



209-219 Henley Road, Caversham

Noise Assessment

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prepared for

Knowles Retirement Living

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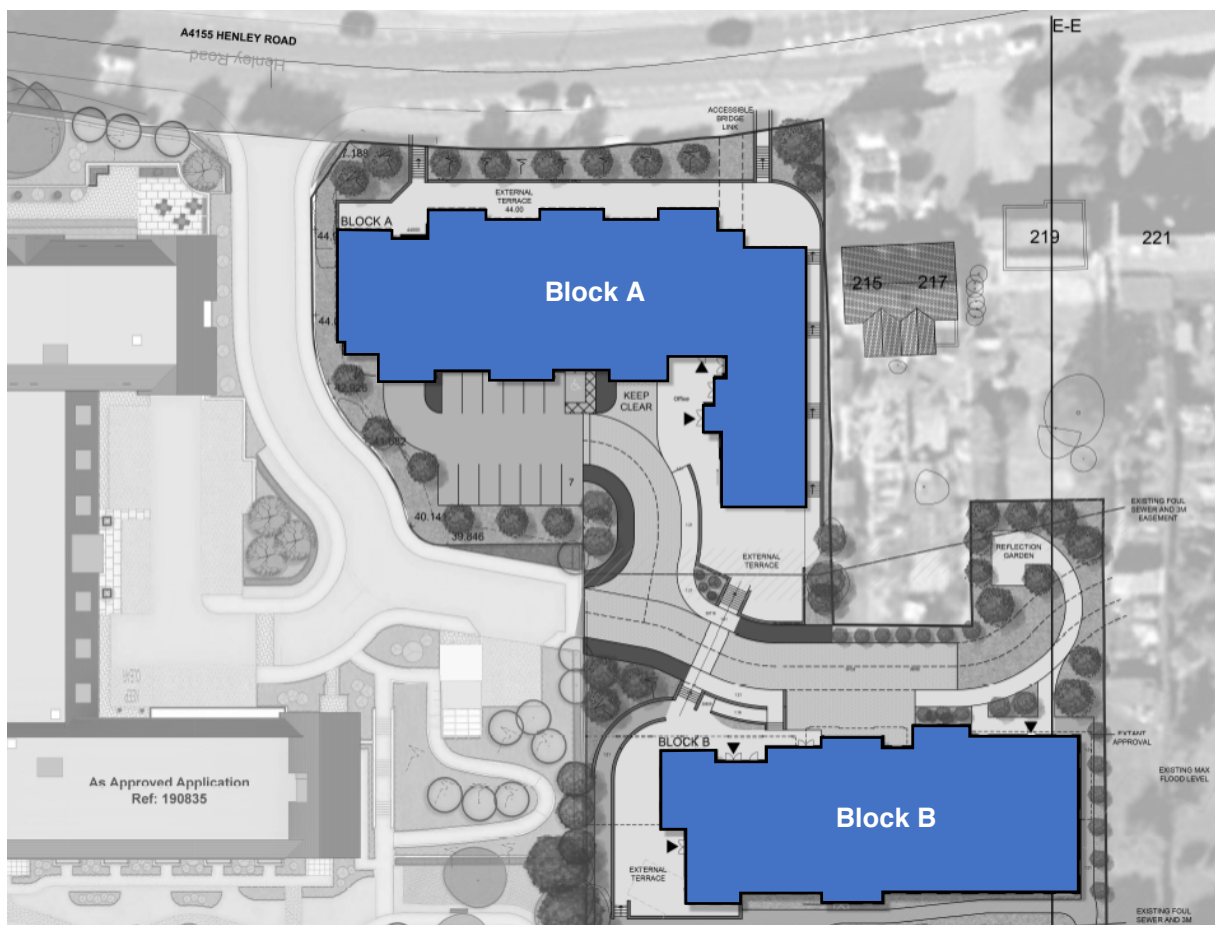
1.0 Introduction

1.1 A new set of apartments consisting of two blocks are proposed on the busy Henley Road in Caversham. We understand a noise assessment has been requested by the Local Authority to be included in the planning application to consider noise intrusion into the future apartments.

1.2 A noise survey upon which to base the noise assessment is to be undertaken imminently. In the meantime, this draft noise assessment report sets out a preliminary assessment of noise based on survey information contained in the noise report of a recent planning application for a neighbouring site.

2.0 Locality and Scope

2.1 The site is located on the southern side of the A4155 Henley Road as indicated in the following plan. Block A is to be located approximately 15m from the nearside kerb of the road, which is a comparable distance to other houses which are to be retained, and the retirement home that is currently under construction.



2.2 The following noise survey details are taken from the *Sharps Redmore* report submitted in support of the retirement home (planning reference 190835). We believe the survey data is

representative of the façade noise levels fronting Henley Road at the same distance from the road that Block A of this scheme is proposed.

2.3 It is proposed to naturally ventilate the proposed apartments, and the scheme will therefore be absent of any notably noisy mechanical services equipment. The only potential noise concern once the scheme is complete, therefore relates to the acceptability of internal road traffic noise levels for future residents.

3.0 Planning Context

3.1 A review of relevant national policy, local policy and guidance is presented in the attached Appendix A. In summary, there is no specific external noise level that may prohibit a site being developed, providing:

- Adequate means to achieve reasonable internal levels can be achieved.
- External amenity areas should not normally exceed 55dB $L_{Aeq,16hr}$.

3.2 We advocate the following internal noise criteria of BS8233:2014, subject to additional clarifications regarding ventilation to control overheating, and that exceedances of the following L_{Aeq} values of up to 5dB may be acceptable in some circumstances.

Table 3.1 Indoor ambient noise levels for dwellings

Activity	Location	0700 to 2300	2300 to 0700
Resting	Living Room	35dB $L_{Aeq,16hr}$	-
Dining	Dining Room/area	40dB $L_{Aeq,16hr}$	-
Sleeping (daytime resting)	Bedroom	35dB $L_{Aeq,16hr}$	30dB $L_{Aeq,8hr}$

4.0 Noise Survey

Methodology and Instrumentation

4.1 Unattended noise measurements were undertaken at a single position on site over a 24hr period between 3-4 August 2021.

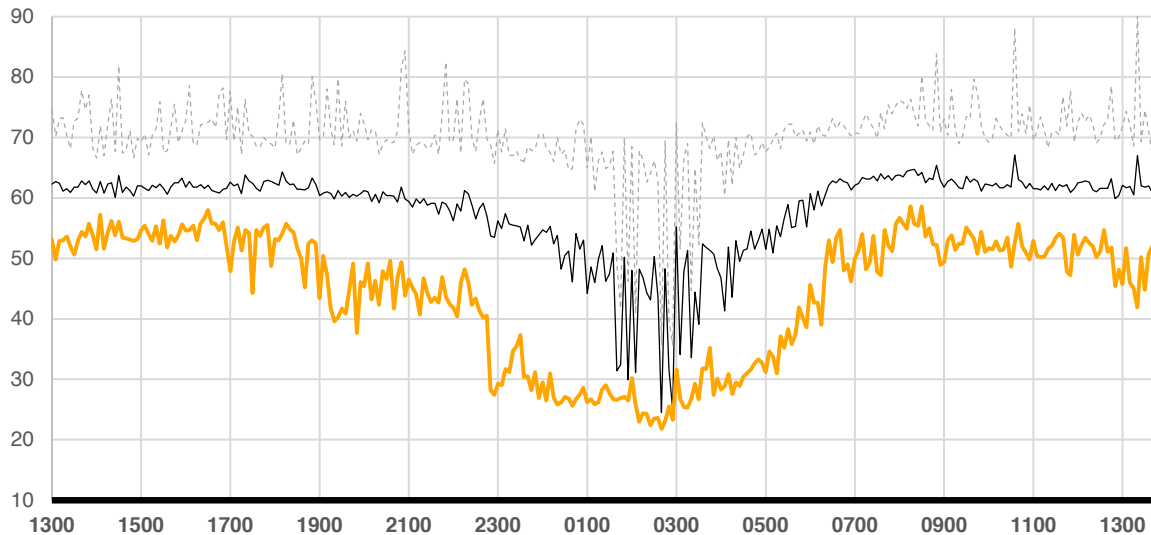
4.2 These were undertaken with a Norsonic 140 sound level analyser fitted with a weatherproof windshield (Norsonic 1214). The analyser was calibrated before and after the survey, with no significant drift recorded during the survey.

4.3 The microphone was attached to a pole out of a first-floor window at 211 Henley Road, facing towards Henley Road and being 1m from the façade.

4.4 When setting the equipment up, the weather was warm and sunny with some cloud cover and no wind noted. Weather conditions were similar upon collection and are expected to have remained suitable overnight. No rain fell during the survey period.

Survey Results

4.5 The following graphs presents the measured background ($L_{A90,5min}$, orange), ambient ($L_{Aeq,5min}$, black) and short-duration maximum ($L_{Amax,5min}$, grey dashed) noise levels. The graph is in terms of sound pressure level (dBA, y-axis) against time (hours, x-axis).



4.6 Representative ambient day and night-time levels have been calculated to be:

- Daytime $L_{Aeq,16hr}$ (0700-2300) 62 dB
- Night-time $L_{Aeq,8hr}$ (2300-0700) 55 dB

4.7 The representative maximum event level is taken to be:

- Night-time L_{Amax} (2300-0700) 71 dB

4.8 The noise climate is dominated by traffic on Henley Road, as can be seen by the diurnal pattern in the time history above, when traffic lessens overnight.

4.9 Construction works were noted to the west at what was 205 Henley Road. The majority of the noisy works occurred to the rear and are expected to have had an insignificant effect on the measured noise levels. Infrequent events are expected to have occurred in view of the microphone, which are shown by the small peaks in the ambient noise levels during the daytime; these peaks have not been removed from the levels used in the assessment to form a robust approach.

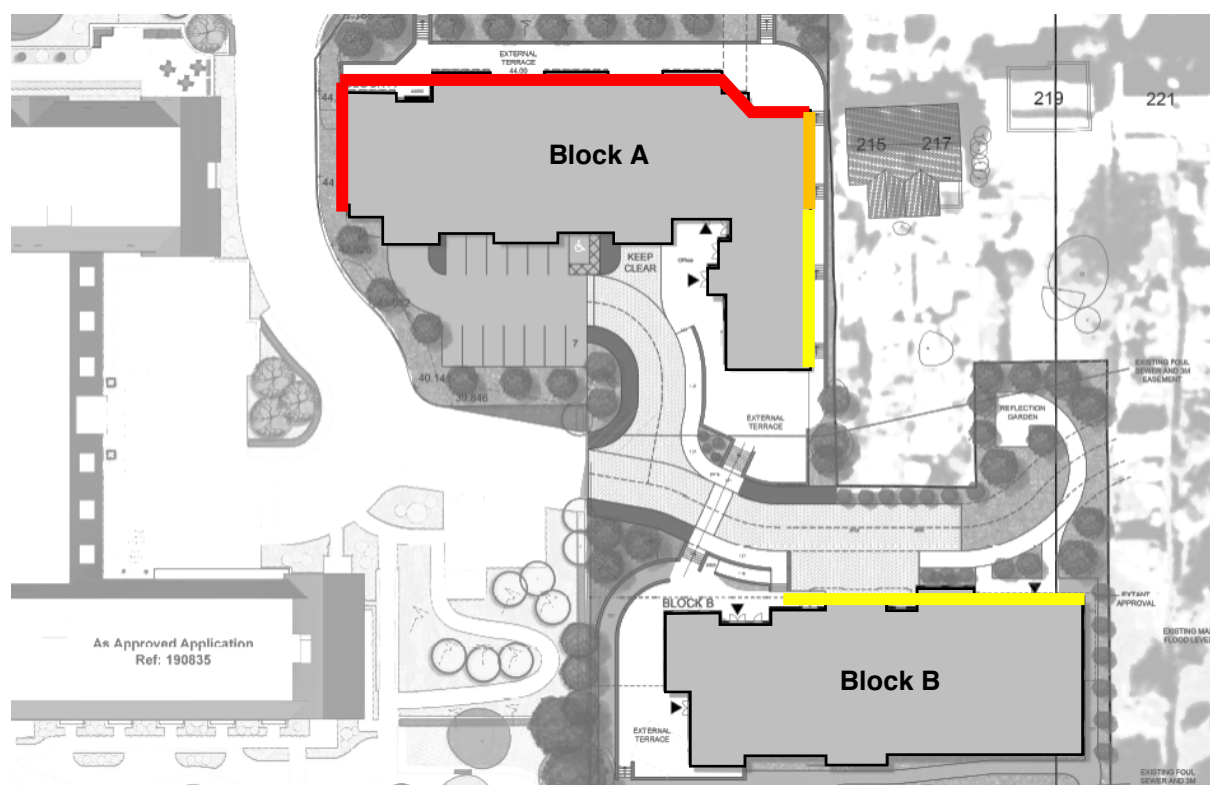
5.0 Noise Assessment

5.1 External noise levels will vary around the building. The following plans presents the calculated variation in noise level due to varying exposure to noise from the A4155. There are four façade groups identified as follows and it is noted that, with respect to external amenity, locations screened or otherwise set back from the road are not expected to be exposed to levels above 55dB $L_{Aeq,16h}$.

Table 5.1 Calculated External Noise Levels

Façade Group	External Free-field Level, Daytime	Internal Level, Window Open
A	65-67dB $L_{Aeq,16hr}$	> 50dB
B	60dB $L_{Aeq,16hr}$	47dB
C	53dB $L_{Aeq,16hr}$	40dB
D	< 43dB $L_{Aeq,16hr}$	< 30dB

5.2 Assuming 13dB for a partially open window the above table also presents estimated internal noise levels with window open.



5.3 For façade group D, which corresponds to all locations not indicated in the following figure, we find that there is no acoustic requirement. Windows may be openable for background ventilation and need not be closed to achieve BS8233 internal levels.

5.4 For bedrooms and living rooms on façade group A, noise levels with windows open clearly exceed the relevant criterion, which implies that means of avoiding overheating other than open windows should be provided. Bedrooms and living rooms on all but façade group D would also require windows closed and alternative means of background ventilation to achieve BS8233 internal levels.

5.5 Rearranging the internal building layout, to place non habitable rooms and possibly dining rooms on the noisier facades, would substantially improve this situation: no location would require alternative means of avoiding overheating, and only façade groups A and B would require windows closed and alternative means of background ventilation.

5.6 Avoiding bedrooms and living rooms on façade group A is of particular importance, and for the rest of this assessment, we assume these rooms will not have windows opening onto façade group A. Non habitable rooms such as bathrooms, kitchens, utility, store and wet rooms, as well as dining room, may instead be located here, or bedroom / living rooms which have adequate ventilation provided from alternative façades.

5.7 To control noise intrusion the following acoustic measures will be necessary.

Table 5.2 Summary Noise Control Measures

Façade Group	Non-glazed elements	Glazing	Background Ventilation	Overheating Control
A*	Standard construction	Upgrade glazing	Acoustic trickle vents	Window open
B	Standard construction	Upgrade glazing	Acoustic trickle vents	Window open
C	Standard construction	Standard thermal double glazing	Non-acoustic trickle vents	Window open
D	n/a	Window may be open	Window open	Window open

* No bedrooms and living rooms with windows opening onto façade Group A

5.8 The following table 5.3 sets out the acoustic performance requirement for each of the above elements.

Table 5.3

Item	Typical Construction	Index	Octave Band Centred Frequency					
			125	250	500	1k	2k	4k
Non-glazed elements	Brick/Block wall	R'	35	40	45	50	55	55
Upgraded Glazing	10mm glass, 16mm airspace, 6mm glass	R'	25	25	31	34	34	36
Acoustic Trickle Vents	Such as 2no. Greenwood AWW39	D _{n,e}	37	36	35	36	34	34

5.9 Typical glazing configurations are quoted for guidance only and alternatives may be utilised, in any case acoustic performance of the system proposed must be demonstrated to the satisfaction of Suono. The sound reduction performance quoted above must be achieved by the glazing system taken as a whole in its installed condition. The specification therefore applies to the glazing, the frames and all seals on any openable parts of the systems and any required ventilation or condensation control mechanisms. This list is not exhaustive: no part of the glazing system shall cause the above figures not to be achieved. The glazing supplier should be expected to prove by means of certified test results that the above sound reduction figures can be achieved by the system being proposed. The tests shall be conducted in accordance with BS EN ISO 10140-2:2021.

5.10 The above $D_{n,e}$ value specifies the acoustic reduction of a single¹ vent, based on its area, standardised to an absorption area of 10m^2 . Therefore, the figure is higher than the actual insertion loss that will be provided by the ventilator, as it is dependent on the area of the vent. The $D_{n,e}$ figure is only therefore useful in specifying the product against a given $D_{n,e}$ requirement. Suono shall need to review the selected products, based on the test data provided by the manufacturer, to make sure the required performance will be achieved. Laboratory tests to conform with BS EN ISO 10140-2:2021 “Laboratory measurement of sound insulation of building elements”.

6.0 Conclusions

6.1 An assessment of noise intrusion has been undertaken of the proposed new development at 209-219 Henley Road, Caversham.

6.2 A noise survey has been undertaken on site to quantify day and night-time levels incident on the site.

6.3 A detailed review of national and local planning policy, and other relevant guidance, has been made.

6.4 Calculation of noise levels at each façade of the building have been made, and a careful consideration of external noise intrusion with and without windows open has resulted in a number of acoustic recommendations, including: relocating habitable rooms such as bedrooms and living rooms so that they do not need windows opening on the façade fronting Henley Road; acoustic specifications for glazing and acoustic trickle vents on various façade groups.

6.5 The assessment has demonstrated that a pragmatic approach to the detailed design of the scheme can yield acceptable internal and external noise levels without any requirement for special ventilation and high-performance acoustic glazing.



¹ As noted in Table 5.3, the noise intrusion calculation allows for two vents, as may be necessary to achieve the background ventilation rate for larger rooms, but the $D_{n,e}$ value is to be achieved by only one vent.

Appendix A: Planning Policy

A review of Planning Policy and Assessment Guidance

National Policy

Noise Planning Policy Framework

The National Planning Policy Framework (NPPF) replaces much of what previously existed with regard to planning guidance, including PPG24: Planning and Noise. The NPPF is now the relevant document for defining the national policy toward noise sensitive development. It refers to the Noise Policy Statement for England (NPSE).

PPG24 permitted noise sensitive development in areas subject to low levels of environmental noise while discouraging noise sensitive development in areas subject to high levels of environmental noise. The current policy on sustainable development can be considered as subtly altering the emphasis. The development of a quiet, rural site is by most measures less sustainable than the development of a busy, urban site and the rating of development sites based on prevailing noise levels should now reflect this.

Specifically, on the subject of noise, paragraph 123 of NPPF states:

Planning policies and decisions should aim to:

avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development;

mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions;

recognise that development will often create some noise and existing business wanting to develop in continuance of their business should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established

identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.

Paragraph 123 references to the Noise Policy Statement for England, and no other particular standards. On the general issue of amenity, paragraph 17 states that planning should:

Always seek to secure high quality design and a good standard of amenity for all existing and future occupants of land and buildings

Noise Policy Statement for England

The NPSE 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 (e.g. the Noise Exposure Categories as defined in PPG 24) which determine whether noise sensitive development is suitable and, if so, whether particular mitigation factors need to be considered.

Instead, the NPSE sets out three 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

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.

In essence, therefore, 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 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, which states:

“Local planning authorities’ plan-making and decision taking should 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:

- **Significant Observed Adverse Effect Level (SOAEL).** The level of noise exposure above which significant adverse effects on health and quality of life occur.
- **Lowest Observed Adverse Effect Level (LOAEL).** The level of noise exposure above which adverse effects on health and quality of life can be detected.
- **No Observed Effect Level (NOEL).** The level of noise exposure below which no effect at all on health or quality of life can be detected.

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 ‘noticeable 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.

Planning Practice Guidance summary of noise exposure hierarchy.

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

Local Policy

Adopted Local Plan, 2019

Policy CC8 "Safeguarding Amenity", of the Adopted 2019 Reading Local Plan, states:

"Development will not cause a detrimental impact on the living environment of existing residential properties or unacceptable living conditions for new residential properties, in terms of:

Privacy and overlooking;
Access to sunlight and daylight;
Visual dominance and overbearing effects of a development;
Harm to outlook;
Noise and disturbance;
Artificial lighting;
Vibration;
Dust and fumes;
Smell;
Crime and safety; or
Wind, where the proposals involve new development of more than 8 storeys.

The position of habitable rooms, windows and outdoor living spaces will be particularly important. A back-to-back distance of 20 metres between dwellings is usually appropriate, although the circumstances on individual sites may enable dwellings to be closer without a detrimental effect on privacy...."

Furthermore, Policy EN16 "Pollution and Water Resources" states:

"...Proposals for development that are sensitive to the effects of noise or light pollution will only be permitted in areas where they will not be subject to high levels of such pollution, unless adequate mitigation measures are provided to minimise the impact of such pollution..."

No further guidance or requirement is given relevant to this assessment, although footnote 60 of the Local Plan does reference the ProPG document discussed below.

Guidance Documents

ProPG Planning and Noise – New Residential Development, 2017

The Professional Practice Guidance on Planning & Noise (ProPG) document for new residential development was prepared by the Institute of Acoustics, the Chartered Institute of Environmental Health and the Association of Noise Consultants. While 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 document 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 BS8233 Table 4, with relevant sections presented below.

Activity	Location	Internal Ambient Noise Level	
		0700-2300 hrs	2300-0700 hrs
Resting	Living Room	35dB $L_{Aeq,16hr}$	-
Dining	Dining room / area	40dB $L_{Aeq,16hr}$	-
Sleeping (daytime resting)	Bedroom	35dB $L_{Aeq,16hr}$	30dB $L_{Aeq,8hr}$ 45dB $L_{Amax,f}$ (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 BS8233:2014 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.”

AVO Residential Design Guide, 2020

With reference to windows being closed to achieve adequate internal noise levels (above Notes 5 and 7), it is noted that occasional increases of internal noise levels to achieve additional ventilation for cooling purposes may be acceptable. The Acoustics, Ventilation and Overheating Residential

Design (AVO) Guide, prepared by the Association of Noise Consultants, provides further guidance with respect to this.

Where external noise levels are high (above 65dB $L_{Aeq,16hr}$ or 55dB $L_{Aeq,8hr}$) a “Level 2 assessment” is recommended, where the internal noise levels in the above BS8223 table are effectively taken as the LOAEL. Interpreted values of the AVO guide Table 3-3 are repeated below with reference to the PPG thresholds for clarity.

Bedroom Internal Ambient Noise Level (with windows open)			Action
Daytime $L_{Aeq,16hr}$	Night $L_{Aeq,8hr}$	Night $L_{Amax,F}$	
≤ 35dB	≤ 30dB	Not normally exceeding 45dB more than 10 times per night	No specific measures required
LOAEL - Lowest Observed Adverse Effect Level			
35-50dB	30-42dB	Exceeding 45dB more than 10 times per night but not exceeding 65dB	Mitigate and reduce to a minimum
SOAEL - Significant Observed Adverse Effect Level			
> 50dB	> 42dB	Normally exceeds 65dB	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 BS8223 levels.

