PLANNING NOISE ASSESSMENT

OLD TOWN, NEWBURY

LOCHAILORT NEWBURY LTD

OCTOBER 2024

PLANNING NOISE ASSESSMENT
OLD TOWN, NEWBURY

Our Ref: **7216_001R_2-0_DM**

Client:	**Lochailort Newbury Ltd** Unit C 65 Hopton Street London SE1 9LR
Report by:	**Anderson Acoustics Limited** 3 Trafalgar Mews 15 - 16 Trafalgar Street Brighton BN1 4EZ www.andersonacoustics.co.uk T: 02031767909
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Author	**Doushiant Mohith** Senior Consultant BSc (Hons) MIOA		**14 October 2024**
Reviewed	**Joe Baggaley** Director BSc (Hons) MSc MIOA		**14 October 2024**
Approved	**Joe Baggaley** Director BSc (Hons) MSc MIOA		**14 October 2024**

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1 INTRODUCTION

Anderson Acoustics Ltd was commissioned by Lochailort Newbury Ltd to provide acoustic consultancy services for the proposed Old Town, Newbury residential development, which comprises 317 dwellings. The proposed development is located on the site of the existing Kennet Centre.

A noise assessment for a different scheme in the same location was submitted as part of a previous application Stuart Michael Associates, Report Ref: 6377/NA dated Sept 2023. Since then, this alternative scheme has been proposed, thus requiring a new assessment to be completed. The noise data captured for the previous survey is still considered relevant and has therefore been used to form part of this assessment supplemented by a recent attended survey undertaken by ourselves.

This assessment will form part of the planning application submission.

A brief description of the site is given in Section 2.

Section 3 details the relevant guidance and criteria.

Section 4 provides a summary of the baseline environmental noise conditions at the site.

Sections 5 and 6 present the results of a ProPG Stage 1 and 2 assessments respectively, covering an initial noise risk assessment of the site, good acoustics design, internal ambient noise levels, noise levels in external amenity areas and overheating and ventilation.

The report is summarised in Sections 7.

This report is technical in nature and, as such, a summary of noise units and acoustic terminology can be found here for reference.

2 SITE DESCRIPTION

The project involves a new-build mixed-used development on at the Kennet Centre site comprising the partial demolition of existing buildings, flexible-use commercial space, 317 dwellings plus residents' ancillary facilities, access, car parking and cycle parking, landscaping & communal amenity areas.

The site is located in the centre of Newbury and occupies an area bordered by Cheap Street to the east, Market Street to the south, and Bartholomew Street to the west. During daytime hours (10am to 5pm), Street transforms into a pedestrian zone, barring private vehicles—an initiative the council aims to extend into the evening and across neighbouring roads. Surrounding the site is a mixture of residential and commercial buildings, typically featuring ground-floor shops and offices, with residential dwellings located on the upper floors.

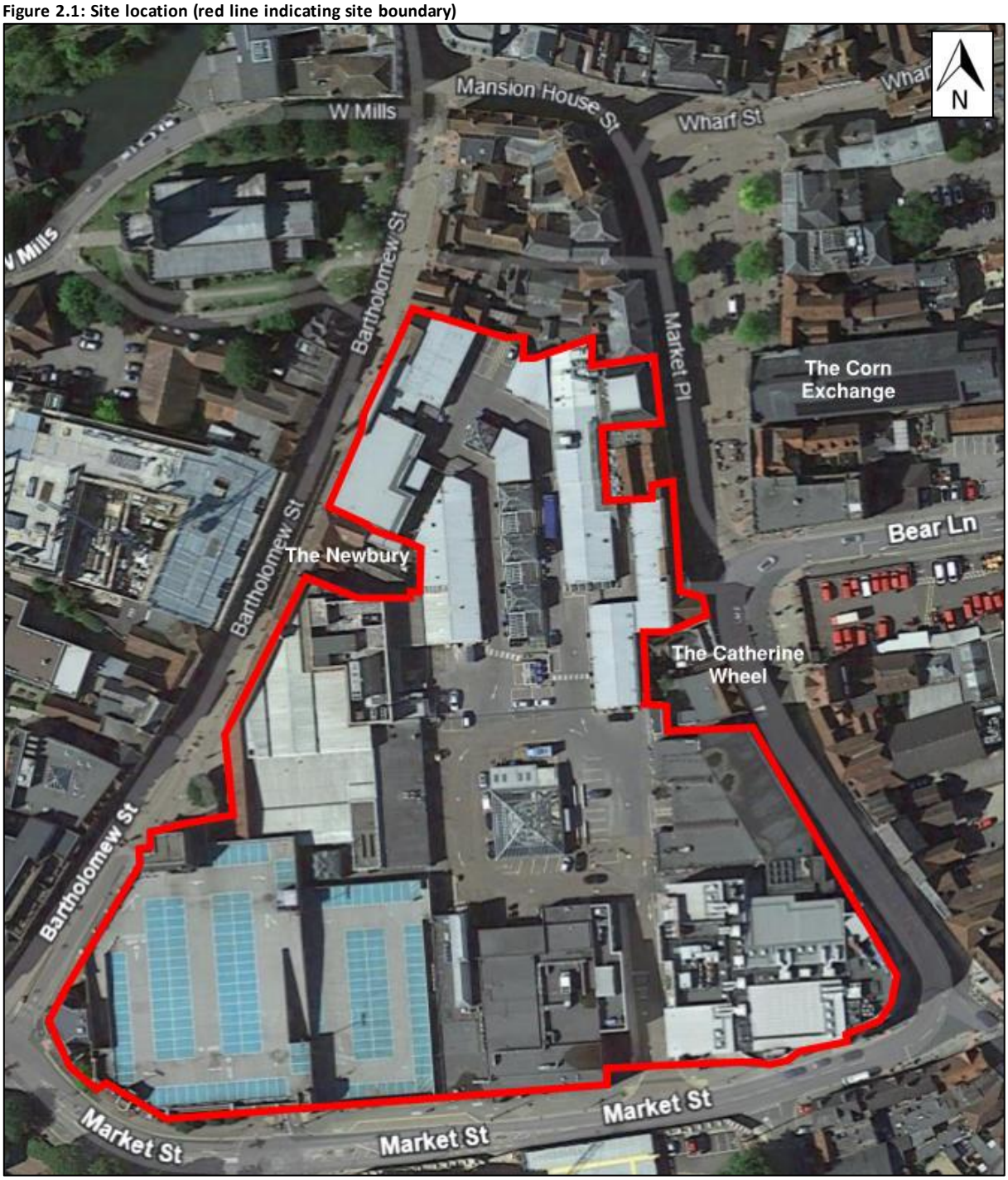
Observations during a site visit indicated that the general noise climate surrounding the site is dominated by entertainment noise emanating from The Newbury Pub and road traffic on surrounding roads.

A nearby pub, The Newbury, situated on the western boundary of the development site, features a rear rooftop terrace hosting live amplified music events. A survey was conducted to assess the potential noise impact of this venue on the future amenity of the development. During the live music events, the venue was identified as the primary noise source. Details of this survey is given in sections Section 4.2 of this report.

The Catherine Wheel pub located to the eastern boundary of the site, has a rear beer garden, proposal indicate that several apartments will overlook this rear garden area.

The site location is shown in Figure 2.1 below.

Figure 2.1: Site location (red line indicating site boundary)



3 RELEVANT GUIDANCE AND CRITERIA

3.1 West Berkshire Council Local Plan (2006-2026)

The relevant local policy document for West Berkshire is presented in the Local Plan, which is part of the Core Strategy Development Plan Document (DPD). The Core Strategy (adopted on 16 July 2012) forms part of the Local Plan for the district.

The Core Strategy is a development plan document which sets out West Berkshire Council's (WBC) overall planning strategy to 2026. It explains its vision for the area, and how it will be delivered. It also provides a framework for more detailed policies which will be contained in future development plan documents prepared as part of the Local Plan.

Local policy for noise is part of the saved policies from the West Berkshire District Local Plan (1991-2006). Policy OVS.6 states that the Council will require appropriate measures to be taken in the location, design, layout and operation of development proposals in order to minimise any adverse impact as a result of noise generated. Special consideration is required where noisy development is proposed in or near Sites of Special Scientific Interest or which would harm the quiet enjoyment of Areas of Outstanding Natural Beauty. Proposals for noise sensitive developments should have regard to the following:

a) existing sources of noise e.g. from roads, railways and other forms of transport, industrial and commercial developments, sporting, recreation and leisure facilities; and

b) the need for appropriate sound insulation measures; and

c) the noise exposure levels outlined in Annex 1 of PPG24. In the context of this policy noise sensitive uses are housing, schools and hospitals.

The latest noise guidance will be adopted to ensure that the most up-to-date standards and methodologies are applied in the assessment process. While the guidance document reference in the local noise plan (PPG24) remains relevant, it is considered outdated in comparison to the current noise guidance. Therefore, by adopting the latest noise guidance, the assessment will align with contemporary best practices and ensure that noise impacts are evaluated comprehensively and accurately according to the most current standards and regulations.

Details of the latest guidance for new build residential development have been provided in the following sections.

3.2 ProPG: Planning & Noise

The Professional Practice Guidance on Planning & Noise (Institute of Acoustics (IOA), Association of Noise Consultants (ANC) and Chartered Institute of Environmental Health (CIEH), 2017) [1] for New Residential Development was produced to provide practitioners with guidance on a recommended approach to the management of noise within the planning system in England.

The ProPG acknowledges and reflects the Government's overarching Noise Policy Statement for England (NPSE), the National Planning Policy Framework (NPPF) and the associated planning practice guidance on Noise, as well as other authoritative sources of guidance.

The two sequential stages of the overall approach are:

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

Where sites are deemed to be "negligible" risk under Stage 1, there would not normally be a need for a Stage 2 assessment.

The four key elements to be undertaken in parallel during Stage 2 of the recommended approach are:

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

ProPG recommends that the details of the assessment(s) are presented in an Acoustic Design Statement (ADS). An ADS should not be necessary for a site assessed as negligible risk.

Stage 1: Initial Site Noise Risk Assessment

The noise risk assessment is intended to provide an indication of the likely risk of adverse effects from noise without any measures in place. It may be based on measurement or prediction (or a combination) as appropriate and should aim to describe noise levels over a "typical worst case" 24-hour day either now or in the foreseeable future.

The noise risk assessment categories are presented in Figure 1 of the ProPG, which is reproduced in Table 3.1 below. It illustrates how an initial noise risk assessment is linked with an increasing risk of adverse effect from noise, and how this in turn is broadly associated with indicative noise levels derived from current guidance and experience.

The indicative noise levels are intended to provide a sense of the noise challenge at a potential residential development site. Whilst it is noted that they "…should be interpreted flexibly having regard to the locality, the project and the wider context…", there is considered to be no need to amend them for the purposes of this assessment.

In the final column, the initial noise risk assessment is aligned with pre-planning application guidance that highlights the increasing importance of good acoustic design as the noise risk increases.

Table 3.1: Stage 1 initial site noise risk assessment (as per ProPG Figure 1)

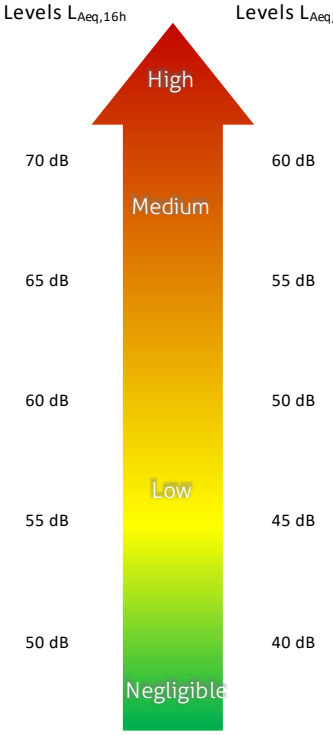
Noise risk assessment	Potential effect without noise mitigation	Pre-planning application advice
Indicative Daytime Noise Levels $L_{Aeq,16h}$ / Indicative Night-time Noise Levels $L_{Aeq,8h}$  	Increasing risk of adverse effect	High noise levels indicate that there is an increased risk that development may be refused on noise grounds. This risk may be reduced by following a good acoustic design process that is demonstrated in a detailed ADS. Applicants are strongly advised to seek expert advice. As noise levels increase, the site is likely to be less suitable from a noise perspective and any subsequent application may be refused unless a good acoustic design process is followed and is demonstrated in an ADS which confirms how the adverse impacts of noise will be mitigated and minimised, and which clearly demonstrate that a significant adverse noise impact will be avoided in the finished development. At low noise levels, the site is likely to be acceptable from a noise perspective provided that a good acoustic design process is followed and is demonstrated in an ADS which confirms how the adverse impacts of noise will be mitigated and minimised in the finished development.
	No adverse effect	These noise levels indicate that the development site is likely to be acceptable from a noise perspective, and the application need not normally be delayed on noise grounds.

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. $L_{Aeq,16h}$ is for daytime 0700 – 2300, $L_{Aeq,8h}$ 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.

ProPG states that "*It is important that the assessment of noise risk at a proposed residential development site is not the basis for the eventual recommendation to the decision maker*". Though, presumably, this would be acceptable for sites/noise levels deemed negligible risk (when a Stage 2 assessment or ADS would not normally be required).

It is noted that the categories (negligible, low, medium and high) do not necessarily correspond with a given threshold. This is perhaps understandable since these may vary in practice due to various acoustic and non-acoustic factors (which may vary from site to site); however, it is not helpful when it comes to consistently determining the degree of risk.

To determine thresholds for this purpose, it is logical in the first instance to take from the table above that 50 dB and 40 dB represent the thresholds between negligible and low for the day and night-time periods respectively. As discussed subsequently, the daytime level of 50 dB is the bottom of the criteria range applied to external amenity areas, whilst the equivalent level inside a dwelling based on a window being partially open (providing 10-15 dB reduction) would be 35-40 dB, which is in keeping with the relevant criteria, also discussed subsequently. The same is broadly the case in terms of the night-time period; although, since the day and night internal criteria are only 5 dB apart (shown later), and the external thresholds are 10 dB apart, the external night threshold is more stringent relative to the daytime equivalent.

Applying a banding of 10 dB results in the following thresholds in Table 3.2, which correspond well with the table above.

Table 3.2: Interpretation of the Level 1 initial site noise risk assessment thresholds

Noise risk category	$L_{Aeq,16h}$ (07-23)	$L_{Aeq,8h}$ (23-07)	L_{AFmax} (23-07)	Level 2 assessment?	Pre-planning application advice
High	> 70 dB	> 60 dB	> 10 events > 60 dB	Required	"…an increased risk that development may be refused on noise grounds. This risk may be reduced by following a good acoustic design process…"
Medium	61 – 70 dB	51 – 60 dB			"…application may be refused unless a good acoustic design process is followed and is demonstrated… how the adverse impacts of noise will be mitigated and minimised, and… a significant adverse noise impact will be avoided…"
Low	51 – 60 dB	41 – 50 dB			"…the site is likely to be acceptable from a noise perspective provided that a good acoustic design process is followed…"
Negligible	≤ 50 dB	≤ 40 dB	Less than the above	Not normally required	"…the development site is likely to be acceptable from a noise perspective, and the application need not normally be delayed on noise grounds."

As noted above, the rating or categorisation at this stage is not to be taken as the final word on the site, but rather an initial guide as to the degree of measures likely to be required to achieve an acceptable development.

In achieving 'Good Acoustic Design' ProPG states: *"Designing the site layout and the dwellings so that the internal target levels can be achieved with open windows in as many properties as possible demonstrates good acoustic design. 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 states that *"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."*

Stage 2: Full Assessment

The requirements of the Stage 2: Full Assessment are covered in Section 6 of this report.

3.3 Acoustics, Ventilation and Overheating Guide

The Acoustics, Ventilation and Overheating Residential Design Guide (AVO Guide) [2] (Association of Noise Consultants (ANC) and Institute of Acoustics (IOA), 2020) has been prepared with contributions from members of the Association of Noise Consultants' (ANC) Acoustics, Ventilation and Overheating (AVO) Group. As stated in the Introduction to the AVO Guide, "*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. Application of the AVO Guide is intended to demonstrate good acoustic design as described in the ProPG: Planning & Noise, May 2017 ('ProPG'), when considering internal noise level guidelines.*" Whilst, "*Provisions for both ventilation and mitigation of overheating may include façade openings that permit external noise ingress, and/or mechanical equipment that generates noise. In both cases, there is potential for noise impact.*"

The scope is further clarified as, "*…for the consideration of new residential development that will be exposed predominantly to airborne sound from transport sources, and to sound from mechanical services that are serving the dwelling in question. Other sources of noise, such as noise from industrial, commercial or entertainment premises, and of ground-borne noise and vibration, are outside the scope of the AVO Guide. New apartments, flats and houses are the most common type of new residential development. The approach may also be used for other types of residential development such as residential institutions, care homes etc, although it needs to be remembered that some of the occupants of these types of premises can be more sensitive to indoor environmental conditions.*"

Whilst "*The contribution to internal noise levels from transport sources and from mechanical services are considered separately and independently, because there is evidence that occupants have a different tolerance to each.*"

Despite detailed assessments of the inherently linked acoustics, ventilation and overheating fields may not be required at the early stages of the design of a development; the principles relating to the key aspects that will need careful attention later on have been used to assess potential impacts on areas of the site that may present mitigation challenges to achieve suitable conditions within dwellings on the above 3 fields.

External and Internal Ambient Noise Levels due to Transport Noise Sources

The AVO Guide notes that "*the over-arching aspiration of good acoustic design is that residents may open windows without any adverse acoustic impact (ProPG paragraph 2.33); where a site layout achieves these conditions, the portion of the AVO Guide relating to environmental noise is not applicable.*" Whilst, "*Good acoustic design may be considered as a component of sustainable design. Other aspects of sustainable design include a response to climate change, in terms of aiming to minimise use of energy and other resources.*"

It is also noted, "*There are other benefits for occupants from opening windows, such as the connection with the outside, sense of fresh air, experience of draughts when overheating, and sense of control over one's environment. Consideration of these factors is also beyond the scope of the AVO Guide.*"

The AVO Guide highlights that in the context of sustainable development, good practice should be adopted to minimise noise levels within dwellings with windows open as far as practicable.

The following three key statements are quoted from ProPG:

- "*…special care must be taken to design the accommodation so that it provides good standards of acoustics, ventilation and thermal comfort without unduly compromising other aspects of the living environment. In such circumstances, internal noise levels can be assessed with windows closed but with any façade openings used to provide "whole dwelling ventilation" in accordance with Building Regulations Approved Document F (e.g. trickle ventilators).*"

- "*It should also be noted that the internal noise level guidelines are generally not applicable under "purge ventilation" conditions as defined by Building Regulations Approved Document F* (HM Government, 2013)*, as this should only occur occasionally (e.g. to remove odour from painting and decorating or from burnt food).*"

- "*In addition to providing purge ventilation, open windows can also be used to mitigate overheating. Therefore, should the LPA accept a scheme is to be assessed with windows closed, but this scheme is reliant on open windows to mitigate overheating, it is also necessary to consider the potential noise impact during the overheating condition. In this case a more detailed assessment of the potential impact on occupants should be provided in the ADS* [Acoustic Design Statement]."

In other words, there is no requirement to assess external noise ingress during purge ventilation, but there is during whole dwelling ventilation (usually with windows closed but trickle vents open, and referred to as the

'ADF ventilation condition') and the provision of ventilative cooling (usually with windows open, and referred to as the 'overheating condition'). With the first condition being essentially a constant requirement, and the second an occasional requirement, subject to various factors associated with internal heat generation, hence different noise criteria are deemed to apply.

Like the ProPG two-stage assessment approach, the AVO Guide also provides Levels 1 and 2 overheating assessments to determine potential areas of noise impact risks in residential developments. The Level 1 site risk assessment is performed by comparing the relevant ambient noise levels for the site/representative location of the key dwellings (as measured or otherwise determined) with Table 3.2 of the AVO Guide, as reproduced in Table 3.3 below.

Table 3.3: Guidance for Level 1 site risk assessment of noise from transport noise sources [NOTE 1] relating to overheating condition (as per AVO Guide Table 3-2)

Risk category for Level 1 assessment [NOTE 5]	Potential Effect without Mitigation	Recommendation for Level 2 assessment
$L_{Aeq,T}$ [NOTE 3] during 07-23 / $L_{Aeq,8h}$ during 23-07 High: 65 dB / 55 dB Medium: 60 dB / 50 dB Low: 55 dB / 50 dB Negligible: 50 dB / 45 dB	Increasing risk of adverse effect	Recommended Optional
	Use of opening windows as primary means of mitigating overheating is not likely to result in adverse effect	Not required

Note 1 The noise levels suggested assume a steady road traffic noise source but may be adapted for other types of transport. All levels are external free-field noise levels.
Note 2 The values presented in this table should not be regarded as fixed thresholds and reference can also be made to relevant dose-response relationships.
Note 3 A decision must be made regarding the appropriate averaging period to use. The averaging period should reflect the nature of the noise source, the occupancy profile and times at which overheating might be likely to occur.
Note 4 Where 78 dB L_{AFmax} is normally exceeded during the night-time period (23:00-07:00), a Level 2 assessment is recommended.
Note 5 The risk of an adverse effect occurring will also depend on how frequently and for what duration the overheating condition occurs. Refer to ProPG's Figure 3-2.
Note 6 To evaluate the risk category for a dwelling, all three aspects of external noise exposure (i.e. daytime, night-time and individual noise events) should be evaluated. The highest risk category for any of the three aspects applies.

It is noted that, again, the categories (negligible, low, medium and high) do not necessarily correspond with a given threshold. These can be established, however, with help from the explanatory notes given in the AVO Guide (Section 3). A core factor is the assumption that the level difference between outside and inside conditions with a window open for ventilative cooling is 13 dB, and that a Level 2 assessment is not required if "reasonable" internal conditions are achieved, which are taken to be the BS 8233:2014 [3] criteria relaxed by 5 dB. For the most noise-sensitive spaces of living rooms and bedrooms, therefore, the thresholds are 53 dB (i.e. 35+5+13) and 48 dB (i.e. 30+5+13) for the daytime and night-time periods, respectively. Applying a banding of 5 dB results in the following thresholds shown in Table 3.4, which correspond well with the table above.

Table 3.4: Interpretation of the Level 1 site risk assessment noise thresholds relating to overheating condition

Risk category for Level 1 assessment	$L_{Aeq,16h}$ (07-23 hours)	$L_{Aeq,8h}$ (23-07 hours)	Level 2 assessment?	L_{AFmax} (23-07 hours)
High	> 63 dB	> 58 dB	Recommended	> 78 dB ("normally exceeded")
Medium	59 – 63 dB	54 – 58 dB	Optional/Recommended	n/a
Low	54 – 58 dB	49 – 53 dB	Optional	n/a
Negligible	≤ 53 dB	≤ 48 dB	Not required	n/a

3.4 British Standard 8233

British Standard BS 8233: 2014 provides guideline values for internal noise levels within a number of building types including residential dwellings. In general, for steady external noise sources, it is desirable that the internal ambient noise level does not exceed the guideline values in Table 3.5:

Table 3.5: British Standard 8233 Indoor Noise Levels

Activity	Location	Daytime	Night-time
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 $L_{Aeq, 8hour}$

Notes: Daytime assessment period – 07:00 to 23:00 hrs
Night-time assessment period – 23:00 to 07:00 hrs

Furthermore, the Standard notes that, "*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.*" No thresholds/criteria are provided within the standard, however.

The previous, 1999 version of the Standard included the note that, "*For a reasonable standard in bedrooms at night, individual noise events (measured with F time-weighting) should not normally exceed 45 dB $L_{Amax,F}$.*".

This is the same threshold (i.e. 45 dB) given in the World Health Organization (WHO) Guidelines for Community Noise [4], and it is, therefore, considered to remain relevant and is described in the following sub-section.

In respect of external noise levels, the guidance in BS 8233:2014 suggests that "*it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$, with an upper guideline value of 55dB $L_{Aeq,T}$ which would be acceptable in noisier environments*". BS 8233:2014 however acknowledges that "*these guideline values are not achievable in all circumstances where development might be desirable*", and that "*…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*".

In respect of balconies, roof gardens and terraces, BS 8233:2014 states that "*In these locations, specification of noise limits is not necessarily appropriate. Small balconies may be included for uses such as drying, washing or growing pot plants, and noise limits should not be necessary for these uses; however, the general guidance on noise in amenity space is still appropriate for larger balconies, roof gardens and terraces, which might be intended to be used for relaxation. In high-noise areas, consideration should be given to protecting these areas by screening or building design to achieve the lowest practicable levels. Achieving levels of 55 dB $L_{Aeq,T}$ or less might not be possible at the outer edge of these areas but should be achievable in some areas of the space*".

BS 8233:2014 suggests that proposed development within noisy environments should be designed to ensure that the recommended internal design standards are achieved, and that noise levels in external amenity areas are designed to effectively control and reduce noise levels; although it acknowledges that in certain circumstances meeting the external design recommendations may not be feasible, or necessary, especially where the provision of such spaces is desirable for other technical, planning or policy reasons.

3.5 World Health Organisation Guidelines

The following guideline values for community ambient noise levels in specific environments are presented in the World Health Organization (WHO) Guidelines for Community Noise.

Table 3.6: WHO Guideline Noise Values

Specific Environment	Critical Health Effect(s)	dB $L_{Aeq,T}$	Time Base hours	dB $L_{Amax,F}$
Dwelling indoors	Speech intelligibility and moderate annoyance, daytime and evening	35	16	-
Inside bedrooms	Sleep disturbance, night-time	30	8	45

The 45 dB $L_{Amax,F}$ criterion applies to "single sound events" within bedrooms at night. This guideline is generally interpreted as the value that individual noise events should not normally exceed more than 10 times a night.

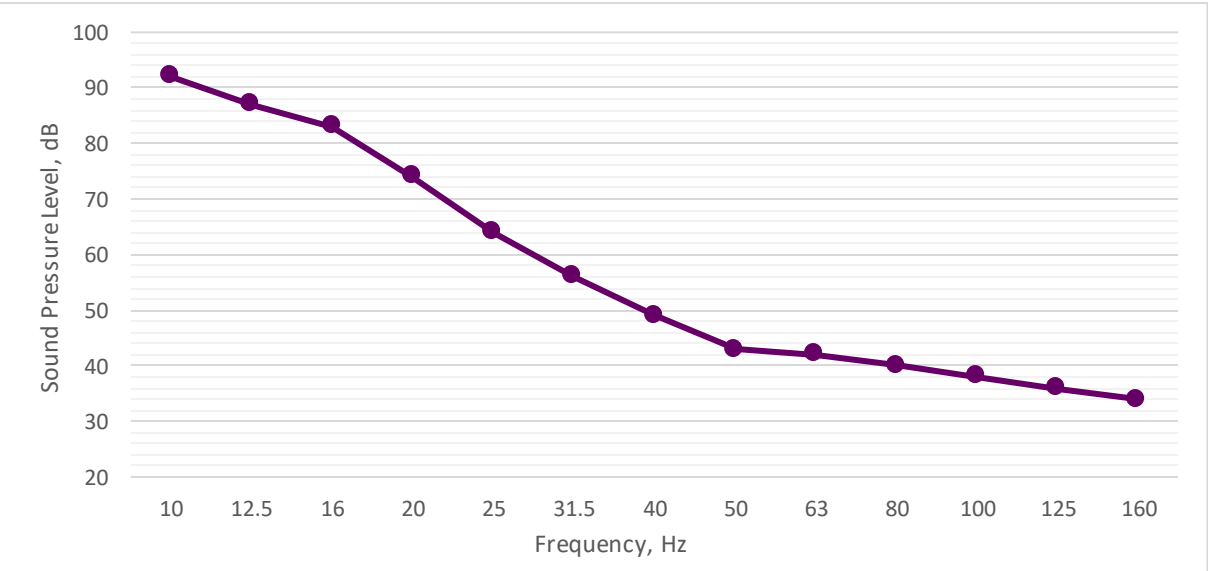
3.6 Procedure for the Assessment of Low Frequency Noise Disturbance (NANR45)

The University of Salford produced a report in 2005, which was then revised in 2011, providing criteria for the assessment of low frequency noise disturbance within dwellings, following years of research on the subject and mirroring some European countries criteria.

The NANR45 report describes a method for assessing low frequency sound in dwellings, but it does not necessary provide an indicator of nuisance. The assessment is based on whether the sound levels in question, as determined inside the property, exceed a reference curve, as per the following table and figure.

Table 3.7: NANR45 Reference Curve

Hz	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160
dB, L_{eq}	92	87	83	74	64	56	49	43	42	40	38	36	34



The NAN45 report goes on to state that if the noise occurs only during the day then 5dB relaxation may *be applied to all third octave bands*.

If the noise is steady then a 5dB relaxation may be applied to all third octave bands. A noise is considered steady if either of the conditions a. or b. below is met:

a. L_{10}-L_{90} *< 5dB*
b. the rate of change of sound pressure level (Fast time weighting) is less than 10dB per second

where the parameters are evaluated in the third octave band which exceeds the reference curve values (Table 9) by the greatest margin.

3.7 Summary of Adopted Criteria

The ProPG and AVO Guide have been considered in this assessment, in line with national planning guidance to determine suitable noise criteria for the development. For road and rail sources, it is considered that BS 8233 levels detailed in Section 3.4 of this report should apply, in line with WHO Night Noise Guidance and ProPG L_{AFmax} criterion. For entertainment noise sources, the NANR45 reference curve described in Section 3.6 has been applied.

4 BASELINE NOISE CONDITIONS

4.1 Noise Survey results – Environmental Noise

As mentioned in the introduction, noise measurement results undertaken previously, in the Stuart Michael Associates report *(Report Ref: 6377/NA dated Sept 2023)* will be used and is reported on therein. The noise data captured for the previous survey is still considered relevant as it was undertaken recently and has therefore been used to form part of this assessment. Results from this survey can be found in Section 4 of the Stuart Micheal Associates report. This survey mainly focused on road traffic noise and will be used to assess the impact of road traffic noise across the development.

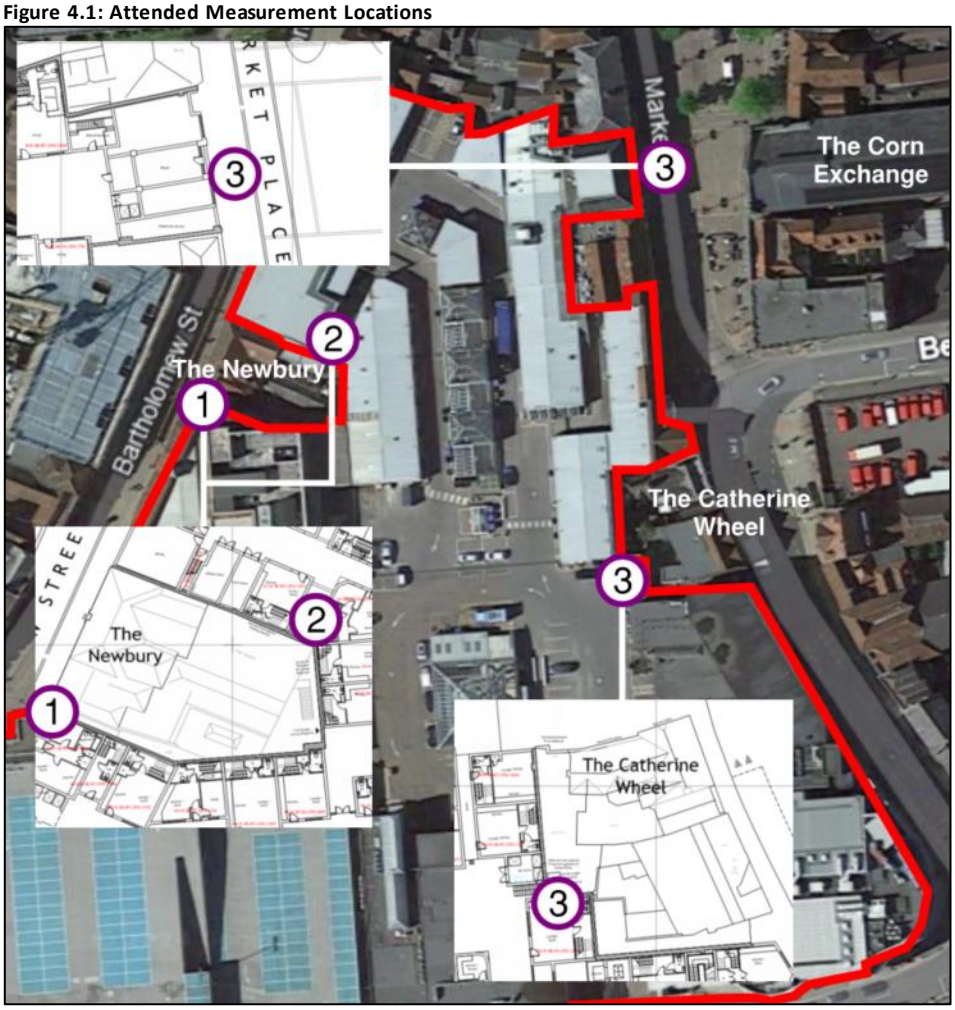
4.2 Noise Survey results – Entertainment Noise

Anderson Acoustics visited the site between the hours of 19:00 and 23:00 on Friday 24th November 2023 to undertake attended noise measurements.

Following a site walk around, four measurement locations were selected as appropriate to capture the key sources of entertainment noise incident on the proposed residential element of the development.

Figure 4.1 shows these locations on a site map (existing) and overlays the equivalent location in the future development scenario.

Figure 4.1: Attended Measurement Locations



All acoustic measurement equipment used during the noise survey conformed to Class 1 specification of British Standard 61672. A full inventory of this equipment is shown in Table 3.1 below. All equipment's calibration certificates are available on request.

Table 4.1: Equipment details

Equipment	Make & Model	Serial No	Calibration Due
Class 1 Sound Level Meter	Svantek SV 971A	131627	06/03/2025*
Calibrator	Svantek SV 36	112518	29/08/2024*

*Certificates are appended to this document

The equipment was calibrated before and after the survey with no significant drift observed.

Weather conditions during the survey were considered favourable for noise measurements, being dry with light winds.

4.3 Results

Table 4.2 below shows the results of the 9 measurements carried out at the 4 attended positions shown in Figure 4.1. For each measurement position, the $L_{Aeq,15min}$ and L_{AFmax} levels have been obtained under free-field conditions.

Table 4.2: Attended Survey Results, dB

Ref	Position	Start Time	$L_{Aeq,15min}$	L_{AFmax}	Description of Noise Environment
1	Location 3 - Rear of The Catherine Wheel at first floor level	19:01	57	77	• Measurement dominated by plant noise from property to the north (dominant noise source) • Chatter emanating from the 1st floor window of the pub – kitchen/staff area. • Conversation noise from pub smoking area • Car/motorbike pass-bys (likely L_{max} noise event)
2	Location 2 - Rear of the Newbury at first floor level	19:19	62	82	• Measurement dominated by conversations occurring in the smoking area • Constant background hum from plant located behind the smoking area.
3	Location 3 - Ground floor opposing The Corn Exchange	19:49	51	67	• Minimal plant noise from rooftop plant units • Infrequent road traffic noise • Light pedestrian conversation
4	Location 1 - Ground floor outside the Newbury	20:49	66	79	• Measurement dominated by road traffic noise • Patrons staffing outside the pub having conversations. • Music from within the pub is audible but not dominant

Ref	Position	Start Time	$L_{Aeq,15min}$	L_{AFmax}	Description of Noise Environment
5	Location 2 - Rear of the Newbury at first floor level	21:11	79	88	• Measurement dominated by live band. • Patrons having conversations in the smoking area • Plant is not audible due to live band music
6	Location 3 - Rear of The Catherine Wheel at first floor level	21:29	58	67	• Measurement still dominated by plant noise from property to the north (dominant noise source) • Conversations between patrons within from pub smoking area
7	Location 3 - Ground floor opposing The Corn Exchange	21:53	65	79	• Conversations between pedestrians • Light road traffic noise – occasional built up of traffic noise due to nearby traffic lights • Conversations between patrons within the Hatchet Inn smoking area
8	Location 2 - Rear of the Newbury at first floor level	22:13	81	89	• Measurement dominated by live band (likely source of L_{max} event)
9	Location 3 - Rear of The Catherine Wheel at first floor level	22:33	59	68	• Conversations between patrons within from pub smoking area • Plant from earlier measurement is no longer audible. • Background music from pub is audible • Live band music from the Newbury is audible

4.4 Discussion of Results

During the survey The Newbury was hosting a live band within their semi enclosed rooftop terrace to the rear of the building, shown in Figures 4.2 and 4.3 below:

Figure 4.2: Semi-enclosed events space

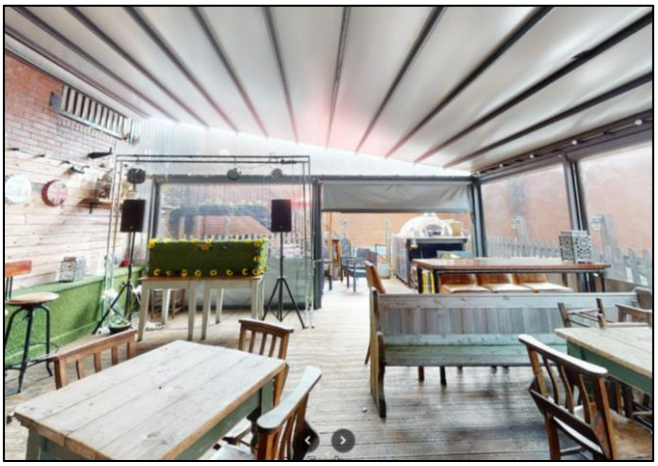


Figure 4.3: Semi-enclosed events space (during measurement, view from measurement position)

Considering the event space location and the noise levels recorded at the rear of The Newbury, the amenity of the proposed apartments overlooking the rooftop terrace will be adversely impacted unless suitable mitigation measures are implemented. This is considered further in Section 6.2.3.

In this location noise levels of 66$L_{Aeq,15min}$ were captured when entertainment noise was not in operation, however this level increased to between 79 and 81 $L_{Aeq,15min}$ when the entertainment noise started.

It is understood that the Newbury hosts evening events within the rooftop terrace on Friday and Saturday evenings and occasionally during the week. It is understood that events may take place in the afternoons during the summer period and that live music is not played after 23:00.

Noise levels captured from The Catherine Wheel ranged from 56 to 59dB $L_{Aeq,15min,}$ with an L_{Amax} of around 67 to 77dB – caused by pedestrians talking within close proximity of the measurement position. It should be noted that The Catherine Wheel has a beer garden to the rear, which was not busy during our survey. During warmer periods of the year, this area is likely to get busy and therefore may adversely impact the amenity of the nearby proposed apartments of the development (eastern facades of apartments located at the eastern boundary).

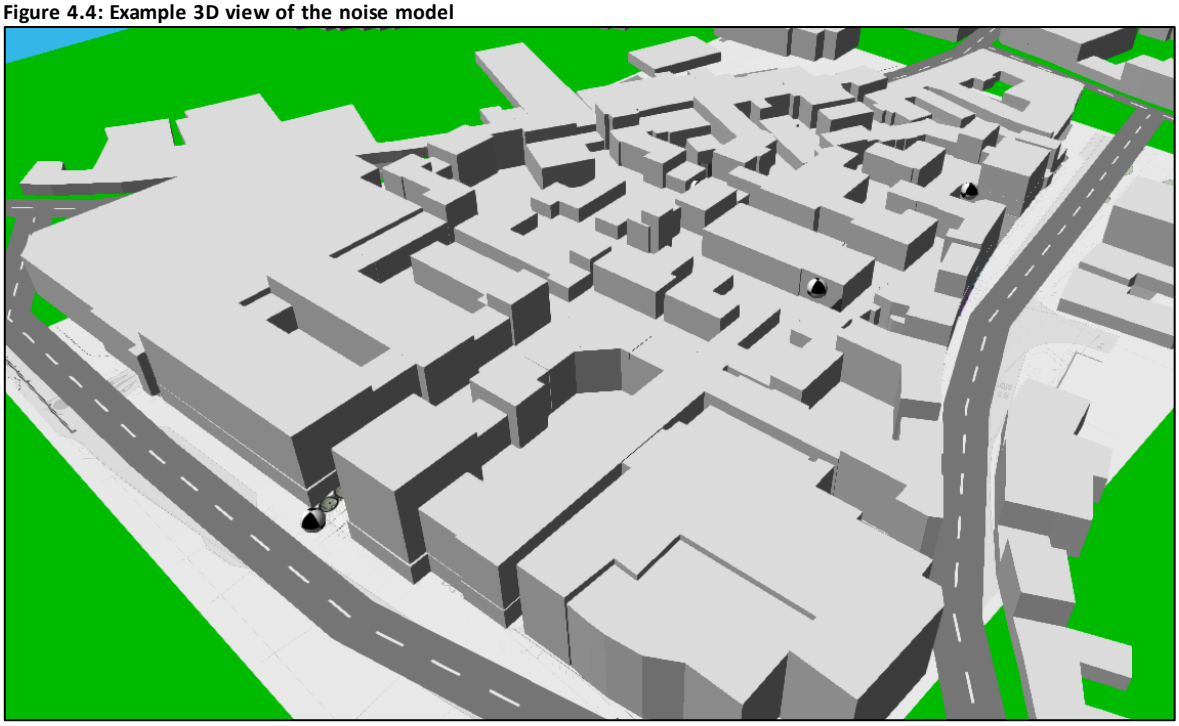
A patron noise assessment has been included to account for the activity noise arising from The Catherine Wheel's beer garden, this is presented in Section 6.2.4 of this report. The purpose of this assessment is to determine noise levels affecting the proposed development, when the beer garden experiences increased activity, such as during the warmer summer months.

Regarding the noise emanating from The Corn Exchange, worst case noise levels of around 65dB $L_{Aeq,15min}$ and 79dB L_{Amax} were captured and comprised road traffic noise and conversations among pedestrians nearby. A performance of Beauty and the Beast was occurring at The Corn Exchange during the survey and no breakout noise could be heard.

4.5 Noise Modelling

In order to predict the impact of road noise and entertainment noise exposed across the development, the baseline noise measurements discussed in the sections above were used to produce a detailed 3D noise model, which was calibrated to match the measured levels summarised above.

Figure 4.4: Example 3D view of the noise model



The predictions were carried out using the noise-modelling suite Cadna/A 2021, in accordance with the CRTN, CRN and ISO 9613 prediction methodologies, which allow consideration of the effects of the acoustic screening provided by both existing buildings surrounding the site and buildings of the development itself.

The results of the noise modelling were used to determine the likely noise levels incident on each building across the completed site. These predictions have formed the basis of the mitigation proposals.

In addition to the road source noise levels used in the predictions, the model considers the effects of the topographical conditions throughout the area, ground absorption, atmospheric absorption, acoustic reflections and acoustic screening, as well as applying a light downwind propagation correction to represent a worst-case.

The model was used to determine typical worst-case daytime (07:00 - 23:00) and night-time (23:00 to 07:00) L_{Aeq} and $L_{Amax,F}$ noise levels across the site due to road traffic noise. It has also be used to determine typical worst-case $L_{Aeq,T}$ noise levels at various façade locations around the site that will be impacted by entertainment noise.

5 PRO PG – STAGE 1: INITIAL SITE NOISE RISK ASSESSMENT

An initial site noise risk assessment has been undertaken in line with the proposed criteria detailed in Table 3.1. Daytime and night-time noise contours for the proposed site are presented in Figures 5.1 and 5.2 below.

Figure 5.1: Initial daytime site noise risk assessment ($L_{Aeq,16hour}$ road traffic noise contours predicted at 4.5 metres above ground level)

Figure 5.2: Initial night-time site noise risk assessment ($L_{Aeq,8hour}$ road traffic noise contours predicted at 4.5 metres above ground level)

Figure 5.1 and Figure 5.2 show the predicted noise contours across the site with the proposed development. Noise contours have been calculated at a height of 4.5 m above ground level, representing a first-floor window.

ProPG notes that in 'Low and Medium Risk' categories, it should be demonstrated that a "good acoustic design process" is detailed and that an "Acoustic Design statement can demonstrate the adverse noise risk can be mitigated and minimised". ProPG's guidance focuses on road traffic noise as the primary noise risk, thus entertainment noise will be evaluated separately using criteria considered more relevant.

6 PRO PG – STAGE 2: ACOUSTIC DESIGN STATEMENT

6.1 Element 1: Good Acoustic Design

Following a good acoustic design process is implicit to achieving good overall design, as required by the Government's planning and noise policy documents NPSE and NPPF.

This process requires a high level, multi-faceted and integrated approach across all disciplines with a view to optimising acoustic conditions inside habitable rooms and in external amenity spaces.

Section 5 of BS 8233: 2014 contains guidance on the sequence of stages to be followed in the planning and early acoustic design of a new development. Section 5.4 of BS 8233:2014 outlines a general approach to determining appropriate noise control measures including the following suggested steps (which may be iterative):

i. Check the feasibility of reducing noise levels and/or relocating noise sources.
ii. Consider options for planning the site or building layout.
iii. Consider the orientation of proposed building(s).
iv. Select construction types and methods for meeting building performance requirements.
v. Examine the effects of noise control measures on the requirements for ventilation, fire regulation, health and safety, cost, CDM (construction, design and management) etc.
vi. Assess the viability of alternative solutions.

The designer should then decide which of the following options can be applied to reduce noise levels:

i. Quietening or removing the source of noise.
ii. Attenuating the sound on its path to the receiver.
iii. Obstructing the sound path between source and receiver.
iv. Improving the sound insulation of the building envelope.
v. Using agreements to manage noise.

The main sources of noise affecting the proposed development is road traffic noise from the surrounding roads and entertainment noise from The Newbury's Roof Terrace venue to western boundary of the site. The measured road traffic noise levels across the development have been found to be generally moderate, with the façades closest to Marketplace and Cheap Street being the most exposed to the highest external noise levels.

Based on our attended noise survey detailed in Section 4.2, the facades in close proximity to the Newbury's roof terrace will likely be exposed to a significant level of entertainment noise. At the time of writing, it is understood that The Newbury operate from 11:30am to 10pm, Tuesday to Wednesday, 11:30am to 12am, Thursday to Friday, 12pm to 2am on Saturday and 11:30am to 5pm on Sunday. The frequency and duration of of the events taking place on the roof terrace are unknown, however it is understood that they can take place at least once a week during the evenings.

Where possible, bedrooms should be located away from the elevations directly onlooking the Newbury's roof terrace (which has currently been implemented). This aims to minimise potential impacts and reduce the number of rooms that may be affected in addition to reducing additional mitigation required to provide suitable internal noise, ventilation and thermal conditions within apartments. Further discussion on these elements is provided in Section 6.2.3.

The noise impact Catherine Wheel's beer garden has also been assessed (covered in Section 6.2.4).

6.2 Element 2: Internal Noise Level Guidelines

6.2.1 Assumptions

Drawings Used

The following drawings provided by Woods Hardwick Architects have been used in our assessment.

Table 6.1: Drawings used in assessment

Description	Drawing Number	Date
Proposed Basement Floor Plans	19401 1002	Feb 2024
Proposed Ground Floor Plan	19401 1003	Feb 2024
Proposed First Floor Plan	19401 1004	Feb 2024
Proposed Second Floor Plan	19401 1005	Feb 2024
Proposed Third Floor Plan	19401 1006	Feb 2024
Proposed Fourth Floor plan	19401 1007	Feb 2024
Proposed Fifth Floor Plan	19401 1008	Feb 2024
Proposed Sixth Floor Plan	19401 1009	Feb 2024
Combined Sketch Elevations	-	Feb 2024

Absorptive Finishes

Our calculations assume a typical reverberation time of 0.5 second in bedrooms and living rooms.

External Noise Levels

Predicted average noise levels at the façade due to road traffic are shown in Figures 6.1 (daytime $L_{Aeq,16hrs}$), 6.2 (night -time $L_{Aeq,8hrs}$), and 6.3 (night-time $L_{Amax,F}$). According to the predictions provided by the noise model, the worst affected rooms are likely to be the those onlooking Market Place and Cheap Street, which are expected to experience a maximum level of 65 dB $L_{Aeq,16hrs}$ during the day, and 54 dB $L_{Aeq,8hrs}$ and 74 dB $L_{Amax,F}$ at night.

Figure 6.4 shows the predicted worst-case average façade noise levels due to entertainment noise. It should be noted that:

- Only the façade levels across the affected areas have been included – most apartments of the development will be screened from entertainment noise due to the massing of the buildings.
- Only levels across facades that have glazed elements have been included.

The worst affected apartments/rooms are those towards the south-east of the Newbury, as they benefit from the least amount of acoustic screening. These facades may be expected to experience a maximum level of 65 dB $L_{Aeq,1hr}$ during the night-time period.

Given the two different types of dominant noise sources affecting the development, this assessment will be divided into sections that focus on mitigating the noise from the aforementioned sources, as they are stipulated by different criteria.

Figure 6.1: Predicted daytime $L_{Aeq,16hr}$ (daytime) due to road traffic noise (predictions are free field and indicate the highest level across all floors)

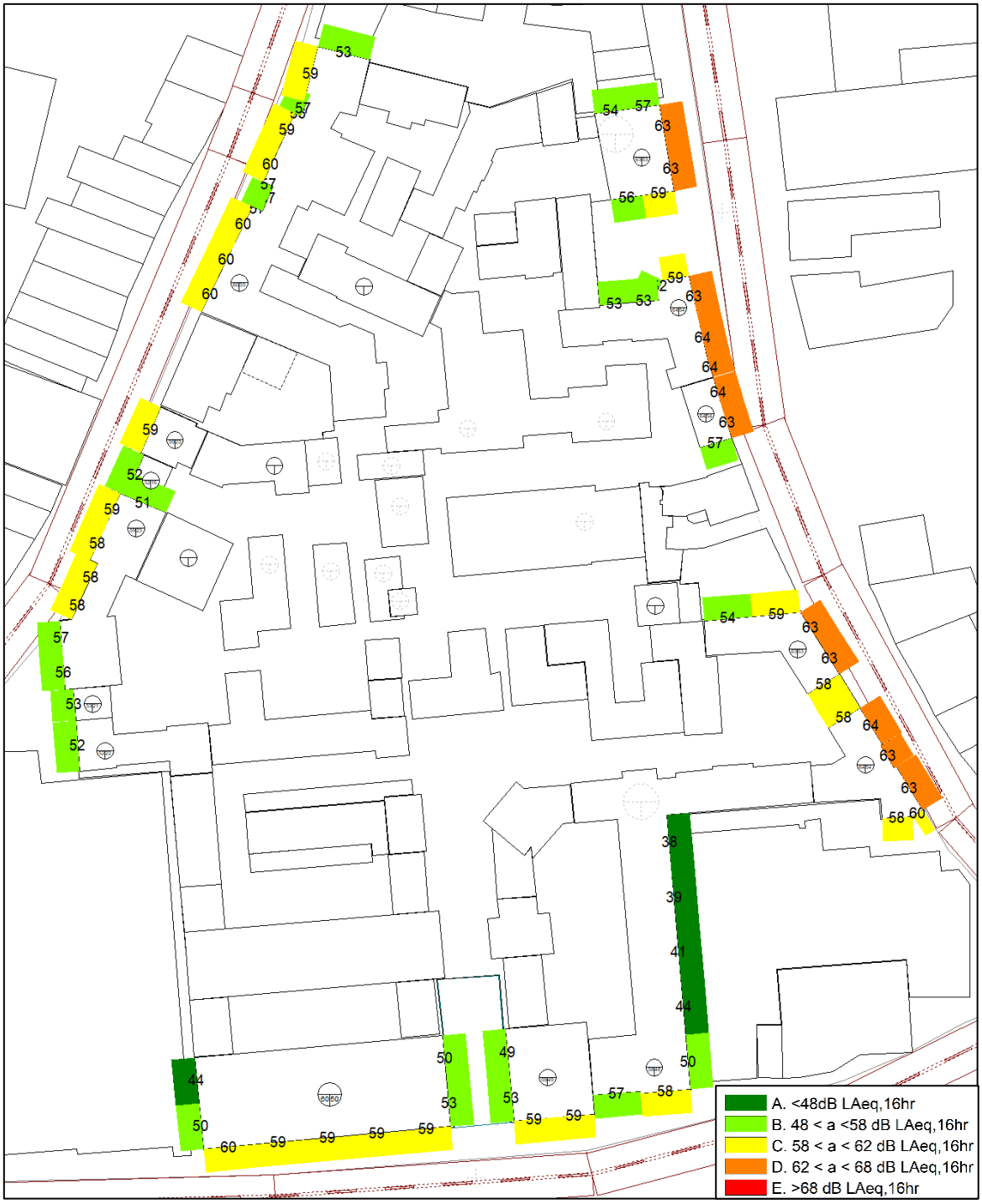


Figure 6.2: Predicted night-time $L_{Aeq,8hr}$ (night-time) due to road traffic noise (predictions are free field and indicate the highest level across all floors)

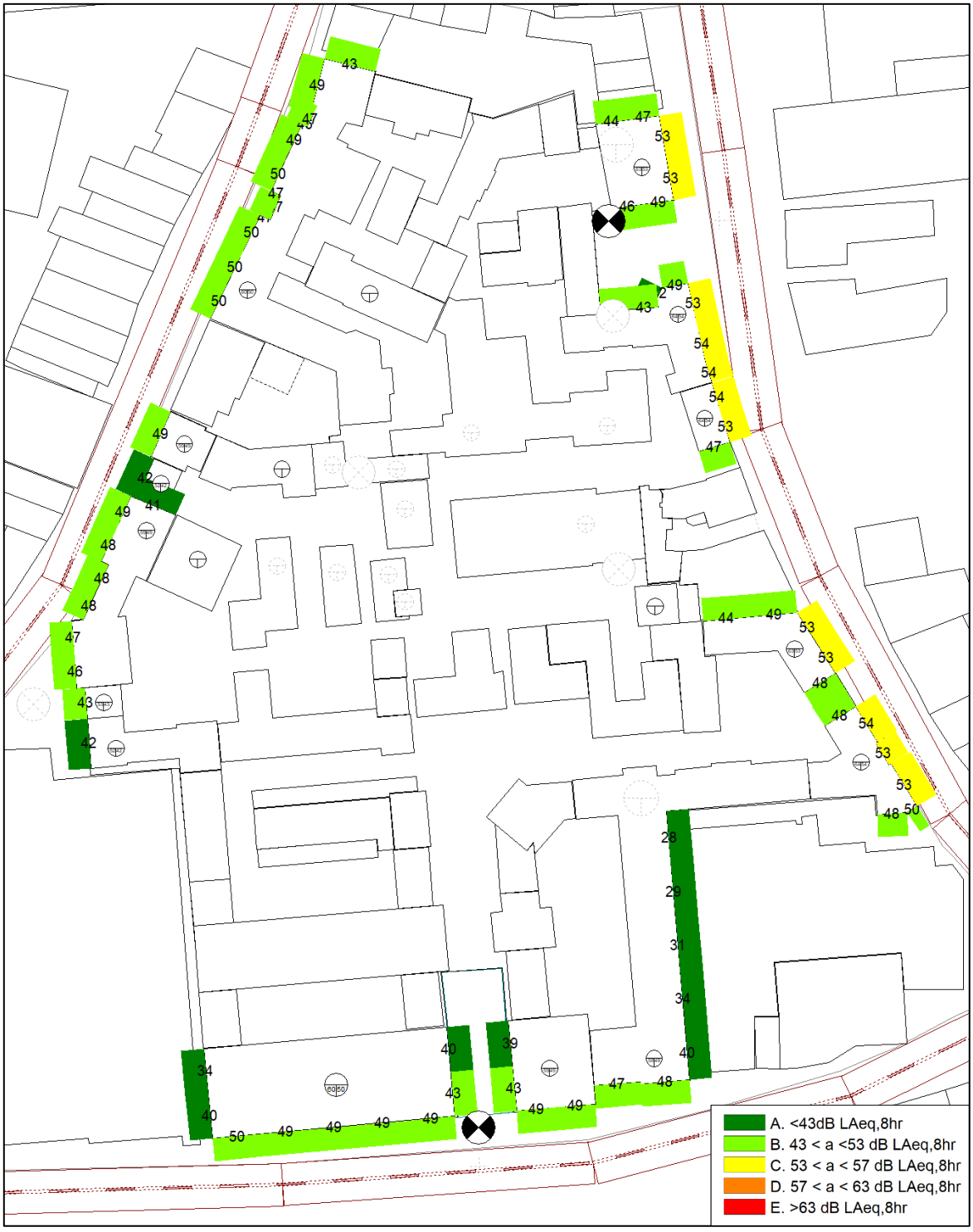
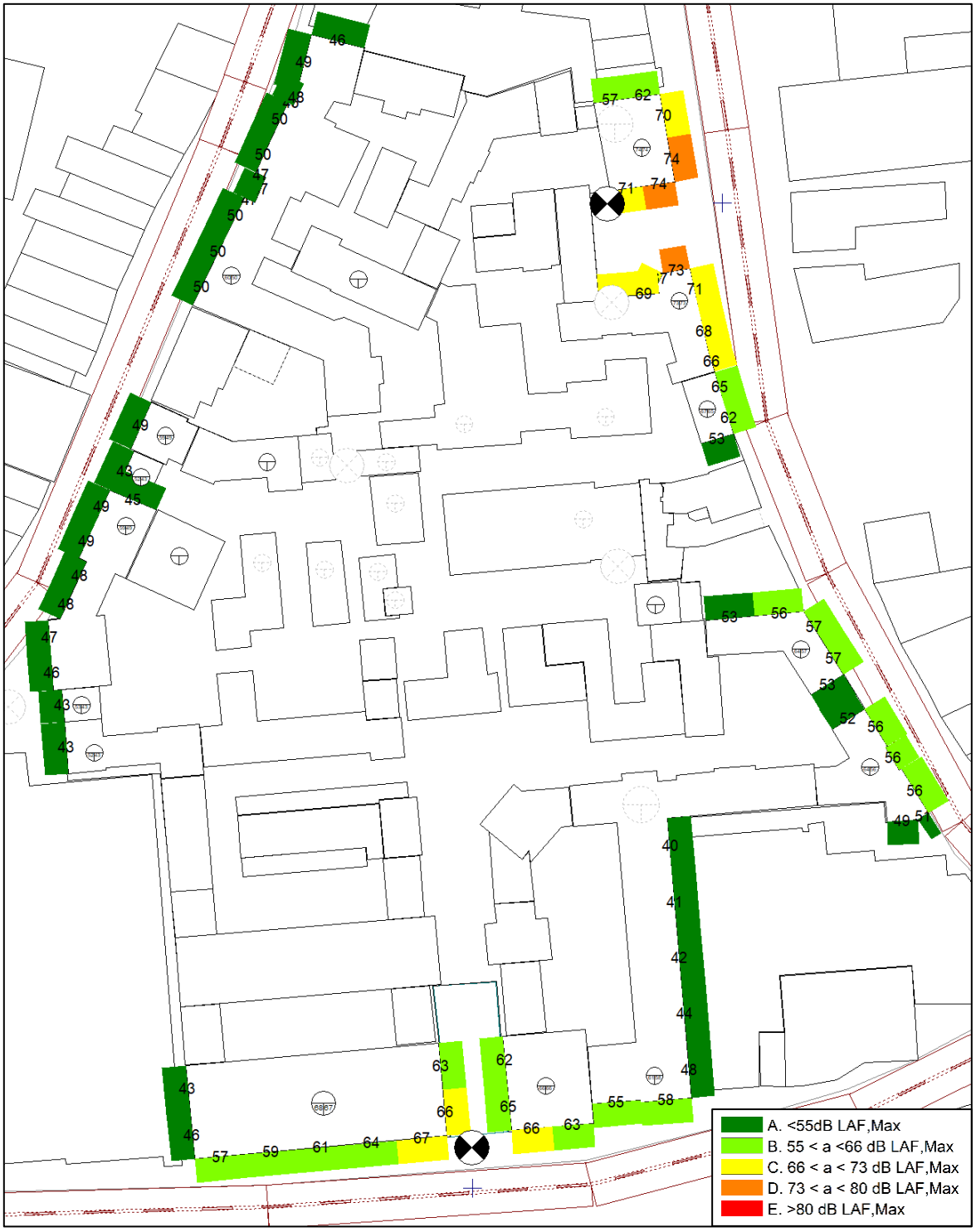
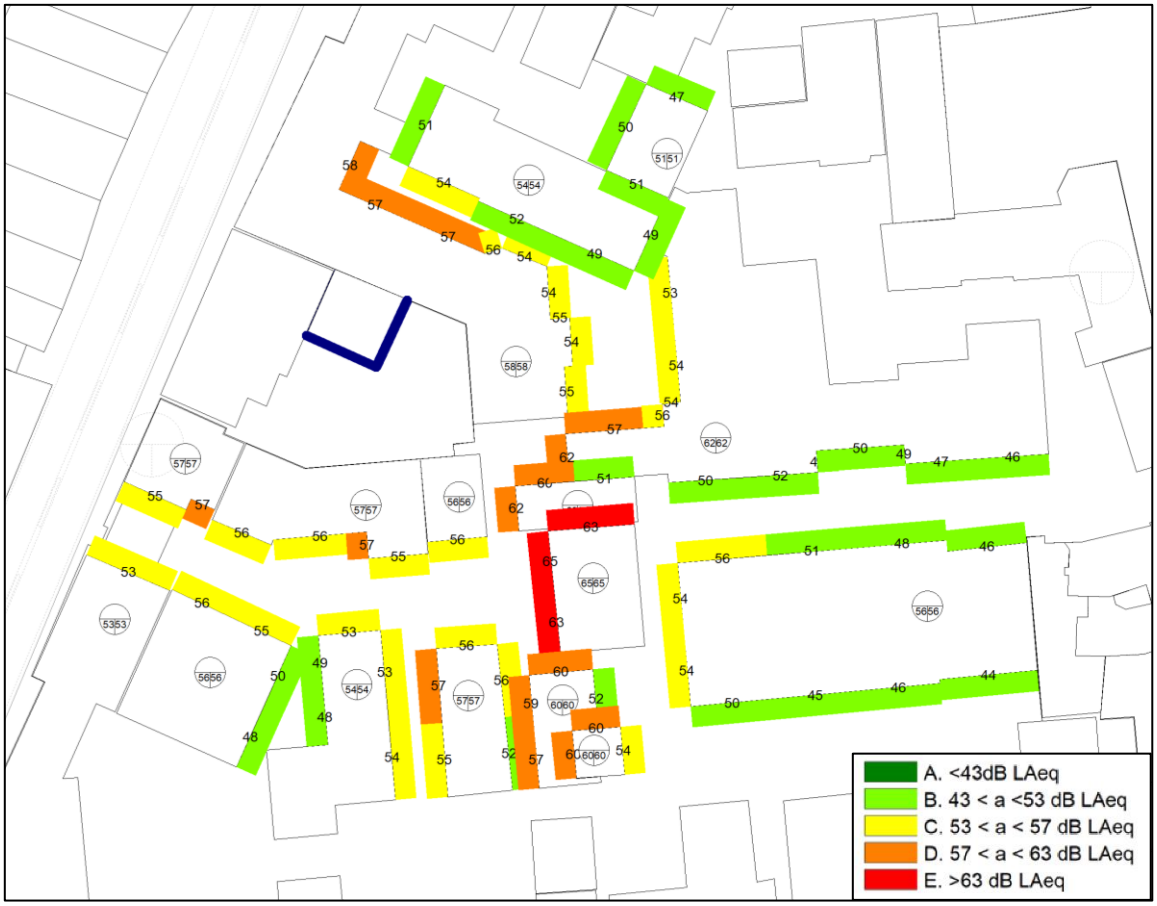


Figure 6.3: Predicted night-time $L_{AMax,F}$ (night-time) due to road traffic noise (predictions are free field and indicate the highest level across all floors)



It should be noted that L_{Amax} noise events at the façade have been represented by placing a point source on the road, simulating a vehicle related L_{Amax} event, as this was likely the source of the event.

Figure 6.4: Predicted night-time noise levels (L_{Aeq}) due to entertainment noise (predictions are free field and indicate the highest level across all floors)



External Wall Construction

It is understood that the external walls will be based on a brick-block cavity wall construction across the main part of the development. We would expect this construction to achieve the following minimum sound reduction performance, based on experience of similar wall constructions:

Table 6.2: Estimated sound reduction index (dB) of the external wall construction

Construction	125	250	500	1k	2k	4k	R_w / $R_w + C_{tr}$
Brick-block cavity wall	41	45	45	54	58	58	52 / 46

It should be noted that even if the external wall configurations differ from the above, this will not likely impact on the predicted internal ambient noise levels within apartments as the dominant noise break-in contribution to ambient noise levels is the glazing element of the façade.

6.2.2 Road Traffic Noise Assessment

Glazing

The predicted noise levels shown in Figures 6.1 to 6.3 are such that standard acoustically-rated thermal double glazing should ensure appropriate internal noise levels are met across the development. It is therefore recommended that a blanket glazing system is used for the apartments that are not affected by entertainment noise. Table 6.3 provides an indicative minimum sound reduction performance of a glazing example required for all habitable rooms of the development (e.g. bedrooms and living rooms).

Table 6.3: Minimum sound reduction performance (dB) for the glazed elements of habitable rooms in the development

Glazing example	125	250	500	1k	2k	4k	R_w / $R_w + C_{tr}$
Standard thermal double glazing configuration with differing pane thicknesses e.g. 4mm glass / 12mmm cavity / 6mm glass	23	22	27	38	40	41	33/29

The sound insulation requirements of the glazing and any other glazed elements, including balcony doors, are applicable to the glazed system as a whole, including frames, mullions and panels. They are based on BS EN ISO 10140: 2010 "*Acoustics - Laboratory measurement of sound insulation of building elements*" and rated in accordance with BS EN ISO 717-1:2013 "*Acoustics – Rating of sound insulation in buildings and of building elements Part 1. Airborne sound insulation*".

All glazing systems should be capable of meeting the performance specifications detailed above, with test certificates being made available in support. Glazing proposals which only reflect the guidance constructions indicated in this report will not be sufficient evidence that a glazing system will achieve the required performance specification.

Please note that the octave band sound reduction (R) performances shown above for the glazing are indicative examples, minor shortfalls in certain frequency bands could still achieve acceptable internal ambient noise levels in rooms, using alternative systems, where applicable.

The proposed glazing and ventilation façade elements will ensure that appropriate BS 8233 internal noise levels are achieved.

Ventilation

Calculations have been carried out assuming the use of two trickle ventilators (Approved Document F [5] System 1 or 3) per living room and one per bedroom, the minimum performance specification of which is given in Table 6.4. Windows should be openable for purge or rapid ventilation, as requested by ADF. Internal noise level guidelines are generally not applicable under these exceptional events, which should only occur occasionally (i.e. to remove odour from painting, cooking etc.).

It should be noted however that in order to meet the guideline internal noise levels during the overheating condition, mechanical ventilation may be required.

Table 6.4: Minimum element normalized level difference $D_{n,e,w}$ (dB) for the trickle ventilators

Façades	Ventilator	125	250	500	1k	2k	4k	$D_{n,e,w}$ / $D_{n,e,w} + C_{tr}$
Eastern facades facing – Marketplace and Cheap Street	Acoustic trickle ventilator	30	33	38	37	36	36	38/36
All other facades[1]	Standard trickle ventilator	30	31	31	32	28	28	31/30

1) Facades of the development that are not affected by entertainment noise (detailed in following section)

6.2.3 Entertainment Noise Assessment

External Wall Construction

An allowance for additional sound insulation has been made for the apartments that are adjacent to The Newbury's roof terrace. This would include a wall lining installed to the apartment side of the external wall described in in Table 6.2.

Glazing

Due to the high low frequency of the entertainment noise, predicted internal noise levels must be compared to the NANR45 reference curve. In this instance, no relaxation to the criteria is applicable since the noise may occur during night-time hours (23:00-07:00) and is not deemed to be steady (L_{10}-L_{90}>5dB). Figure 6.5 demonstrates that with standard double glazing, internal noise levels will exceed the criteria between 63 and 160Hz. Note this represents the internal noise level for the worst affected apartments.

Figure 6.5: Predicted internal noise levels

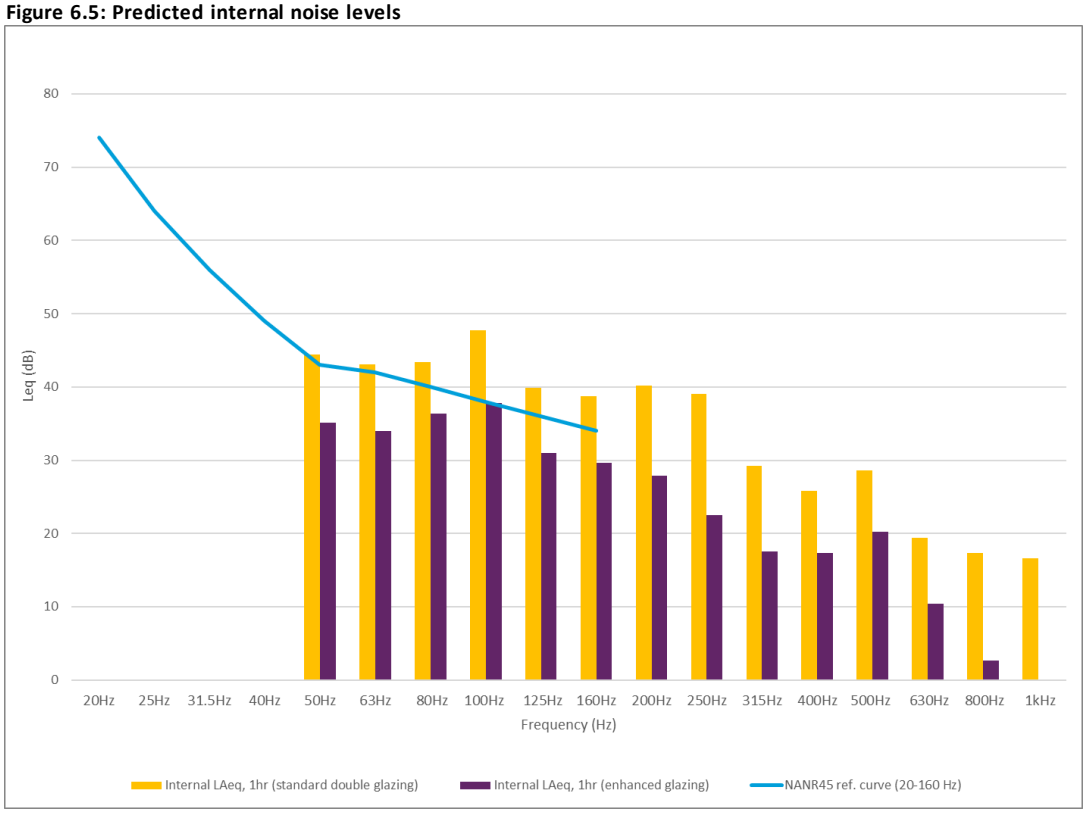


Table 6.5 provides an indicative minimum sound reduction performance of a glazing example required for all the following rooms:

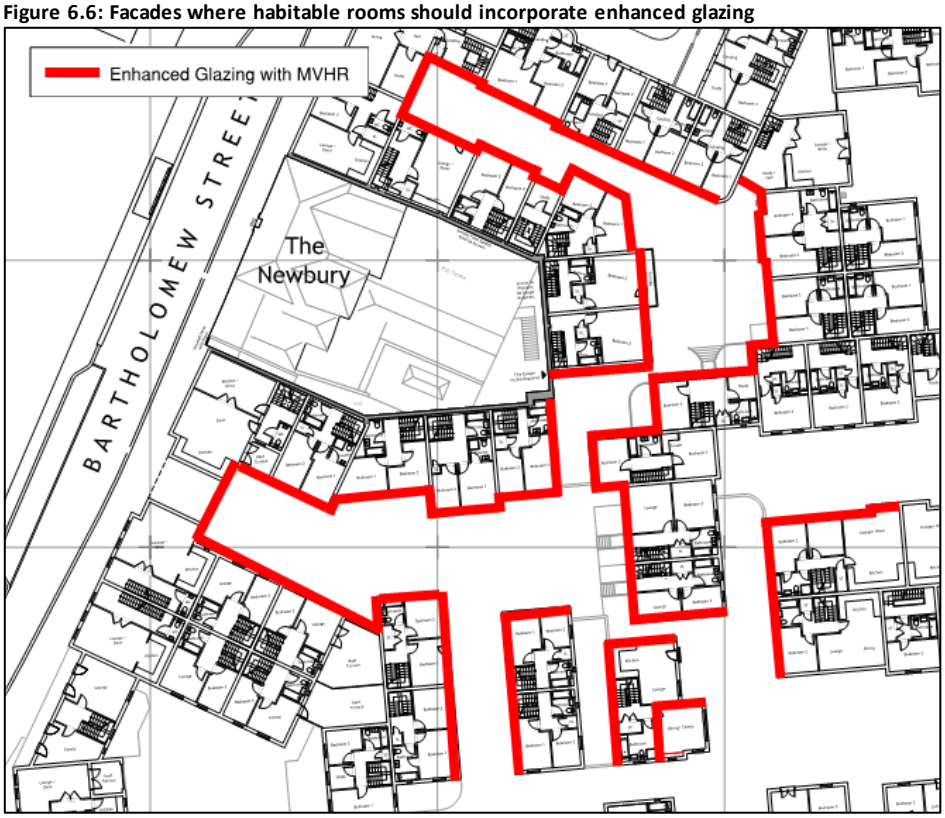
Table 6.5: Minimum sound reduction performance (dB) for the glazed elements of habitable rooms on the eastern facade in the development

Glazing example	63	80	100	125	160	200	250	315	400	500
Pilkington Insulight, Pilkington Acoustic Laminate 16/12/16	31	31	31	31	34	33	34	38	39	43

The example glazing in Table 6.5 has an overall performance of 46 dB R_w, a glazing with a lower overall performance may be used however it is important the performance below 125Hz in Table 6.5 is met.

The described enhanced glazing should be installed to the facades that are impacted by entertainment noise; these are indicated in Figure 6.6 below.

Figure 6.6: Facades where habitable rooms should incorporate enhanced glazing



Ventilation

To meet the NANR45 reference curve, it is not possible to rely on trickle ventilators for ventilation. Therefore, MVHR is to be installed in flats with habitable rooms with windows on the façades highlighted in Figure 6.6 above.

6.2.4 Patron Noise Assessment

Considering the external noise generated by customers of The Newbury's terrace, the apartments exposed to entertainment noise will be effectively mitigated by the measures detailed in Section 3.6.2 and 3.6.3 above. These measures not only address the primary source of noise (entertainment noise) but will also address any potential disturbance from customers using the terrace (given patron activity noise is much lower in level).

Regarding The Corn Exchange, as detailed in Section 4.4, measurements indicate moderate levels of noise, comprising road traffic noise and conversations among pedestrians nearby – it is considered that customer activity would not change throughout the year therefore designing the affected facades to the capture d noise levels will suffice in suitably controlling noise ingress.

Regarding the Catherine Wheels external beer garden, the noise survey did not capture the level of patron noise that could present itself during busier warmer periods. To address this concern an outline worst-case assessment has been carried out to predict the potential noise impact from gathering of customers within this beer garden.

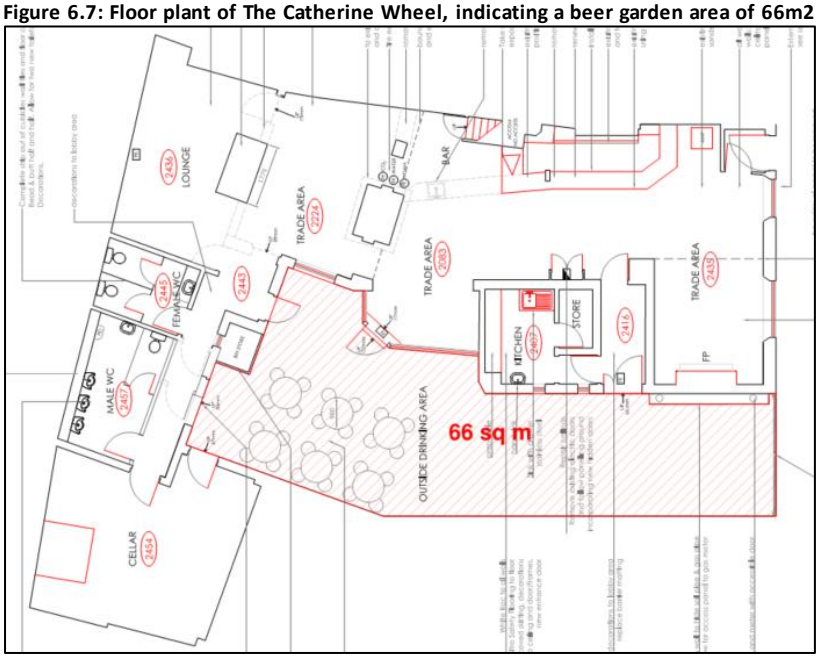
It should be noted that the premises license (premises license number 013352) allows The Catherine Wheel to open during the following times:

- Monday to Wednesday from 10:00 to 23:00
- Thursday to Saturday from 10:00 to 03:00
- Sunday from 10:00 to 22:30

It's worth noting the premises license doesn't explicitly authorize outdoor activities. In any case, we have considered the potential impact during worst-case hours, which are typically night-time periods (from 23.00 hrs onward) but especially on weekends where larger gatherings of people are more likely (Fridays, Saturdays and Sundays).

As we were unable to capture representative activity noise levels (as the beer garden was not in use due to the time of year), historic source data from sites of similar nature has been used to estimate the potential impact of patron activity emanating from the beer garden. The beer garden area has been based on drawings taken from the planning portal as shown in Figure 6.7 below, indicating an approximate area of 66m^2 for potential patron activity.

Figure 6.7: Floor plant of The Catherine Wheel, indicating a beer garden area of 66m2



The following sound power levels have been used to predict external noise levels incident on the northern and eastern façades of Block A:

Table 6.8: Sound Power levels of typical customer activity source data for nominally 6m2 of busy external seating/terrace

Frequency (Hz)	63	125	250	500	1k	2k	4k	8k	A
Customer Activity Noise (dB L_w)	71	73	78	77	71	66	56	71	80

The above sound power levels were extrapolated from attended sound source measurements undertaken in a central London public house; in a small, busy dedicated external terrace/seating area dominated by patron noise (reference occupancy 2 patrons per m2 i.e. ppm2). It is not considered that the same level of occupation nor levels may be representative of patrons occupying the Cathrine Wheels beer garden. As such, corrections have been applied to reduce the occupation pattern and provide a more reasonable assessment.

It should also be noted that other metrics for very short, instantaneous events such as the L_{max} or SEL levels have not been assessed, as it is considered that these would be generally 5-10 dB higher than the assumed sound power level in L_{eq} terms; which will not change the outcome of our assessment as the internal ambient noise criteria increases by 15 dB (from a 30 dB $L_{Aeq,T}$ in bedrooms at night to a 45 dB L_{max}). The increase in source terms would be smaller than the increase in the internal ambient noise level target, therefore the L_{eq} assessment constitutes the worst-case possible scenario. The source levels proposed in Table 5.1 above already contain high levels of patron activity for short term events (including loud shouting and laughing) in L_{eq} terms,

therefore it is considered robust for the purpose of our assessment; so we reference to L_{max} levels is not necessary in this instance as the L_{eq} assessment will represent the worst-case scenario.

As mentioned above The Catherine Wheels beer garden has an area of approximately 66m^2 and comprises of low-density tables and bench style seating. Assuming a worst-case scenario of a similar number of standing customers (i.e. a density of 1 patron per m^2), the following corrections shall be applied to the levels detailed in Table 6.8:

- -3 dB correction for the occupation density [10 LOG (1ppm^2/2ppm^2)] (Where ppm^2 = patron per m^2)
- +11 dB correction for source area [10 LOG (70/6)]

Using the aforementioned data and the noise modelling techniques described in Section 3.6.1, a model has been created to predict the patron noise levels incidence on the Block's worst effected façades – worst-case noise levels are presented Table 6.9 below, with a 3D illustration shown in Figure 6.8.

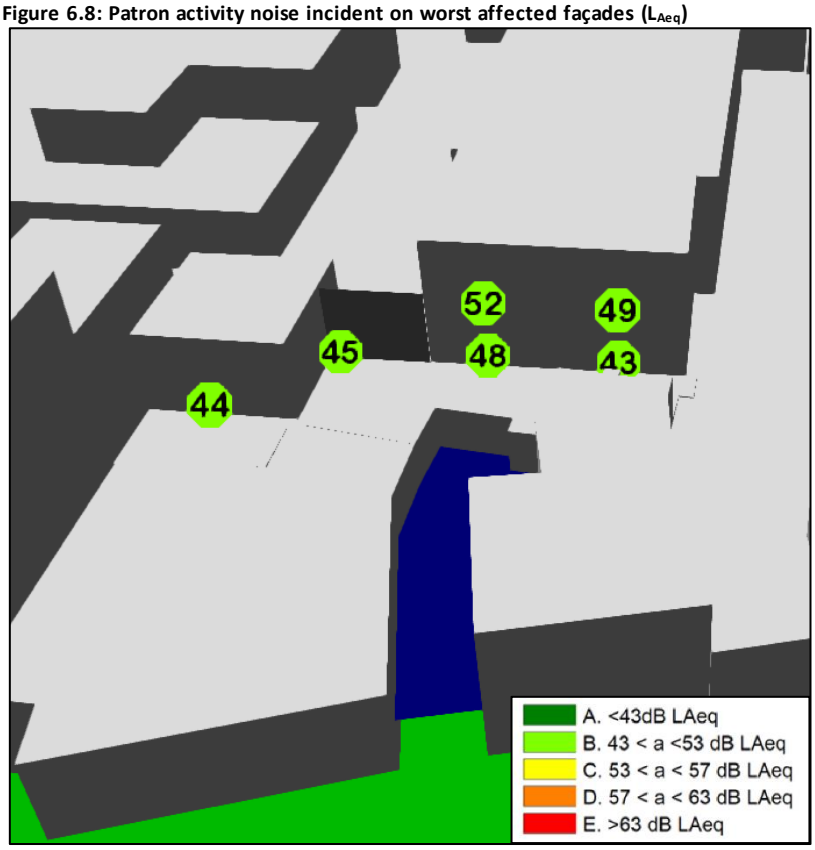
Table 6.9: Predicted worst-case sound pressure levels from beer garden activity, Leq

Frequency (Hz)	63	125	250	500	1k	2k	4k	8k	A
2nd floor apartments	47	45	47	52	47	42	32	24	52

The above noise spectrum has been used to determine the internal noise levels within worst-affect bedrooms of the development. The sound insulation provided by external façade build-up described in Section 6.2.1 with the use of standard glazing (4/12/6mm, 33 dB R_w) would be such that that internal noise levels comfortably meet the 30dB requirement for bedrooms at night, suggesting that noise from patrons in the Catherine Wheel's beer garden should not negatively affect the amenity of the proposed dwellings.

It is recommended that apartments overlooking The Catherine Wheel's beer garden are mechanically ventilated and provided with an alternative means of cooling such that future occupants do not have to open windows during the summer months to avoid overheating.

Figure 6.8: Patron activity noise incident on worst affected façades (L_{Aeq})



6.3 Element 3: External Amenity Area Noise Assessment

As detailed in Section 3.4, BS8233 states that *"it is desirable that the external noise level does not exceed 50dB $L_{Aeq,T}$, with an upper guideline value of 55dB $L_{Aeq,T}$ which would be acceptable in noisier environments"*.

The are several roof terraces and private balconies distributed across the development that typically overlook the quieter internal courtyards. There are also 3rd floor and 5th floor balconies to the southern facades of apartments that overlook Market Street.

Figure 6.9 below shows noise contours mapped across the development during the daytime hours, accounting for road traffic, entertainment noise from the Newbury's roof terrace and patron activity noise from the Catherine Wheel.

Figure 6.9: Predicted external daytime $L_{Aeq,16hr}$ noise levels across development (plots shows noise levels at 3rd floor level)

As indicated in the noise contours above, the noise criteria will be satisfied throughout majority of the external amenity areas. Our acoustic model indicates that the predicted noise levels in balconies of apartments to the southern boundary onlooking Market Street will marginally exceed the target set out by WHO (55 dB $L_{Aeq,T}$). To reduce noise levels in these areas, it is recommended that the balcony balustrades are solid and imperforate (rather than railings, with a surface mass recommended to be ≥ 10 kg/m^2). This should reduce noise levels in balconies by 2-5 dB (depending on the height of the apartment in relation to the nearest road).

Based on the possibility of an exceedance within the balconies, other guidance in ProPG referring to this subject has been looked into; which suggests 4 alternatives to alleviate the potential impact of noisy external amenity areas in developments located in busy, urban areas.

The Stage 2 - Element 3 of the ProPG guidance document states that:

3(v) Where, despite following a good acoustic design process, significant adverse noise impacts remain on any private external amenity space (e.g. garden or balcony) then that impact may be partially off-set if the residents are provided, through the design of the development or the planning process, with access to:

- *a relatively quiet facade (containing openable windows to habitable rooms) or a relatively quiet externally ventilated space (i.e. an enclosed balcony) as part of their dwelling; and/or*
- *a relatively quiet alternative or additional external amenity space for sole use by a household, e.g. a garden, roof garden or large open balcony in a different, protected, location); and/or*
- *a relatively quiet, protected, nearby, external amenity space for sole use by a limited group of residents as part of the amenity of their dwellings; and/or*
- *a relatively quiet, protected, publicly accessible, external 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 minutes walking distance). The local planning authority could link such provision to the definition and management of Quiet Areas under the Environmental Noise Regulations.*

The presence of several shared communal areas and the nearby green space located at Victoria Park (about 5 minute walk); both fulfil the last 2 bullet points in the ProPG guidance above and will provide most residents a quieter, protected, alternative outdoor space compliant with the 55 dB $L_{Aeq,16hour}$ criterion.

As mentioned in BS8233 and summarised in Section 3.4, a balance is needed between the provision of private external amenity areas for enjoyment of residents and the acceptance of periodically noisier balconies; where development is desirable. It is likely that most residents would prefer a balcony, regardless of the external noise levels it is exposed to, rather than no balcony at all. It is therefore considered that external noise levels in suitable areas of the development are acceptable for residential use.

6.4 Element 4: Other Relevant Issues - Overheating

The AVO Guide has been used to assess the suitability of the development to use openable windows as a means of controlling overheating. As detailed in Section 3.3, guidance includes target internal ambient noise levels, operational noise levels for mechanical services and details on ventilation methods including their suitability for mitigating overheating within dwellings. A Level 1 site risk assessment of noise from transport noise sources relating to the overheating condition indicates a potential medium risk on the most exposed bedrooms, based on external noise levels measured during the unattended survey.

6.4.1 Level 2 Assessment of Noise

Glazing and natural ventilation systems are considered to be the 'acoustically weak' elements of a façade (i.e. most prone to external noise intrusion), however, both elements are central to the provision of thermal comfort. This section details the potential to use partially open windows as a form of controlling overheating, and the impact this may have on internal noise levels within bedrooms of the development.

It is best practice, from an energy efficiency standpoint, to allow the simple opening of windows for occupant control of overheating. This however may lead to increased risk of excessive noise intrusion where the proposed buildings are exposed to external noise sources, forcing the occupant to choose between excessive heat or excessive noise break-in. Table 6.10 has been included from the AVO guide to indicate the impact of internal noise levels on occupants relating to the overheating condition.

In relation to the apartments impacted by high levels of entertainment noise (those highlighted in Figure 6.6), it is recommended that these properties are provided with comfort cooling. Using an open window to ventilate these properties would result in excessive break-in noise. These apartments have therefore not been included in the following section which investigates the suitability of an open window to alleviate overheating.

Table 6.10: Guidance for a Level 2 assessment of noise from transport sources relating to overheating condition

Internal Ambient Noise Level			Examples of Outcomes	
$L_{Aeq,16hour}$ during 07:00 – 23:00	$L_{Aeq,\ 8hour}$ during 23:00 – 07:00	Individual noise events during 23:00 – 07:00		
> 50 dB	> 42 dB	Normally exceeds 65 dB $L_{AF,max}$	Noise causes a material change in behaviour e.g. having to keep windows closed most of the time.	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.
			Increasing likelihood of impact on reliable speech communication during the day or sleep disturbance at night.	At higher noise levels, more significant behavioural change is expected and may only be considered suitable if occurring for limited periods. 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. At lower noise levels, limited behavioural change is expected unless conditions are prevalent for most of the time.
≤ 35 dB	≤ 30 dB	Do not normally exceed $L_{Amax,F}$ 45 dB more than 10 times a night	Noise can be heard but does not cause any change in behaviour.	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 perceived change in the quality of life.

The AVO Guide suggests that during the overheating condition, the criteria for internal levels may be relaxed by between 5 and 10 dB compared to the levels recommended by BS8233, depending on the expected duration and frequency of which the overheating condition occurs.

It is possible to estimate the internal noise levels of each room based on the assumption that partially open windows typically provide a sound level difference from external free field to internal noise level of 13 dB. Figures 6.10 and 6.11 below show apartments where an open window is a suitable means of addressing overheating (factoring in the aforementioned relaxation). Note properties exposed to high levels of noise from entertainment activity emanating from the Newbury's roof terrace will have overheating mitigated by comfort cooling and have therefore not been included in Figure 6.10 and 6.11. Facades that are shielded from both road traffic and entertainment noise have also not been included as an open window would be suitable in these instances.

Figure 6.10 – Suitability of an open window to provide cooling – Facades exposed to road traffic noise – Daytime $L_{Aeq,16hr}$

Figure 6.11 – Suitability of an open window to provide cooling – Facades exposed to road traffic noise – Night-time $L_{Aeq,8hr}$

With open windows, noise levels in some rooms may be high enough to cause a disturbance to the occupants.

Therefore, to mitigate against this, it is recommended that a detailed acoustics, ventilation and overheating assessment is carried out during the design stages to understand the expected frequency of the 'overheating condition' and explore potential mitigation measures, such as mechanical ventilative cooling.

7 CONCLUSIONS

Anderson Acoustics Ltd was commissioned by Lochailort Newbury Ltd in March 2024 to provide acoustic consultancy services in relation to the proposed Old Town, Newbury development.

We have conducted a review of design proposals to ensure compliance with ProPG, the outcome of which is summarised below:

- In order to meet the internal ambient noise levels in habitable rooms recommended by BS8223 and NANR45, a scheme of double glazing has been proposed. In general, the glazing to habitable rooms facing St Johns Road should be capable of achieving a minimum sound reduction performance of 29 dB $R_w + C_{tr}$ while those exposed to entertainment noise will require enhanced glazing (sound reduction index R a minimum of 31dB at 63, 80 and 100Hz) to protect against low frequency noise from the neighbouring roof terrace of The Newbury Pub.
- Passive ventilation in the form of standard and acoustic trickle vents have been proposed for properties exposed to road traffic noise. Whole-dwelling mechanical ventilation system with heat recovery (MVHR) and comfort cooling is proposed for apartments that are exposed to entertainment noise.
- Depending on the expected duration and frequency of overheating, according to a thermal assessment, a mixture of openable windows, mechanical ventilative cooling and comfort cooling is likely to be required dependent on façade noise levels.
- Most private balconies and terraces will be compliant with the upper limit of 55 dB $L_{Aeq,T}$ recommended by BS8233. However, exceedances may occur in the balconies onlooking Marketplace to the southern boundary of the development. The design of these balconies may be considered to reduce noise levels while a public green space are approximately a 5-minute walk from the proposed development.

The outcome of our assessment demonstrates that provided the acoustic design measures set out in this report are followed, the site should be suitable for residential use with noise levels in both internal habitable spaces and external amenity in compliance with criteria set out in BS8223, ProPG, NANR45 and the AVO Guide. It should be noted that a detailed assessment should be carried out during the detailed design stages, once the design has progressed further.

Our recommendation to the decision maker would be to grant consent subject to the inclusion of suitable noise conditions.

8 REFERENCES

1 Institute of Acoustics (IOA), Association of Noise Consultants (ANC) and Chartered Institute of Environmental Health (CIEH). Professional Planning Guidance on Planning & Noise (ProPG): New Residential Development. May 2017.

2 Association of Noise Consultants (ANC) and Institute of Acoustics (IOA). Acoustics, Ventilation and Overheating. 2020. British Standards Institution. Sound Insulation and Noise Reduction for Buildings – Code of Practice.

3 British Standards Institution. Sound Insulation and Noise Reduction for Buildings – Code of Practice. BS 8233: 2014.

4 World Health Organisation - Guidelines for Community Noise. 2000.

5 Building Regulations 2010: Approved Document F – Volume 1: Dwellings.

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