Exeter Road Care Home, Topsham - Updated facade design

for

Topsham Care Home Ltd.

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ACT Acoustics Ltd.

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Report information

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Management summary

Topsham Care Home Ltd. has commissioned ACT Acoustics to provide an updated facade specification for at a new care home facility at Land North of Exeter Road, Topsham. The aim of the specification is to protection residential amenity from road traffic noise on Exeter Road.

We have made predictions of road traffic noise across the facade and used the latest drawings of the site to determine the minimum performance requirements of windows and trickle vents. The minimum performance requirements are designed to satisfy the requirements of the IOA's ProPG guidance[1] as well as the guidance provided in BS 8233:2014.

To achieve this, we;

- used the results of our previous noise survey at the site to establish the existing road noise;
- modelled the noise levels around the facade;
- used the dimensions of each room to determine the minimum performance requirements of walls, windows and trickle vents; and
- suggested suitable products for meeting these requirements.

To meet the requirements, we recommend that windows are either;

- Guardian Glass 4 mm float; 18 mm cavity; 6 mm float (or similar); or
- a generic 6 mm float; 12 mm cavity; 10 mm float.

For trickle vents, there should be no more than 2 vents of either type in each room:

- Greenwood L-vent; or
- Greenwood 5000EA.AC1.

The above specification applied to all facades within the scope of this report.

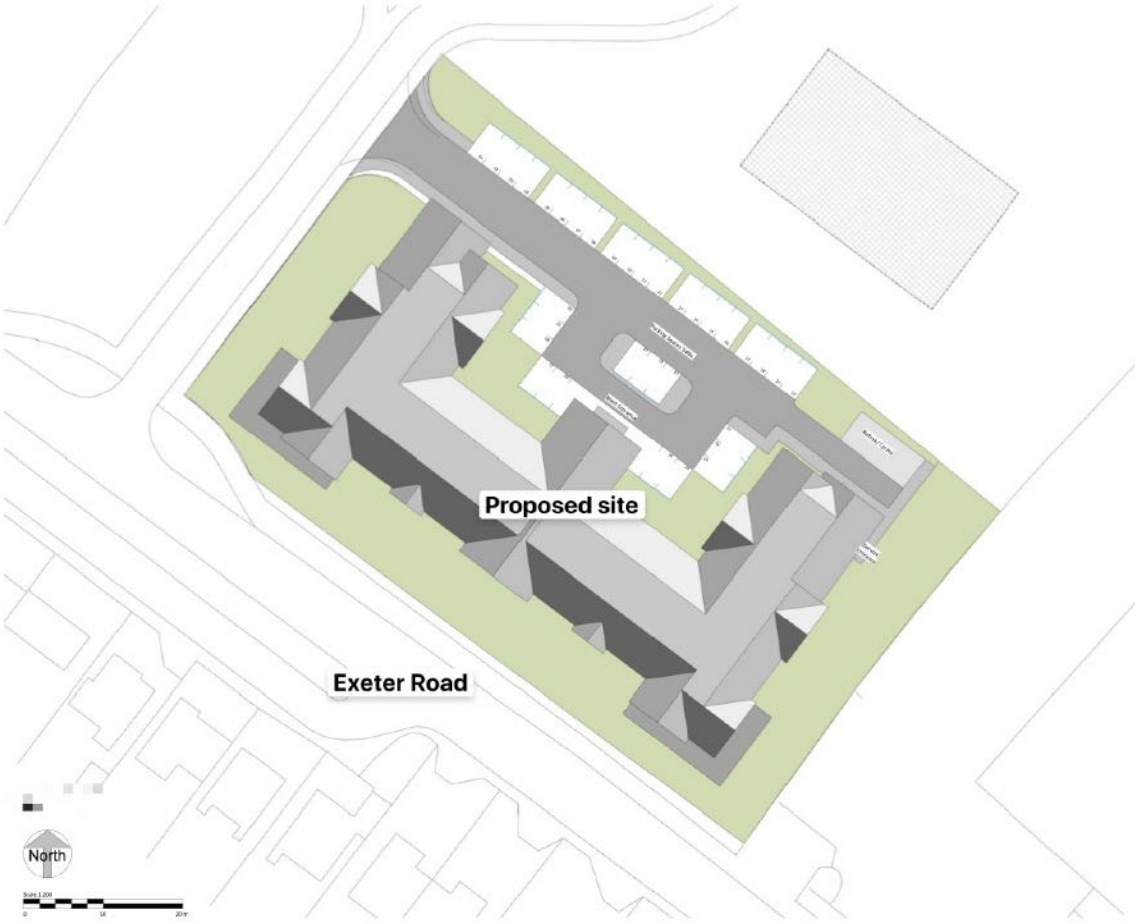
The minimum specificiation for walls is 40 dB Rw + Ctr. We expect this requirement to be satisfied with all external wall types.

Based on our calculations, the specifications provided in this report should satisfy the requirements of both the IOA Guidance and the recommended internal noise levels given in BS 8233:2014. The manufacturer's guidance should be followed in full for all recommended products.

1. Planning & Noise Professional Practice Guidance on Planning & Noise: New Residential Development (Institute of Acoustics, May 2017).

1. Introduction

The proposed site is located near to Exeter Road, Topsham:

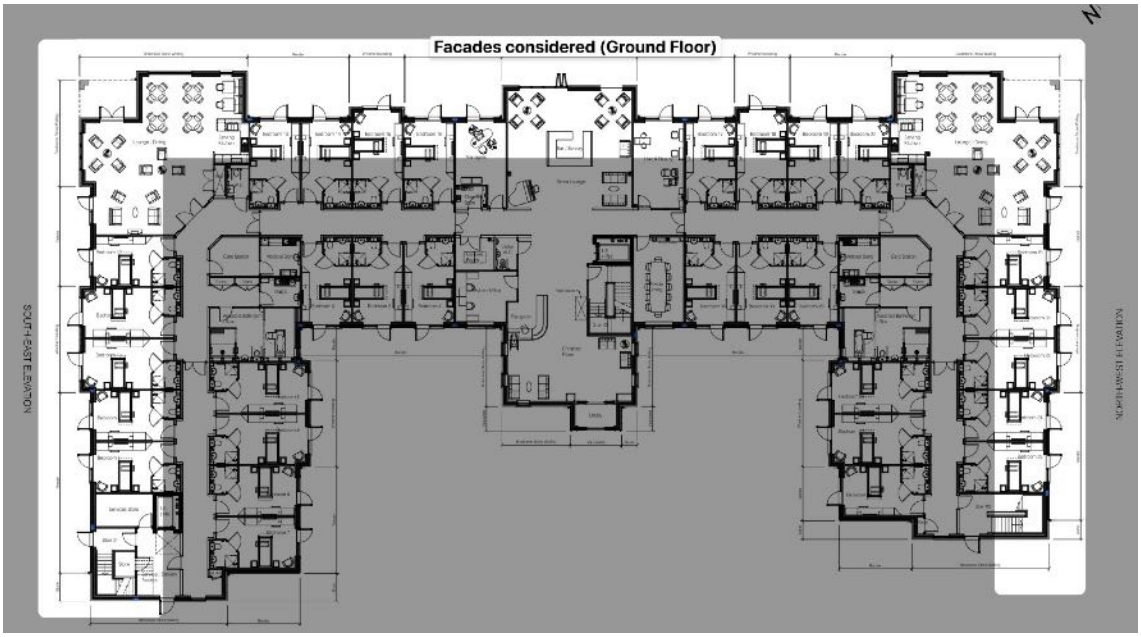


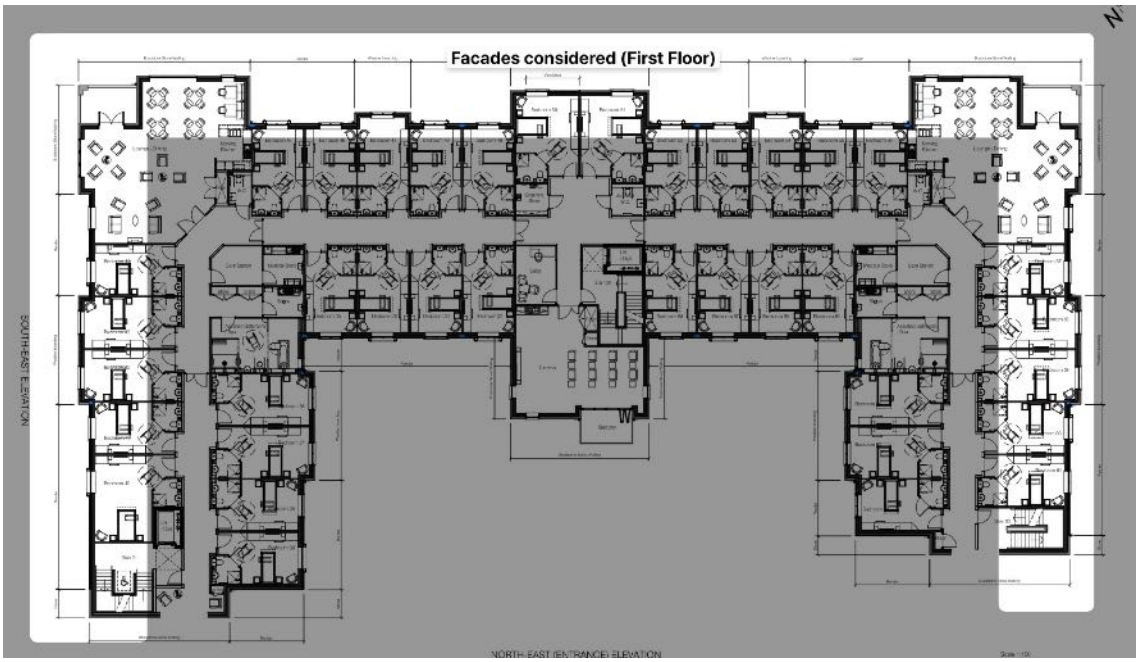
The principal source of noise affecting the site is road traffic on Exeter Road. The facades most affected are units on the south west, north west and south east facades.

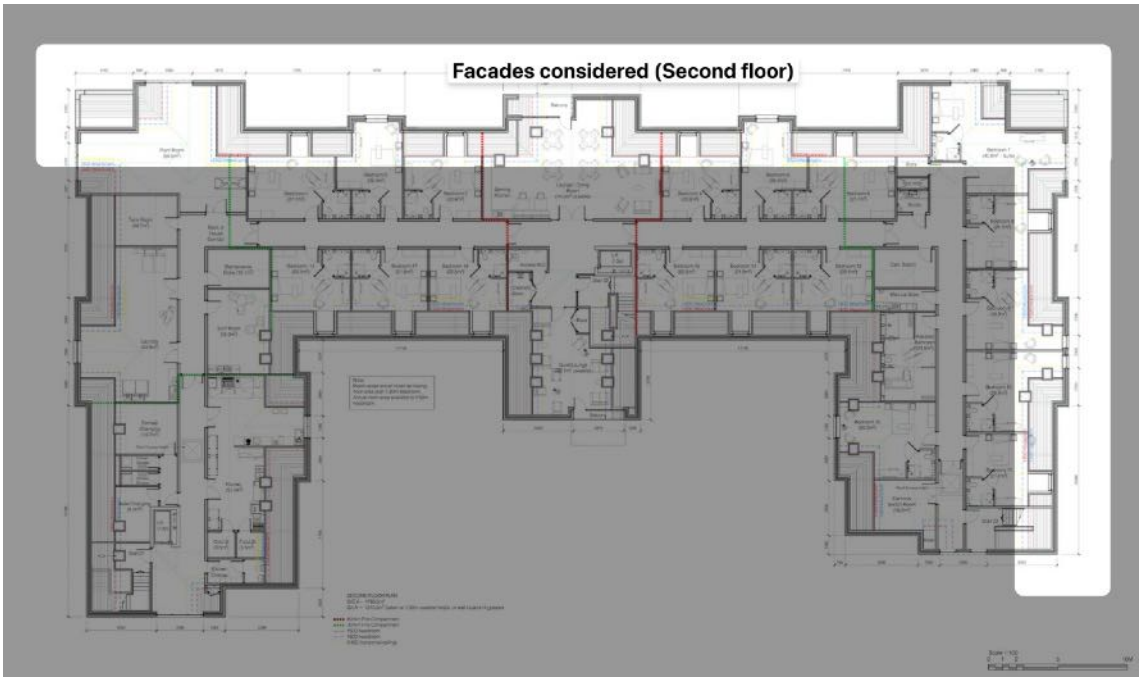
In this report we make reference to our previous Report Reference 200115-020 (available here: https://actacoustics.link/410).

1.1. Scope and limitations to this report

This scope of this report is limited to the assessment of road noise and it's effect on the residential rooms on the facades shown below:






Facades considered (Second floor)

2. Policy and standards

2.1. National Planning Policy Framework

The National Planning Policy Framework (NPPF) was published in March 2012. The framework replaces Planning Policy Guidance 24 (Planning and Noise). Paragraph 109 of NPPF states:

> The planning system should contribute to and enhance the natural and local environment by preventing both new and existing development from contributing to, or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water, or noise pollution or land instability.

Further, Paragraph 123 states;

> Planning policies and decisions should aim to avoid noise giving rise to significant adverse impacts on health and quality of live as a result of a new development; mitigate and reduce to a minimum other noise 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 that existing businesses 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; and identify and protect areas of tranquility which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.

The NPPF does not provide any guidance on how noise should be assessed, nor does it provide any criteria with which the adverse effects of noise can be quantified.

2.2. Noise Policy Statement for England

The Noise Policy Statement for England (NPSE) is referred to in the NPPF. Published in March 2010, the NPSE aims to provide clarity regarding current policies and practices as well as enabling noise decisions to be made within the wider context, at the most appropriate level, in a cost effective manner and in a timely fashion. It applies to all forms of noise including environmental noise, neighbour and neighbourhood noise.

The NPSE sets out the long term vision of the Government's noise policy. This supported 'through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- avoid significant adverse effects on health and quality of life;
- mitigate and minimise adverse impacts on health and quality of life; and
- where possible, contribute to the improvement of health and quality of life.'

The NPSE introduces the concept of 'effect levels' to relate the impact of noise the to stated policy aims.

No observable effect level (NOEL)

This is the level below which no effect can be detected. Below this level, there is no detectable effect on health and quality of life due to noise.

Lowest observable effect level (LOAEL)

This is the level at which adverse effects on health and quality of life can be detected.

Significant observable adverse effect level (SOAEL)

This is the level at which significant adverse health effects start to occur.

2.2.1. Potential for noise impact

Where there is potential for noise impact, the NPSE states:

> The second aim of the NPSE refers to the situation where the impact lies somewhere between LOAEL and SOAEL. It requires that all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also taking into account the guiding principles of sustainable development [detailed in paragraph 1.8]. This does not mean that such adverse impacts cannot occur.

The NPSE does not provide any assessment criteria for the various effect levels, and each case needs to considered on its own merits. The NPSE emphasises that Local Planning Authorities are required to take a balanced approach in considering the benefits of a development. Paragraph 2.18 of the NPSE states:

> There is a need to integrate consideration of the economic and social benefits of the activity or policy under examination with proper consideration of the adverse environmental effects, including the impact of noise on health and quality of life. This should avoid noise being treated in isolation in any particular situation, i.e. not focusing solely on the noise impact without taking into account other related factors.

The planning need is outside the scope of this report. Planning issues other than noise should be addressed by others.

2.3. National Planning Policy Guidance: Noise

The National Planning Practice Guidance (NPPG) on noise referred to here is based on the current version (18 Jun 2020) as provided on the Planning Guidance Website. It states:

> Noise needs to be considered when new developments may create additional noise and when new developments would be sensitive to the prevailing acoustic environment.

The NPPG also provides guidance on determine noise impact, and what factors might be relevant. Four mitigation options are provided;

- engineering
- layout;
- using planning conditions; and
- noise insulation.

Paragraph 5 of the NPPG provides a table of effect levels and gives examples of noise impact levels:

Perception	Examples of outcomes	Increasing effect level	Action
Not noticeable	No Effect	No observed effect	No specific measures required
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

Perception	Examples of outcomes	Increasing effect level	Action
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
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant observed adverse effect	Avoid
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.Â auditory and non-auditory.	Unacceptable adverse effect	Prevent

The table does not provide quantitative levels for the above effects. However, where noise is audible it is not necessarily intrusive. The impact is based primarily on the level of noise.

The NPSE states that noise levels above the Lowest Observed Adverse Effect Level are acceptable in planning. However, these must be reduced to a minimum where practicable and should take account of other planning considerations.

2.4. ProPG Assessment Method

The ProPG guidance details four elements for an acoustic assessment of sites proposed for residential development. It comprises two stages.

The first stage is an initial risk assessment of the site. This is followed by stage 2 which is formed of a four-element detailed assessment.

2.4.1. Stage 1

The first stage of the assessment is to assess the risk from the existing noise levels. The risk assessment classifies different areas of the site according their respective noise levels:

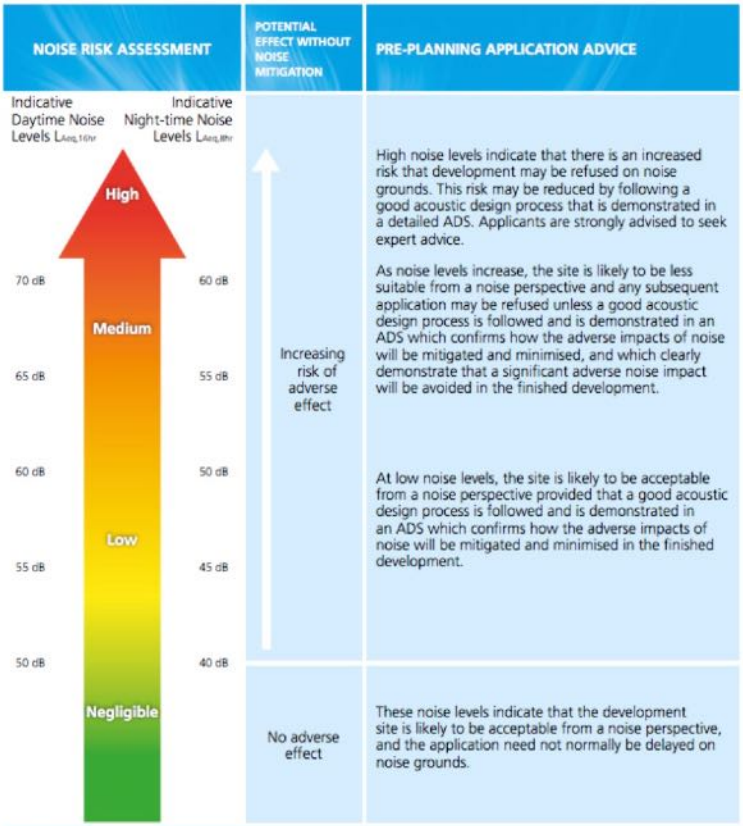


Figure 1 Notes:

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

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

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

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

The noise risk assessment can be produced on the basis of either noise measurement or prediction and should:

> "aim to describe noise levels over a typical worst case 24 hour day either now or in the foreseeable future".

Our interpretation of the noise risk levels are shown below:

Risk level	Day range (LAeq)	Night range (LAeq)
Negligible	0 - 52.5	0 - 42.5
Low	52.6 - 62.5	42.6 - 52.5
Medium	62.6 - 72.5	52.6 - 62.5
High	72.6 -	62.6 -

2.4.2. Stage 2

Stage 2 provides a more detailed assessment of the noise.

2.4.2.1. Element 1: Good Acoustic Design Process

Regarding the application of a 'good acoustic design process', ProPG states the following:

> 2.17 Following a good acoustic design process is an implicit part of achieving good design as required by Government planning and noise policy, set out in the NPSE and NPPF, and as outlined in Supplementary Document 1.
>
> 2.18 It is imperative that acoustic design is considered at an early stage of the development control process.
>
> 2.19 A good acoustic design process takes a multi-faceted and integrated approach to achieve optimal acoustic conditions, both internally (inside noise-sensitive parts of the building(s)) and externally (in spaces to be used for amenity purposes).
>
> 2.20 Good acoustic design should avoid "unreasonable" acoustic conditions and prevent "unacceptable" acoustic conditions (these terms are defined in Element 2). Good acoustic design does not mean overdesign or gold plating of all new development but seeking to the optimum acoustic outcome for a particular site.
>
> 2.21 Good acoustic design is not just compliance with recommended internal and external noise exposure standards. Good acoustic design should provide an integrated solution whereby the optimum acoustic outcome is achieved, without design compromises that will adversely affect living conditions and the quality of life of the inhabitants or other sustainable design objectives and requirements.
>
> 2.22 Using fixed unopenable glazing for sound insulation purposes is generally unsatisfactory and should be avoided; occupants generally prefer the ability to have control over the internal environment using openable windows, even if the acoustic conditions would be considered unsatisfactory when open. Solely relying on sound insulation of the building envelope to achieve acceptable acoustic conditions in new residential development, when other methods could reduce the need for this approach, is not regarded as good acoustic design. Any reliance upon building envelope insulation with closed windows should be justified in supporting documents.

2.4.2.2. Element 2: Internal noise level guidelines

The ProPG guidance suggests that the ideal internal noise levels are:

Ideal internal noise levels			
Activity	Location	Daytime	Nighttime
Resting	Living Room	35	-
Dining	Dining room / area	40	-
Sleeping (daytime resting)	Bedroom	35	30

An open window typically provides around 10 - 15 dB of noise attenuation. The limits for allowing ventilation through an open window are therefore:

Ideal external noise levels			
Activity	Location	Daytime	Nighttime
Resting	Living Room	50	-
Dining	Dining room / area	55	-
Sleeping (daytime resting)	Bedroom	50	45

2.4.2.3. Element 3: External amenity noise assessment

It is recommended that outdoor noise levels in external amenity spaces (such as gardens and recreation areas) should be below the range 50 - 55 dB LAeq16hr. This is to ensure that future residents can enjoy outdoor areas.

2.4.2.4. Element 4: Assessment of other relevant issue

ProPG also recommends that any other relevant acoustic issues are considered as part of the detailed assessment.

2.5. BS 8233 - Recommended domestic noise levels

BS 8233 gives recommended internal ambient noise levels for living spaces in domestic dwellings and provides the following ideal noise levels:

Indoor ambient noise levels			
Activity	Location	0700 - 2300	2300 - 0700
Resting	Living Room	35 dB LAeq,16hr	No requirement
Dining	Dining room / area	40 dB LAeq,16hr	No requirement
Sleeping (daytime resting)	Bedroom	35 dB LAeq,16hr	30 dB LAeq,8hr

The above noise levels are typically most affected by external noise sources, such as road and rail.

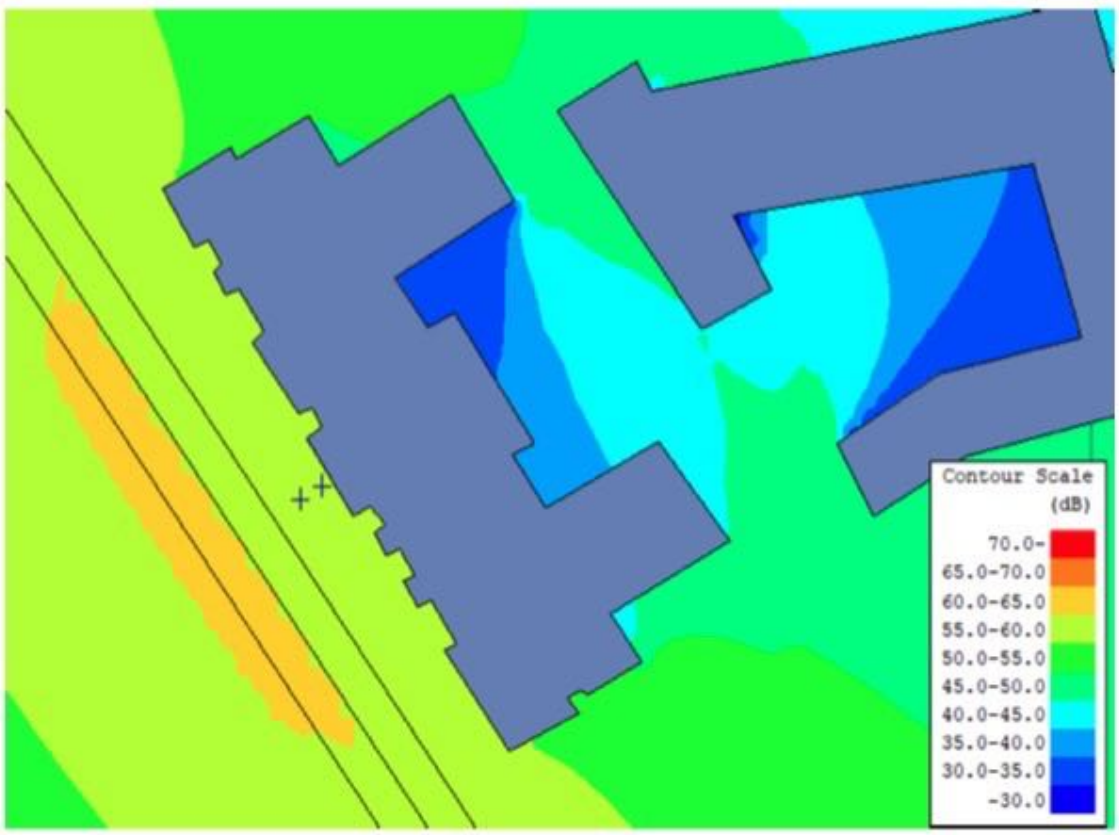
Dwellings should be designed such that the above levels are met whilst providing sufficient ventilation. In some cases, where dwellings are close to busy roads or railways, it may not be possible to provide sufficient acoustic protection when a window is open. In these cases, an alternative means of ventilation may need to be provided. This does not mean that windows cannot be operable, but that additional alternative means of ventilation should be provided. These can include acoustically attenuated trickle vents, and, in more severe use-cases, mechanical ventilation systems.

3. Survey and noise model summary

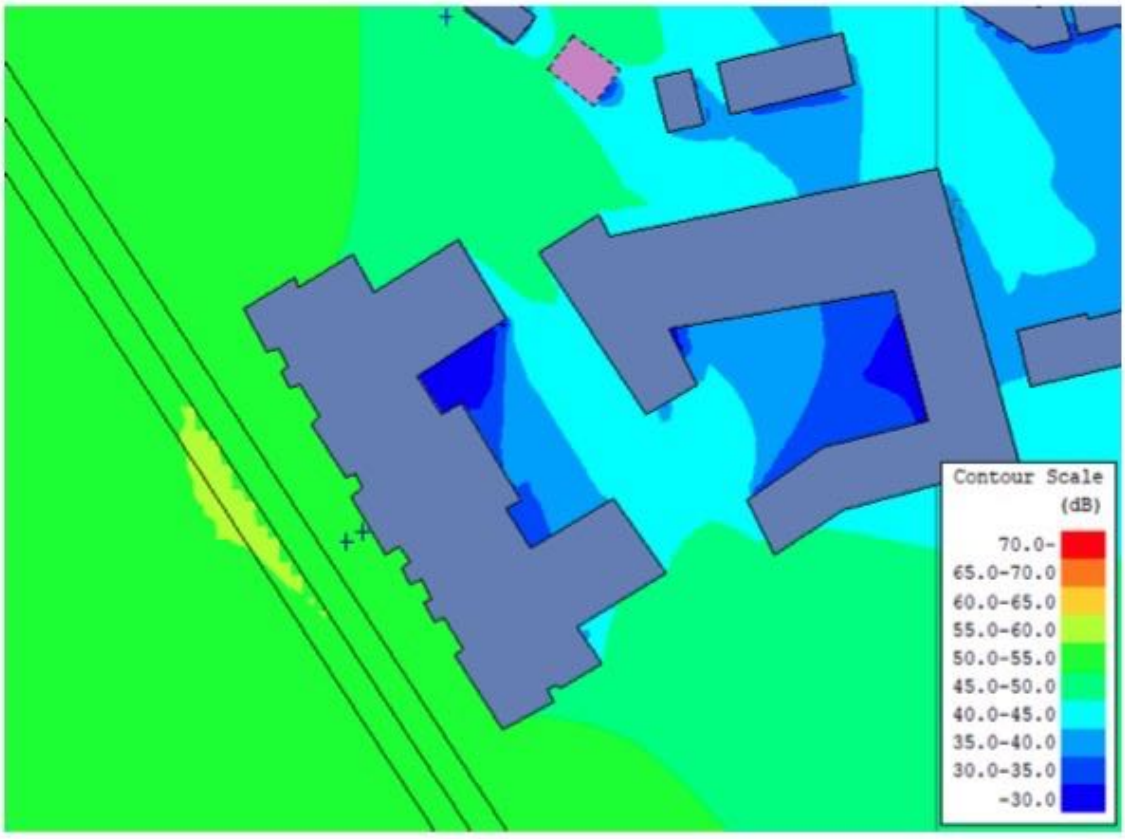
The results of the survey showed that the typical noise levels at the most exposed facade were likely to be:

- Average equivalent daytime noise level: 62 dB LAeq (0700 - 2300)
- Average equivalent nighttime noise level: 56 dB LAeq (2300 - 0700)
- Typical 10th noisiest event: 72 dB LAmax (2300 - 0700)

This data was used to calibrate the noise model to predict noise across the facades:



Ground floor day (figures in LAeq,16hr)



Ground floor night (figures in LAeq,8hr)

We used both the results of this noise model and the dimensions of each room to determine the required performance.

4. Required specifications

We have calculated the required specification for window and trickle-ventilation in using the *more rigourous* calculation in BS 8233:2014 (Section G.2.1).

The performance of the facade is dependent on;

- the external noise levels;
- the dimensions of the facade; and
- the acoustic performance of the windows, vents and walls.

4.1. Simplified specifications

We have calculated the minimum performance requirements of windows and trickle vents for each room. The required performance specifications range between:

- 22 dB Rw + Ctr and 30 dB Rw + Ctr for windows; and
- 28 dB Dne + Ctr and 36 dB Dne + Ctr for trickle vents.

4.2. Meeting the requirements

To meet the requirements, we recommend that windows are either;

- Guardian Glass 4 mm float; 18 mm cavity; 6 mm float (or similar); or
- a generic 6 mm float; 12 mm cavity; 10 mm float.

For trickle vents, there should be no more than 2 vents of either type in each room:

- Greenwood L-vent; or
- Greenwood 5000EA.AC1.

The above specification applied to all facades within the scope of this report.

The minimum specificiation for walls is 40 dB Rw + Ctr. We expect this requirement to be satisfied with all external wall types.

5. Conclusion

We have made predictions of road traffic noise across the facade and used the latest drawings of the site to determine the minimum performance requirements of windows and trickle vents.

We have;

- used the results of our previous noise survey at the site to establish the existing road noise;
- modelled the noise levels around the facade;
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Appendix

Room calculation results

The full results of the facade calculations are shown below:

Unit	Room	Floor	R required	Min Window Rw	Min Wall Rw	Min Vent Dne	Max vents
1	Bedroom	2	27	29.0	39.0	35.0	2
2	Bedroom	2	27	28.0	38.0	34.0	2
3	Bedroom	2	27	30.0	40.0	36.0	2
4	Bedroom	2	27	30.0	40.0	36.0	2
5	Bedroom	2	27	28.0	38.0	34.0	2
6	Bedroom	2	27	29.0	39.0	35.0	2
7	Bedroom	2	27	28.0	38.0	34.0	2
8	Bedroom	2	22	25.0	35.0	31.0	2
9	Bedroom	2	22	22.0	32.0	28.0	2
10	Bedroom	2	22	22.0	32.0	28.0	2
11	Bedroom	2	22	25.0	35.0	31.0	2
40	Bedroom	1	22	22.0	32.0	28.0	2
41	Bedroom	1	22	22.0	32.0	28.0	2
42	Bedroom	1	22	22.0	32.0	28.0	2
43	Bedroom	1	22	22.0	32.0	28.0	2
44	Bedroom	1	22	22.0	32.0	28.0	2
45	Bedroom	1	27	27.0	37.0	33.0	2
46	Bedroom	1	27	27.0	37.0	33.0	2
47	Bedroom	1	27	27.0	37.0	33.0	2
48	Bedroom	1	27	27.0	37.0	33.0	2
49	Bedroom	1	27	27.0	37.0	33.0	2
50	Bedroom	1	27	27.0	37.0	33.0	2
51	Bedroom	1	27	27.0	37.0	33.0	2
52	Bedroom	1	27	27.0	37.0	33.0	2
53	Bedroom	1	27	27.0	37.0	33.0	2
54	Bedroom	1	27	27.0	37.0	33.0	2
55	Bedroom	1	27	27.0	37.0	33.0	2
56	Bedroom	1	27	27.0	37.0	33.0	2
57	Bedroom	1	22	22.0	32.0	28.0	2
58	Bedroom	1	22	22.0	32.0	28.0	2
59	Bedroom	1	22	22.0	32.0	28.0	2
60	Bedroom	1	22	22.0	32.0	28.0	2
60	Bedroom	1	22	22.0	32.0	28.0	2
61	Bedroom	1	22	22.0	32.0	28.0	2
8	Bedroom	0	22	24.0	34.0	30.0	2
9	Bedroom	0	22	24.0	34.0	30.0	2
10	Bedroom	0	22	24.0	34.0	30.0	2
11	Bedroom	0	22	24.0	34.0	30.0	2
12	Bedroom	0	22	24.0	34.0	30.0	2
13	Bedroom	0	27	28.0	38.0	34.0	2

Unit	Room	Floor	R required	Min Window Rw	Min Wall Rw	Min Vent Dne	Max vents
14	Bedroom	0	27	28.0	38.0	34.0	2
15	Bedroom	0	27	30.0	40.0	36.0	2
16	Bedroom	0	27	28.0	38.0	34.0	2
17	Bedroom	0	27	28.0	38.0	34.0	2
18	Bedroom	0	27	30.0	40.0	36.0	2
19	Bedroom	0	27	28.0	38.0	34.0	2
20	Bedroom	0	27	28.0	38.0	34.0	2
21	Bedroom	0	22	24.0	34.0	30.0	2
22	Bedroom	0	22	24.0	34.0	30.0	2
23	Bedroom	0	22	24.0	34.0	30.0	2
24	Bedroom	0	22	24.0	34.0	30.0	2
25	Bedroom	0	22	24.0	34.0	30.0	2

Typical noise levels

The below table shows typical noise levels for reference:

Source	dBA SPL
Jet aircraft at a 50m distance	140
Threshold of pain	130
Threshold of discomfort	120
Chainsaw at a 1m distance	110
Disco, 1m from speaker	100
Diesel truck at a 10m distance	90
Kerbside of busy road at a 5m distance	80
Vacuum cleaner at a 1m distance	70
Conversational speech at a 1m distance	60
Average home	50
Quiet library	40
Quiet bedroom at night	30
Background in TV studio	20
Rustling leaves in the distance	10
Threshold of human hearing	0

6. Common acoustic terminology

We have provided a list of common acoustic terminology below. We hope this helps the reader understand some of the more technical (and non-technical) terms. However, in the case of any confusion, please don't hesitate to get in touch and we will be happy to explain further.

Sound: The audible transmission of vibrations through air or water.

Noise: Unwanted sound. Sound that causes disturbance.

Ground-borne Vibration: Vibration transmitted through the ground. Has the potential cause disturbance, even damage at sufficient levels. Typically measured as Vibration Dose Values (VDVs).

Re-radiated Noise (or 'Ground-borne Noise'): Ground-borne vibration can cause walls, floors and ceilings to radiate noise. This is often referred to as ground-borne noise. Mechanical plant may also generate noise by similar means.

Cross-talk Sound transmission between rooms via ventilation ducting.

Decibel (dB): The standard unit for defining sound pressure levels. The range of normal hearing is between 0 dB and 130 dB Where 130 dB is the upper threshold of pain. A change of 1dB in sound pressure levels is barely perceptible and 3dB is normally the minimum audible difference. A change of 5dB is clearly audible. A change of 10dB roughly corresponds to a halving or doubling of perceived loudness.

dBA (A-weighted decibel): A-weighted decibels use a frequency weighting to correspond to how the human ear hears sound.

LAeq,T (equivalent continuous noise level): The A-weighted equivalent average noise level (LAeq) is commonly used to describe the average noise level in a given environment over the measurement period.

LA10,T: The A-weighted level of noise exceeded for 10% of the specified measurement period (T). It gives an indication of the upper limit of fluctuating noise and is commonly used in traffic noise measurements.

LA90,T: The A-weighted level of noise exceeded for 90% of the specified period (T). It is commonly used to define background noise level; the underlying level in the absence of intermittent noise.

LAmax (maximum noise level): The highest A-weighted noise level recorded during the measurement period. It is measured using the fast sound level meter response.

Hz (Hertz): Hz is the unit of frequency, equal to one pressure fluctuation cycle per second. Frequency is related to the pitch of a sound.

Free-field: A sound measurement taking in the absence of any reflecting objects. Generally measured outside and away from buildings.

Facade-level: A measurement taken in close proximity (e.g. 1 m) to a reflective surface other than ground, such as a building facade. This typically increases the measured level by around 3 dB.

Reverberation: The reverberation time (RT60) is the time required for the sound pressure level in an enclosed space to decay by 60dB.

Sound absorption: Directly related to reverberation. More sound absorption results in a shorter reverberation time.

Sound insulation: A general term describing how much the sound level is reduced by a partition or facade.

Dw (Weighted level difference): A single-number quantity describing airborne sound insulation between rooms. This values is not normalised to reference conditions.

DnT,w (Weighted standardised level difference): A single-number quantity describing airborne sound insulation between rooms. The values is corrected for a standard reverberation time of 0.5 seconds.

Dne,w: A single-number quantity that describes the sound insulation of ventilators.

L'nT,w (Weighted standardised impact sound pressure level): A single-number quantity that describes the impact sound insulation of floors. Impact sound is caused by physical impacts on the floor and is quantified by placing a tapping machine on the floor to measure its response. LnTw is the sound level in the room below that has been corrected to a reference reverberation time (typically 0.5 seconds unless stated otherwise).

Rw (Weighted sound reduction index): The weighted sound reduction index is a single number laboratory-measured rating used to describe the sound insulation performance of building elements.

R'w (Apparent weighted sound reduction index): Similar to Rw but measured onsite. R'w normally tends to be lower than the laboratory rated Rw level due to onsite conditions.

C: A spectral correction applied to Rw values to account for the type of noise made by activities such as talking, music, radio, TV, children playing, railway traffic at medium and high speeds, highway road traffic > 80 km/h, jet aircraft at short distances, and factories emitting medium and high frequency noise.

Ctr: A spectral correction applied to Rw values to account for noise from urban road traffic, railway traffic at low speeds, propeller driven aircraft, jet aircraft at large distances and factories emitting low and medium frequency noise.

NR (Noise Rating): Noise rating is a method for assigning a single number level to a noise spectrum. It is typically used to specify allowable noise emissions from mechanical ventilation systems in buildings. For a typical noise spectrum the NR level is approximately equivalent to the dBA level minus 6.

BS4142:2014: A British Standard that provides guidance on assessing the effect of noise from commercial operations on residential dwellings.

Ambient Noise (La as used in BS4142:2014): The sound that comprises the total sound for a specific situation and time (e.g. distant road traffic plus wildlife plus an conditioning unit or other commercial noise source).

Specific Noise (Ls as used in BS4142:2014): The sound arising from the source being assessed (e.g. an air conditioning unit or other commercial noise source).

Residual Noise (as used in BS4142:2014): The sound remaining when the specific sound is inaudible (e.g. distant road traffic plus wildlife)

Rated Noise LArTr (as used in BS4142:2014): The specific noise level with penalties for characteristic features of the noise (i.e. tonality, intermittency or impulsivity)

Background Noise (as used in BS4142:2014): The sound level that is exceeded for 90% of the time.

BS8233:2014: A British Standard that provides guidance for the control of noise in and around and

within buildings, both domestic and commercial.

Disclaimer

This report is confidential to the client. ACT Acoustics Ltd accepts no responsibility whatsoever to third parties to whom this report, or any part thereof, is made known, unless formally agreed by ACT Acoustics Ltd. Any such party relies upon the advice given in this report at their own risk.

All design advice given in this report should be checked with a suitably qualified structural engineer, fire safety engineer, chartered building surveyor, building services engineer and your local building control officer as required. Suitably qualified consultants can be found at he Institution of Structural Engineers (www.istructe.org/finding-a-structural-engineer), the Royal Institution of Chartered Surveyors (www.rics.org/uk) and the Chartered Institution of Building Services Engineers (www.cibse.org). The manufacturer's guidance should be followed in full for all recommended products in this report.

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