)**
Resting	Living Room	35 dB $L_{Aeq,16hour}$	-
Dining	Dining room / area	40 dB $L_{Aeq,16hour}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,8hour}$ 45 dB $L_{Amax,f}$ (Note 4)

Note 4

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

Note 5

"… Where it is not possible to meet internal target levels with windows open, internal noise levels can be assessed with windows closed, however any façade openings used to provide whole dwelling ventilation (e.g. trickle ventilators) should be assessed in the "open" position and, in this scenario, the internal L_{Aeq} target levels should not normally be exceeded subject to the further advice in Note 7."

Note 7

"Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal L_{Aeq} target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved. The more often internal L_{Aeq} levels start to exceed the internal L_{Aeq} target levels by more than 5 dB, the more that most people are likely to regard them as "unreasonable". Where such exceedances are predicted, applicants should be required to show how the relevant number of rooms affected has been kept to a minimum. Once internal L_{Aeq} levels exceed the target levels by more than 10 dB, they are highly likely to be regarded as "unacceptable" by most people, particularly if such levels occur more than occasionally. Every effort should be made to avoid relevant rooms experiencing "unacceptable" noise levels at all and where such levels are likely to occur frequently, the development should be prevented in its proposed form."

With respect to external amenity spaces, ProPG again points to BS 8233 that states:

"the acoustic environment of external amenity areas that are an intrinsic part of the overall design should always be assessed and noise levels should ideally not be above the range 50 – 55 dB $L_{Aeq,16hr}$…"

"…These guideline values may not be achievable in all circumstances where development might be desirable. In such a situation, development should be designed to achieve the lowest practicable noise levels in these external amenity spaces but should not be prohibited."

The above thresholds (adjust as necessary taking into account the relevant notes) are taken to correspond to LOAELs, when considered in relation to the PPG and NPSE.

The ProPG sets out the principle of the "*Acoustic Design Statement*" (ADS) in which noise is quantified and assessed, and mitigation measures determined in line with the methodology set out therein. The preparation of an ADS is not relevant or appropriate for all sites, however many of the principles are those which would typically be adopted when preparing noise assessment for planning submissions etc.

Features which may be included within an ADS comprise:

- An initial site noise risk assessment;
- A description of external site noise levels before and after mitigation measures;
- Demonstrations of good acoustic design principles;
- Details of how internal noise guidelines will be achieved;
- Assessment of the impact of $L_{Amax,F}$ noise levels where guidelines values are exceeded;
- An aim to achieve internal noise guidelines with windows open where practical, noting this approach will not necessarily be possible. Due consideration should be given to ventilation and thermal comfort with windows closed;
- Acoustic design to achieve good living conditions where internal noise guidelines can only be achieved with windows closed (noting the guidelines are not applicable when windows are open to provide purge ventilation);
- Information regarding the steps taken to minimise overheating where this is relevant to noise;
- A consideration of noise to external amenity areas;
- A presentation of the findings of the assessment, resulting noise impacts and any mitigation measures that may be required.

The ProPG states that *"It is imperative that acoustic design is considered at an early stage of the development process"*. The following aspects of good acoustic design should be considered:

- Check the feasibility of relocating or reducing noise levels from relevant sources.
- Consider options for planning the site or building layout.
- Consider the orientation of proposed buildings.
- Select construction types and methods for meeting building performance requirements.
- Examine the effects of noise control measures on ventilation, fire regulation, health and safety, cost, CDM (construction, design and management) etc.
- Assess the viability of alternative solutions.
- Assess external amenity area noise.

With regard to the initial site noise risk assessment, the ProPG sets out the following table. It is important to understand that a site with external noise levels categories as high risk does not mean that site is necessary unsuitable for development. Instead, I means that a good acoustic design process must be followed to ensure suitable conditions are provided to future occupants.

Image 1: ProPG Stage 1 Initial Site Risk Assessment

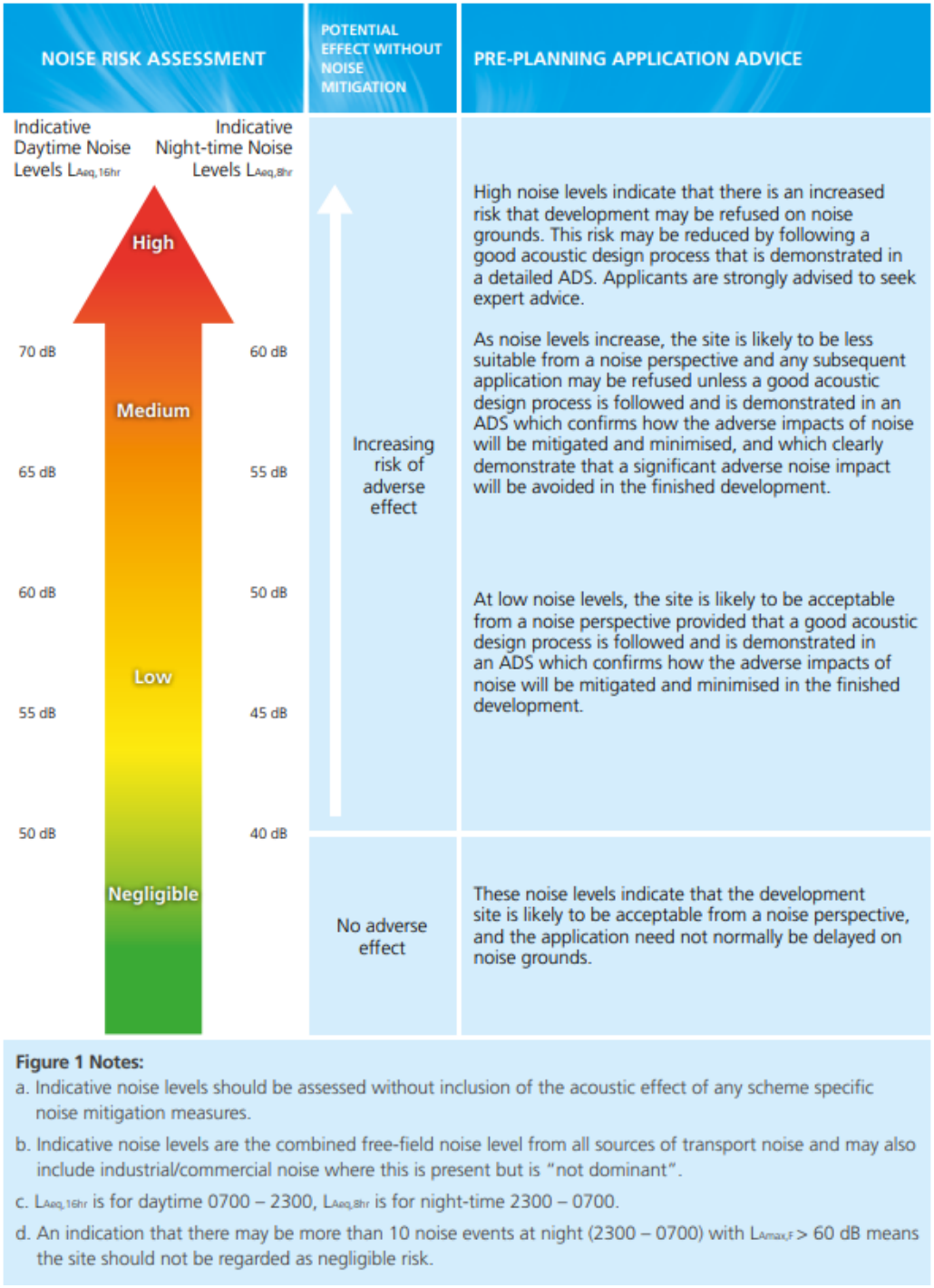

Figure 1 Notes:

a. Indicative noise levels should be assessed without inclusion of the acoustic effect of any scheme specific noise mitigation measures.

b. Indicative noise levels are the combined free-field noise level from all sources of transport noise and may also include industrial/commercial noise where this is present but is "not dominant".

c. $L_{Aeq,16hr}$ is for daytime 0700 – 2300, $L_{Aeq,8hr}$ is for night-time 2300 – 0700.

d. An indication that there may be more than 10 noise events at night (2300 – 0700) with $L_{Amax,F}$ > 60 dB means the site should not be regarded as negligible risk.

As neither the ProPG of BS 8233 form statutory guidance or regulations, it falls to the acoustics practitioner (or other similar party) to determine how the documents should be interpreted and how their contents are applied to any given scheme.

Building Regulations Approved Document O: Overheating

The Building Regulations Approved Document O (ADO) on overheating was published In December 2021. It sets out requirements to ensure that overheating (and related effects) within new residential buildings are suitably controlled.

ADO took effect on 15 June 2022 in England but does not apply to work subject to a building notice, full plans application or initial notice submitted before that date, provided the work for each building was started before 15 June 2023.

The statutory, legal requirements of ADO are replicated below, with particular attention drawn to part O1(2)(a):

Requirement O1(2)(a)

This section deals with requirement O1(2)(a) of Schedule 1 to the Building Regulations 2010.

Requirement

Requirement	*Limits on application*
O1 Overheating mitigation	
(1) Reasonable provision must be made in respect of a dwelling, institution or any other building containing one or more rooms for residential purposes, other than a room in a hotel ("residences") to—	
(a) limit unwanted solar gains in summer;	
(b) provide an adequate means to remove heat from the indoor environment.	
(2) In meeting the obligations in paragraph (1)—	
(a) account must be taken of the safety of any occupant, and their reasonable enjoyment of the residence; and	
(b) mechanical cooling may only be used where insufficient heat is capable of being removed from the indoor environment without it.	

Intention

In the Secretary of State's view, requirement O1(2)(a) is met in a new residential building if the building's overheating mitigation strategy for use by occupants takes account of all of the following.

a. Noise at night – paragraphs 3.2 to 3.4.
b. Pollution – paragraph 3.5.
c. Security – paragraphs 3.6 and 3.7.
d. Protection from falling – paragraphs 3.8 to 3.10.
e. Protection from entrapment – paragraph 3.11.

It can be seen that accounting for potential noise effects at night is an important consideration when addressing the requirements of part O1(2)(a), in relation to ensuring the "reasonable enjoyment of the residence".

Section 3.2-3.4 of ADO sets out the following guidance with respect to noise. This does not form part of the statutory requirement but serves as guidance for how, in the Secretary of State's view, noise should be addressed when considering overheating:

Noise

3.2 In locations where external noise may be an issue (for example, where the local planning authority considered external noise to be an issue at the planning stage), the overheating mitigation strategy should take account of the likelihood that windows will be closed during sleeping hours (11pm to 7am).

3.3 Windows are likely to be closed during sleeping hours if noise within bedrooms exceeds the following limits.

a. 40dB $L_{Aeq,T}$, averaged over 8 hours (between 11pm and 7am).

b. 55dB L_{AFmax}, more than 10 times a night (between 11pm and 7am).

3.4 Where in-situ noise measurements are used as evidence that these limits are not exceeded, measurements should be taken in accordance with the Association of Noise Consultants' *Measurement of Sound Levels in Buildings* with the overheating mitigation strategy in use.

NOTE: Guidance on reducing the passage of external noise into buildings can be found in the *National Model Design Code: Part 2 – Guidance Notes* (MHCLG, 2021) and the Association of Noise Consultants' *Acoustics, Ventilation and Overheating: Residential Design Guide* (2020).

The language of the text preceding the "limits" is section 3.3 suggest that these could be taken as guideline figures to assist the designer in identifying where noise issues may arise. The guidance does not state that noise levels must not exceed the "limits", or that windows would always be shut where the above thresholds are exceeded, only that "windows are likely to be closed during sleeping hours" under such noise conditions.

At time of writing draft acoustics industry guidance on the interpretation of the ADO is subject to consultation (discussed in the following section). It may therefore be necessary to revise the approach regarding how overheating is considered in the context of noise.

It is important to note that in the context of ADO, the use of mechanical ventilation (e.g. MVHR) is considered a "passive means" of cooling a building. As per the requirements of ADO, "mechanical cooling" such as air conditioning may only be considered where all other passive methods of cooling are found to be insufficient.

Approved Document O Noise Guide, November 2024

The above-titled guide provides guidance for practitioners when implementing the requirements of Approved Document. It is designed to assist the acoustics industry in the understanding of what is published in the regulation and provides an agreed interpretation of the content.

The following external noise thresholds are set out in table 1 of the guidance. These thresholds apply when using the Simplified Method set out within ADO and relate to high and moderate overheating risk areas (again, as described within ADO):

Table 1 External Noise Levels Above Which the Simplified Method Cannot Be Used

Parameter	High Risk Location	Moderate Risk Location
$L_{Aeq,8h}$, averaged over 8 hours (between 11pm and 7am)	45 dB	50 dB
L_{AFmax}, more than 10 times a night (between 11pm and 7am)	60 dB	65 dB

Note: Several assumptions have been used to determine the outside-to-inside level difference. These are: 2.4m bedroom height, 0.5s bedroom RT, simple hole in the façade of area sufficient to provide the required Equivalent Area, no sound transmission other than via the opening. Calculation according to Equation G.1 of BS 8233:2014 [Ref. 7].

The table sets external noise thresholds based on achieving the 40 dB $L_{Aeq,8hour}$ and 55 dB $L_{Amax,f}$ thresholds set out in the ADO, but a 5 dB reduction in noise offered by a façade opening in high overheating risk areas or a 10 dB reduction in moderate overheating risk locations. These losses are linked to the areas of opening that related to the ventilation provision requirements of the ADO Simplified Method.

As Hordean falls outside of London (and the other areas identified in Appendix C of the ADO), it is classed as a having a “moderate” overheating risk when considered in accordance with the simplified method set out within the ADO. Therefore, external levels of 50 dB $L_{Aeq,8hour}$ and 65 dB L_{AFmax} can be taken as a thresholds to identify where open windows could not be used to control overheating effects.

Where the Simplified Method cannot be used, or where the developer decides they want to use an alternative approach to the Simplified Method, dynamic thermal modelling is required. The ADO noise guide provides a means for acoustic consultant to provide guidance to the dynamic thermal modelling consultant (DTMC) to support this more detailed approach.

The ADO Noise Guide sets out a means to calculate the permitted Equivalent Area of facade opening that can be considered during dynamic thermal modelling, based on the noise constraints of a given site. This essentially limits the amount of window (or other ventilation) opening than can be considered by the DTMC, based on the noise level difference that is required through the façade to achieve the relevant ADO noise thresholds. When considering façade incident external noise levels, the following formula applies:

Equation 1[8]

$$EA\ based\ on\ façade\ level\ difference = V \times 10^{\left(\frac{-(D_{2m,nT}+5)}{10}\right)}$$

Where

$D_{2m,nT}$ *is the is the façade level difference between the A-weighted level 2m in front of the façade ($L_{1,2m}$), and the standardised internal A-weighted level ($L_{eq,2,nT}$). In the absence of any better alternative method, the same principle can be applied to L_{AFmax}.*

V *is the room volume (m^3)*

EA *is the Equivalent Area of the open window (m^2)*

When considering free field external noise levels, the following formula applies:

Equation 2[8] $$EA\ based\ on\ freefield\ level\ difference = V \times 10^{\left(\frac{-(D_{nT}+8)}{10}\right)}$$

Further guidance is provided in the guide with respect to ventilation louvres. This is not replicated here for the same of brevity but shall be considered when necessary and appropriate.

Where it is necessary to either totally or partially restrict the use of open windows due to external noise constraints and provide additional ventilation or cooling through mechanical means, the following suggested internal noise thresholds are set out within the ADO noise guide:

Parameter	Bedrooms
Mechanical ventilation or mechanical cooling system noise	$L_{Aeq,T}$ 30 (±5) dB

Further to the above, the following is noted:

> *"Higher noise levels than those in Table 2, e.g. by up to 10 dBA, may be appropriate in some operating scenarios, where rapid changes to the cooling or ventilation rates quickly improve the thermal comfort of the occupant. Equally, lower noise levels may be appropriate for some types of residential development"*

The guide also provides information regarding assessment uncertainty, post-completion noise measurements (not recommended to be undertaken), reporting and other factors. These elements are not set out here for the sake of brevity but are considered where necessary and appropriate.

AVO Residential Design Guide, 2020

The Acoustics, Ventilation and Overheating Residential Design (AVO) Guide, prepared by the Association of Noise Consultants was written to provide guidance on the control of noise in the context of overheating control. It is noteworthy that this guidance was published before both the ADO and ANC guidance set out in the previous section and therefore has to a large degree been superseded. It is still however useful reference and a helpful guide for context.

A key principle of the AVO is that internal noise in excess of the normal criteria set out within the ProPG and BS 8233:2014 are acceptable during the overheating condition, when open windows are used to provide a cooling effect. The amount by which internal noise conditions may be elevated is related to the duration over which overheating occurs and the guidance regencies the numerous methods to control overheating (beyond simple open windows).

Where external noise levels are equal to or fall below circa 53 dB $L_{Aeq,16hour}$ or 48 dB $L_{Aeq,8hour}$ the use of opening windows as primary means of mitigating overheating is not likely to result in adverse effect. Above these thresholds, it is for the acoustics practitioner to determine the potential for adverse effect.

Where external noise levels are high (above approximately 65 dB $L_{Aeq,16hour}$ or 55 dB $L_{Aeq,8hour}$) a "Level 2 assessment" is recommended, where the internal noise levels in the above BS 8223 table are effectively taken as the LOAEL.

Interpreted values of the AVO guide Table 3-3 (for Level 2 assessment) are repeated below with reference to the PPG thresholds for clarity.

Table 1.3 Summary of AVO Criteria

Bedroom Internal Ambient Noise Level (with windows open)			Action
Daytime $L_{Aeq,16hour}$	**Night** $L_{Aeq,8hour}$	**Night** $L_{Amax,F}$	
NOAEL – No Observed Adverse Effect Level			
≤ 35 dB	≤ 30 dB	Not normally exceeding 45 dB more than 10 times per night	No specific measures required
LOAEL - Lowest Observed Adverse Effect Level			
35 dB	30 dB	Exceeding 45 dB more than 10 times per night but not exceeding 65 dB	Mitigate and reduce to a minimum
SOAEL - Significant Observed Adverse Effect Level			
50 dB	42 dB	Normally exceeds 65 dB	Avoid / Prevent

The implication is that for circumstances where additional ventilation is necessary for cooling, but internal noise levels with windows open are between the LOAEL and a SOAEL, means to reduce noise should be introduced where possible but it is not necessary to achieve the BS 8233 levels.

British Standard BS 4142

British Standard 4142:2014+A1:2019 (Methods for rating and assessing industrial and commercial sound) states in section 1.1:

> *"This British Standard describes methods for rating and assessing sound of an industrial and/or commercial nature, which includes:*
>
> *a) sound from industrial and manufacturing processes;*
>
> *b) sound from fixed installations which comprise mechanical and electrical plant and equipment;*
>
> *c)sound from the loading and unloading of goods and materials at industrial and/or commercial premises; and*
>
> *d)sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises or processes, such as that from fork-lift trucks, or that from train or ship movements on or around an industrial and/or commercial site.*
>
> *The methods described in this British Standard use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident."*

The standard states its applications as,

> *"This standard is applicable to the determination of the following levels at outdoor locations:*
>
> *a) rating levels for sources of sound of an industrial and/or commercial nature; and*
> *b) ambient, background and residual sound levels,*
>
> *for the purposes of:*

1) investigating complaints;
2) assessing sound from proposed, new, modified or additional source(s) of sound of an industrial and/or commercial nature; and
3) assessing sound at proposed new dwellings or premises used for residential purposes."

BS 4142 sets out a daytime assessment period of 1 hour and night time period of 15 minutes. The assessment methodology requires that a "specific level" from a given noise source is determined considering these time periods. Character corrections should be added if the noise has tonality, impulsivity, intermittency or other such characteristics; this gives the "rating level" of a given noise source. The level of the correction is based upon how the noise is perceived, as set out in the standard.

The rating level of noise, $L_{Ar,\,Tr}$, for the relevant assessment period is the calculated noise level at the nearest receiver location, adjusted to take into account the acoustic characteristic of the noise. Acoustic feature corrections can be made to account for tonality, impulsivity, intermittency and other characteristics present in the resultant sound at the receiver position. The magnitude or appropriateness of any correction will depend both on the type of noise source and the context in which it is perceived. Similarly, in accordance with BS 4142, the period of time for which an individual noise source is active during the relevant reference time period will also be considered in establishing the rating level.

It will also be necessary to consider the existing noise climate and what sound sources contribute to it. For example, where a noise generating activity is proposed adjacent to an existing similar noise generating site, the impact of the new noise source would be less than if it were to be planned in a location where its character and type is different to and more noticeable than any existing noise source nearby.

With regard to the background sound level against which the rating level is compared, the standard states the following:

"In using the background sound level in the method for rating and assessing industrial and commercial sound it is important to ensure that values are reliable and suitably represent both the particular circumstances and periods of interest. For this purpose, the objective is not simply to ascertain a lowest measured background sound level, but rather to quantify what is typical during particular time periods."

The periods of interest over a 24 hour day are usually related to day time activities (07:00-23:00h) and night time (23:00-07:00h). However the standard makes the following statement:

"Among other considerations, diurnal patterns can have a major influence on background sound levels and, for example, the middle of the night can be distinctly different (and potentially of lesser importance) compared to the start or end of the night-time period for sleep purposes. Furthermore, in this general context it can also be necessary to separately assess weekends and weekday periods."

Therefore, the periods of time which can be considered as 'waking up' and 'falling asleep' stages, for example 06:00h to 07:00h and 23:00h to 24:00h, may need to be considered independently. Alternative periods may also be identified where breakdown beyond the standard day and night time analysis will be necessary, for example where background sound levels are shown to be regularly elevated.

Similarly, both weekend and weekday periods may need to be considered separately, with criteria set for both. The requirement to analyse specific time periods should be considered for each site individually.

Once the rating level at each receptor has been calculated, reference can be made to the following commentary in BS 4142 in relation to conducting an initial assessment of the impact, based on the difference between the rating level of the noise source and the pre-existing background sound level.

> *"Obtain an initial estimate of the impact of the specific sound by subtracting the measured background sound level (see Clause 8) from the rating level (see Clause 9), and consider the following.*
>
> *NOTE 1 More than one assessment might be appropriate.*
>
> *a) Typically, the greater this difference [between industrial site noise rating level and baseline background level], the greater the magnitude of the impact.*
>
> *b) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.*
>
> *c) A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.*
>
> *d) 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.*
>
> *NOTE 2 Adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact."*

In situations where background sound levels are low, it is important to again consider context, rather than simply basing an assessment of impact on a difference in noise level, as suggested above. With regards to context in relation to absolute noise levels, the standard states the following:

> *"1) The absolute level of sound. For a given difference between the rating level and the background sound level, the magnitude of the overall impact might be greater for an acoustic environment where the residual sound level is high than for an acoustic environment where the residual sound level is low.*
>
> *Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night.*
>
> *Where residual sound levels are very high, the residual sound might itself result in adverse impacts or significant adverse impacts, and the margin by which the rating level exceeds the background might simply be an indication of the extent to which the specific sound source is likely to make those impacts worse."*

British Standard BS 4142:2014 does not set out guidance for what constitutes low background noise levels. Instead, it can be inferred from the World Health Organisation Night Guidelines for Europe (2009) that a noise level of ≥30 dB $L_{night,outside}$ is not likely to give rise to any substantial observed noise effects.

Although the above criterion relates to an 8-hour period between 23:00 and 07:00 (i.e. the night time), the application of the criterion to any given 15 minute period during the night time (or one hour if applied to the daytime) effectively makes the criterion more stringent.

Taking into account the above therefore, it is suggested that noise limits for mechanical services plant equipment should be set with a lower threshold of 30 dB $L_{Ar,Tr.}$ Noise levels equal to or below this threshold figure would not be expected to give rise to substantial observed effects (i.e. the impact would be low).

From the above, it can be concluded that ensuring noise emissions from a given site or activity do not exceed noise limits set at a level 5 dB above the representative background noise levels (or at the 30 dB $L_{Ar,Tr.}$ threshold where background sound level are low) at a given receptors will provide an indication that noise adverse effect will **not** occur. Such a limit would therefore represent the LOAEL in relation to the thresholds set out within the PPG.

Local Context, Planning Policy and Guidance

Relevant Local Planning Context

The proposed development is known as "*Allocation 1: Southleigh"* in the emerging Havant Borough Council (HBC) Local Plan, *"Building a Better Future"*.

The allocation has an area of 146.32 ha. It is proposed for residential development with an indicative yield of 2,100 dwellings, 1,650 of which would be delivered in the plan period.

Havant Borough Local Plan: Core Strategy and Allocations

Havant Borough Core Strategy was adopted in March 2011. The document contains a number of policies, some of which are relevant to noise. Policy CS16 *High Quality Design* states:

> *"Planning permission will be granted for development that is designed to a high standard, which helps to create places where people want to live, work and relax."*

The policy goes on to state that development should *"not cause unacceptable harm to the amenity of neighbours"* as a result of noise.

The Havant Borough Local Plan (Allocations) was adopted in July 2014. Policy DM18 of the document states the following:

> *"Planning permission will be granted for development provided that projected levels of … noise … do not have significant negative affect on the amenity of future occupiers or users of the proposed development."*

2. This policy compliments Policy DM10 of HBC's Core Strategy document. The aspects of Policy DM10 relating to noise are as follows:

> *"Development that may cause … pollution through noise, … will only be permitted where all of the following relevant criteria can be met:*
>
> *1. The health and safety of existing and future users of the site, or nearby occupiers and residents is not put at risk.*
> *…"*

This appendix supports a noise assessment process which addressed the above requirements to demonstrate how the proposed development will not cause unacceptable harm to the amenity of neighbours.

Beyond the above, the policy explanatory text largely refers to national government guidance on noise (as has been set out previously within this appendix.)

It is understood that a new local plan titled *'Building a Better Future Plan'* is being worked on to replace the Core Strategy and Allocations Plans however at the time of writing this has not been adopted therefore the Core Strategy and Allocation Plans is still in use.