NOISE IMPACT ASSESSMENT

21 Brighton Road, Lancing, BN15 8RJ

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This report has been compiled by Deane Austin Ltd (DAA) with all reasonable skill, care and diligence in accordance with generally accepted acoustic consultancy principles. Information contained in this document contains confidential and commercially sensitive information and shall not be disclosed to third parties.

1.0 INTRODUCTION

DAA Group has been appointed to carry out a Noise Impact Assessment at 21 Brighton Road, Lancing, BN15 8RJ to support Planning Application Ref: AWDM/1612/22 for the First Floor Extension to Former Manager's Bungalow To Form Additional Accommodation For Residents, Visitors & Staff and to ensure it does not prejudice the amenities of any future occupants in accordance with:

- National Planning Policy Framework 2021 (NPPF)
- National Planning Practice Guidance (NPPG)
- Policies 15 and 34 of the Adur Local Plan

The purpose of the survey is to satisfy the below condition:

"05. Construction work shall not commence until a scheme for protecting the proposed noise sensitive development from external traffic noise has been submitted to and approved by the local planning authority. All works which form part of the scheme, shall be completed before any part of the noise sensitive development is occupied. The scheme shall have regard to the principles contained within the ProPG: Planning & Noise - New Residential Development, 2017 and achieve the indoor ambient noise levels for dwellings specified in BS8233:2014. The scheme should be of good acoustic design, include full details of glazing, and a strategy to prevent overheating. Work shall be carried out in accordance with approved details and shall remain as such unless otherwise approved in writing by the Local Planning Authority.."

Using results of the noise survey, the sound insulation performance for the whole building envelope including glazing (windows) is assessed, and a scheme of noise mitigation measures is established and included in the report verified by BS8233:2014 rigorous method building envelope sound insulation calculations.

A scheme of noise mitigation measures in the report provides specification details as appropriate for sound insulation treatment to the separating walls and separating floors.

The technical content of this assessment has been provided by a Tech member of the Institute of Acoustics.

The Institute of Acoustics is the UK's professional body for those working in acoustics, noise and vibration.

2.0 NOISE CRITERIA

2.1 NATIONAL PLANNING POLICY FRAMEWORK (NPPF)

The Department for Communities and Local Government introduced the National Planning Policy Framework (NPPF) in March 2012. The latest revision of the NPPF is dated July 2021.

The NPPF sets out the Government's planning policies for England and how these are expected to be applied. It provides a framework where local Councils can produce their own local and neighbourhood plans which reflect the needs of their communities.

In conserving and enhancing the natural environment, the planning system should prevent both new and existing development from contributing to, or being put at, unacceptable risk from environmental factors including noise.

Planning policies and decisions should aim to avoid noise giving rise to significant adverse impacts on health and quality of life as a result of new development. Conditions may be used to mitigate and reduce noise to a minimum so that adverse impacts on health and quality of life are minimised. It must be recognised that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them. Reference is made within NPPF to the Noise Policy Statement for England (NPSE) as published by DEFRA in March 2015

2.2 NOISE POLICY STATEMENT FOR ENGLAND (NPSE)

The long-term vision of the NPSE is stated within the documents scope, to 'promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development'. The policy aims are stated to:

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

The application of NPSE should mean that noise is properly taken into account at the appropriate time (for example in planning applications or appeals) where it must be considered alongside other relevant issues. The guiding principles of Government policy on sustainable development should be used to assist in the implementation of the NPSE.

The NPSE should apply to all types of noise apart from occupational noise in the workplace. The types of noises defined in the NPSE includes:

- Environmental noise from transportation sources;
- Neighbourhood noise which includes noise arising from within the community; industrial premises, trade and business premises, construction sites and noise in the street

The Noise Policy Statement England (NPSE) outlines observed effect levels relating to the above, as follows:

- **NOEL – No Observed Effect Level**
  - o This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.
- **LOAEL – Lowest Observed Adverse Effect Level**
  - o This is the level above which adverse effects on health and quality of life can be detected.

• SOAEL – Significant Observed Adverse Effect Level
o This is the level above which significant adverse effects on health and quality of life occur.

As stated in The Noise Policy Statement England (NPSE), it is not currently possible to have a single objective based measure that defines SOAEL that is applicable to all sources of noise in all situations. Specific noise levels are not stated within the guidance for this reason, and allow flexibility in the policy until further guidance is available.

2.3 ProPG: PLANNING AND NOISE

As outlined above, the National Planning Policy Framework encourages improved standards of design, although it provides no specific noise levels which should be achieved on site for varying standards of acoustic acceptability, or a prescriptive method for the assessment of noise.
ProPG: Planning and Noise was published in May 2017 in order to encourage better acoustic design for new residential schemes in order to protect future residents from the harmful effects of noise. This guidance can be seen as the missing link between the current NPPF and its predecessor, PPG24 (Planning Policy Guidance 24: Planning and Noise), which provided a prescriptive method for assessing sites for residential development, but without the nuance of 'good acoustic design' as outlined in ProPG.
ProPG allows the assessor to take a holistic approach to consider the site's suitability, taking into consideration numerous design factors which previously may not have been considered alongside the noise level measured on site, for example the orientation of the building in relation to the main source of noise incident upon it.
It should be noted this document is not an official government code of practice, and neither replaces nor provides an authoritative interpretation of the law or government policy, and therefore should be seen as a good practice document only.

2.4 ACOUSTICS VENTILATION AND OVERHEATING

The AVO Guide includes:

- an explanation of ventilation requirements under the building regulations and as described in Approved Document F, along with typical ventilation strategies and associated noise considerations;
- an explanation of the overheating assessment methodology described in CIBSE TM59; potential acoustic criteria and guidance relating to different ventilation and overheating conditions, for both environmental noise ingress and building services noise;
- and a worked example of the application of the AVO Guide including indicative design solutions.

The AVO Guide is intended 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 dwellings in question. Although the policy coverage is limited to England, the approach may be applicable in other parts of the UK.

The AVO Guide is intended to contribute to the practice of good acoustic design, as emphasised in the Professional Practice Guidance on Planning and Noise (ProPG). In particular

2.5 BRITISH STANDARD BS 8233:2014

British Standard Code of Practice BS8233:2014 'Sound insulation and noise reduction for buildings' provides recommended guideline value for internal noise levels within dwellings which are similar in scope to guideline values contained within the World Health Organisation Guidelines for Community Noise 1999 (WHO).

Activity	Location	07:00 to23:00	23:00 to 07:00
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 $L_{Aeq,\ 8hour}$

2.4.1 Indoor ambient noise levels for dwellings

The WHO guideline noise criteria set an internal sleep disturbance noise limit of 45dB LAmax,F which should not be exceeded on a regular basis.

3.0 SITE SURVEYS

3.1 SITE DESCRIPTION

The site is situated on Brighton Road (A259). The area is predominately residential properties. The dominant noise source is road traffic noise from the surrounding roads (See Figure 3.1)

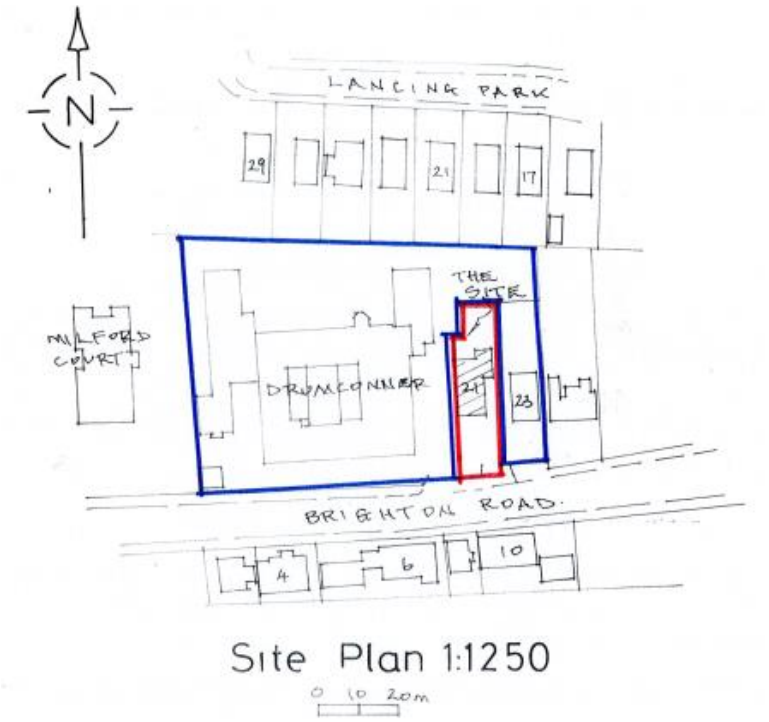


Figure 3.1 – Proposed Site

3.2 ENVIRONMENTAL SITE SURVEY PROCEDURE

In order to characterise the sound profile of the area an environmental sound survey has been carried out from 30/05/2023 to 31/05/2023. The monitoring position was chosen in order to collect representative data for the potential noise break into the habitable rooms.
The monitoring location is shown in Figure 3.2.



Figure 3.2 – Measurement Location

3.3 EQUIPMENT

Instrument manufacturer	**Rion**
Model	**NA-28**
Serial Number	**00392485**
Microphone Type	**UC-59**
Serial Number	**14934**
Calibrator	**NC-74**
Serial Number	**34494274**

The calibration of the sound level meters was verified in-situ before any measurements were taken, using the hand held calibrator and reference tone of 114dB at 1kHz. Validation checks at the end of the survey indicated that all instruments had operated within permitted tolerances for drift and measured level.

Copies of Calibration certificates are available upon request.

3.4 METEOROLOGICAL CONDITIONS

As the environmental noise survey was carried out over a long un-manned period no localized records of weather conditions were taken. However, during the set up and collection of the monitoring equipment, the weather conditions have been documented in the following table. All measurements have been compared with met office weather data of the area, specifically the closest weather station, the data from the weather station is outlined in the table below. When reviewing the time history of the noise measurements, any scenarios that were considered potentially to be affected by the local weather conditions have been omitted. The analysis of the noise data includes statistical and percentile analysis and review of minimum and maximum values, which aids in the preclusion of any periods of undesirable weather conditions. The weather conditions were deemed suitable for the measurement of environmental noise in accordance with BS7445 Description and Measurement of Environmental Noise. The table below presents the average temperature, wind speed and rainfall range for each 24-hour period during the entire measurement.

Weather Conditions –Shoreham Weather station				
Time Period	**Air Temp (◦C)**	**Rainfall mm/h**	**Prevailing Wind Direction**	**Wind Speed (m/s)**
30/05/2023 – 00:00 – 23:59	12 - 18	0.0	NNE	8-16
31/05/2023 – 00:00 – 23:59	14 - 20	0.0	NNE	3-19

Table 3.4 – Weather Summary

4.0 NOISE SURVEY

The following free-field sound levels have been derived for assessment of environmental noise break-in. It shall be noted that the data is 3dB below the information in Appendix A to equate from façade to free-field conditions.
A maximum value is provided for each night-time measurement period. Based on the World Health Organisation interpretation that for a noise to be regular it needs to occur several (i.e. more than two) times per hour; the LAmax(f) noise needs to be based upon an average of 10-15 events that are typical in nature. The aim of protecting against maximum noise levels is to ensure protection against typical intermittent noise levels rather than one-off events; whereby an arithmetic average of the 15 typical maximum events across each night period is used to determine values of dB LAmax(f) reported below. These have been summarised in table 4.1 and 4.2 below.

Measurement Data	Free Field Sound Pressure Level dB		
	MP1		
Time	Average $L_{Aeq,T}$	Maximum $L_{AMAX,(f)}$	Lowest L_{90}
07:00 – 23:00	67dB LAeq,15	83dB $L_{AMAX,15}$	47dB, $L_{90,15}$
23:00 – 07:00	58dB LAeq,15	77dB $L_{AMAX,15}$	42dB, $L_{90,15}$

Table 4.1 Measurement Levels

Leq, ff noise levels are taken as the continuous equivalent free-field sound pressure level outside the room elements under consideration.

Location	T	Time		Free-Field Sound Pressure Level Leq, T dB re.20µPa							
			65Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8KHz	A
MP1	16h	Day	64	70	71	64	61	57	52	47	67
	8h	Night	55	61	62	55	52	48	43	38	58
		LAMax	74	80	81	74	71	67	62	57	77

Table 4.2 Summary of octave -band sound levels for break in assessment

5.0 PROPOSED LAYOUT DESIGN

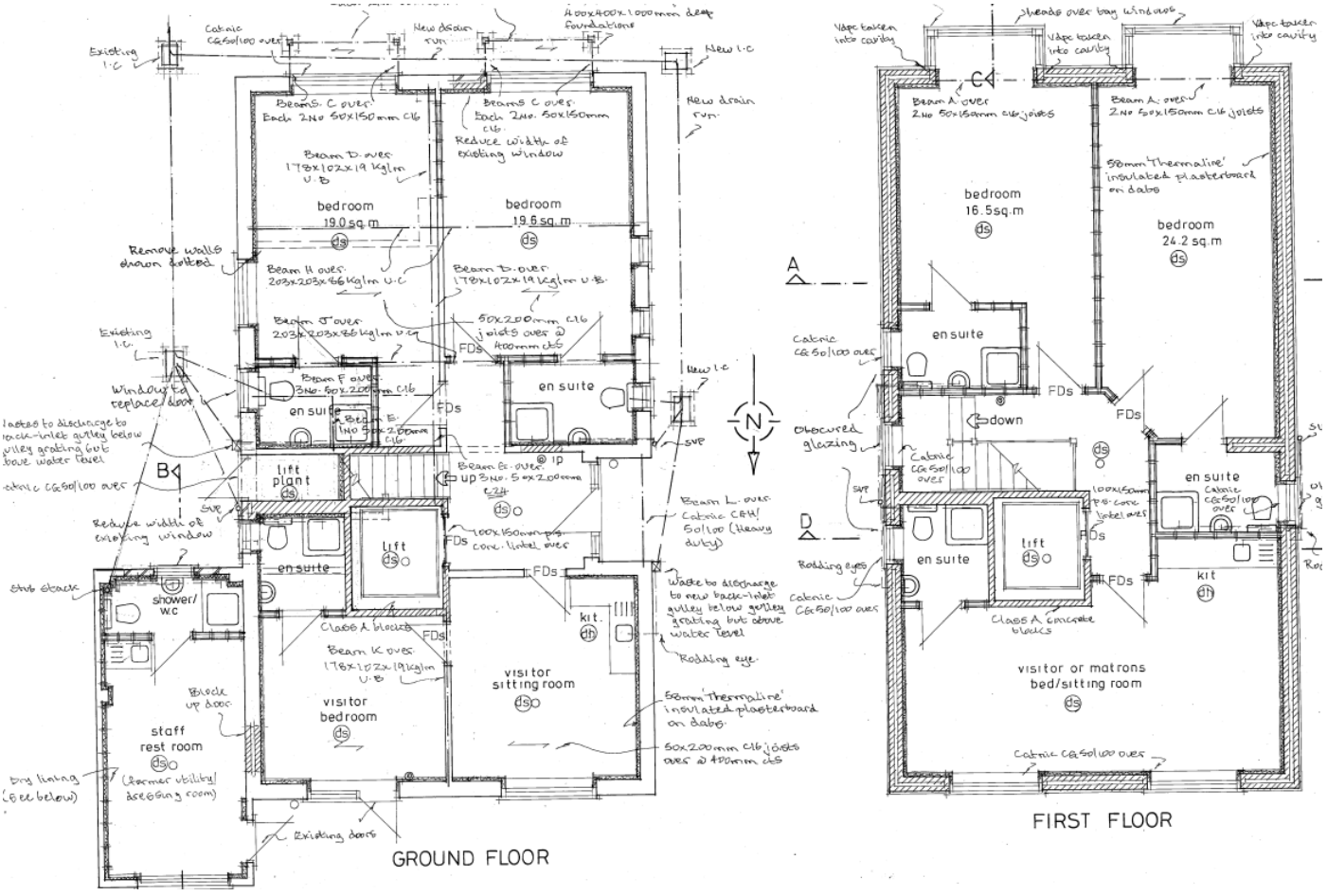


Figure 5.0 - Proposed Layout

5.1 EXTERNAL SOUND LEVELS

It shall be read from Table 4.2 in Section 4.0 of this report, that the external sound levels taken by means of average equivalent or maximum sound levels exceed the World Health Organisation requirements for external noise as described by Community Noise Guidelines (1999) in Section 2.5 of this report.

5.1.1 Pro PG Acoustic Design Statement

The scope of ProPG is restricted to the consideration of new residential development that will be exposed predominantly to airborne noise from transport sources. New apartments, flats and houses are the most common type of new residential development, however the guidance can also be applied to other types of residential developments such as residential institutions, care homes etc. As such it is directly applicable to this development.

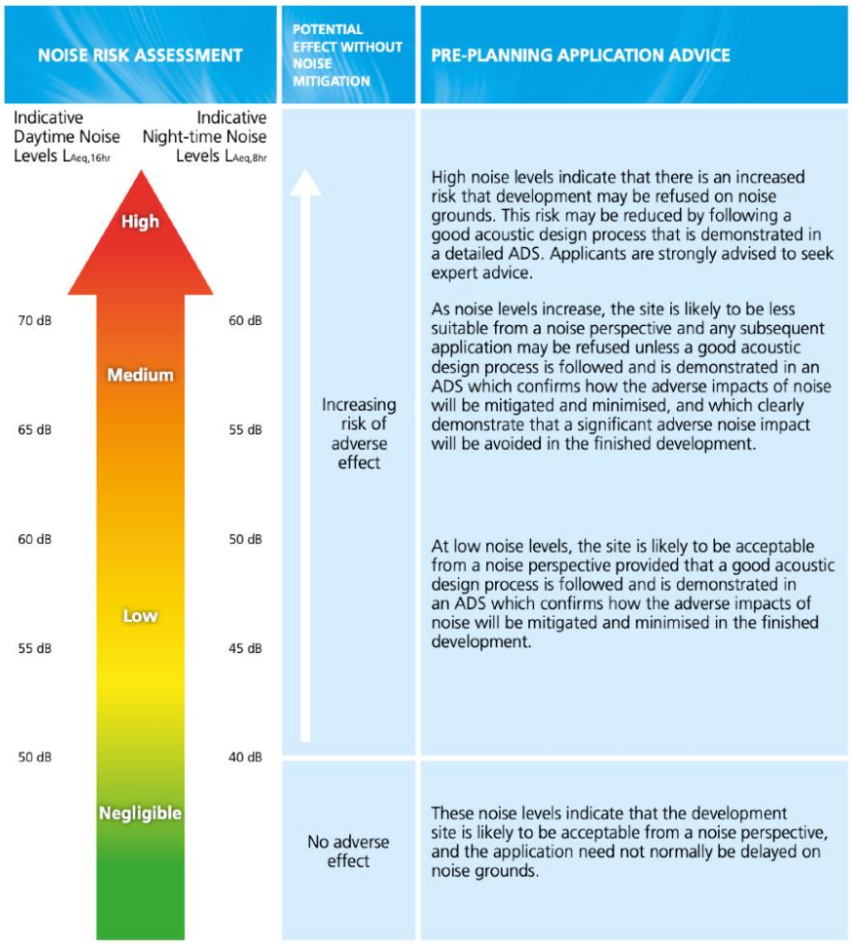


Figure 5.1 - ProPG Noise risk assessment guide

The following table assesses the ProPG noise risk for the measured data. The purpose of this is to provide a view of the noise risk at the site.

	Daytime $L_{Aeq, 16hr}$ 07:00 – 23:00	Night-time $L_{Aeq, 8hr}$ 23:00 – 07:00	Noise Exposure Catergory
Noise Level	67dB	58dB	B
ProPG Noise Risk	MEDIUM	MEDIUM	

Table 5.1.1 : ProPG Stage 1 Assessment table

ProPG states that “Particular care should be taken to ensure that any noise events (as quantified by LAmax,F) have been properly identified and assessed”. On attendance, the greatest LAFMax events were found to be generated by vehicle movements. No other noise source was found to potentially generate comparable LAFMax levels through the night.

5.2. FAÇADE SOUND INSULATION

In accordance with the assessment guidance in Annex G of BS 8233:2014, the sound insulation performance of the building can be estimated by simple calculation from the free-field noise.

CALCULATION		A	B	(A-B) +5
Location	Period	Free-Field Noise Levels LAeq,T dB	BS8233/WHO Internal Noise Guidance Criteria LAeq, T dB	Typical Insulation Specification dB Rw
MP1	**Day 07:00 – 23:00**	**67**	**35**	**37**
	Night 23:00 – 07:00	**58**	**30**	**33**
		77	**45**	**37**

Table 5.2 - Sound insulation estimate using the simple calculation method of BS8233

Following the rigorous calculation method of Annex G of BS 8233:2014, it can be shown that a suitable standard of residential amenity can be achieved with façade sound insulation of standard double glazing (40dB Rw) for the Living Areas and bedrooms.

5.2.1 NON-GLAZED ELEMENTS

The non-glazed external building fabric elements of the proposed development would be comprised of blockwork. This would contribute towards a significant reduction of ambient noise levels in combination with a good quality secondary-glazed window configuration, as shown in Section 5.3.

All non-glazed elements of the building facades should provide a sound reduction performance of at least the figures shown in Table 5.2.1 when tested in accordance with BS EN ISO 140-3:1995.

Element	Octave Band Centre Frequency SRI, dB					
	125	250	500	1K	2K	4K
Non Glazed Element SRI	41	45	45	54	58	60

Table 5.2.1 Non-glazed elements sound reduction minimum performance

5.3 SPECIFICATION OF GLAZED UNITS

The minimum sound reduction index (SRI) value required for the glazed elements to be installed is shown in Table 5.3

Glazing Configuration – 6.38mm/12mm /10.36mm LamiGlass							
Frequency, Hz/dB					Rw	Rw+C	Rw + Ctr
125	250	500	1K	2K	**40**	-1	-4
29	30	38	42	47			

Table 5.3 – Required Glazing Performance

The sound reduction performance stated above must be achieved by the gazing system as a whole in its installed condition. The specification therefore applies to both the glazing element and all seals on any openable part of the system. It should be confirmed with any supplier that the full glazing system supplied complies with the requirements stated in Table 5.3. Data has been used from Guardian Glass. (See Appendix C)

5.4 CALCULATION RESULTS

For the daytime assessment for living areas, the desirable limit of BS8233:2014 suggests a guideline of 35 dB LAeq,16hr for resting conditions, and up to 40 dB is considered acceptable for necessary developments.
All results, with the proposed construction, would place the internal levels in kitchen/living areas as below 35 dB, therefore within the desirable category.
For the night-time assessment for bedrooms, BS8233:2014 suggests a desirable guideline of 30 dB LAeq, 8hr for sleeping conditions, with an acceptable limit of 35 dB LAeq, 8hr. Individual noise events (Measured with fast time-weighted Maximum) should not normally exceed 45 dB LAFmax (as in BS8233:1999).
The proposed construction would place the internal continuous levels in bedrooms as below 30 dB and the maximum noise events as typically below 45 dB LAFmax, therefore within the desirable category.

Monitoring Period	Calculated Internal Noise Levels	Noise Criteria
07:00 – 23:00	34 dB LAeq(16hr)	35 dB
23:00 – 07:00	26 dB LAeq(8hr)	30 dB

Table 5.4 –Internal Noise Levels LAeq Calculations

Monitoring Period	Noise Criteria L_{AMAX}	No. times exceeded L_{AMAX}
07:00 – 23:00	55dB	5
23:00 – 07:00	45dB	5

Table 5.4.1 – Noise Criteria L_{AMAX}

6.0 VENTILATION

Guidance on ventilation and associated acoustic considerations is given in Acoustic Ventilation and Overheating – Residential Design Guide [AVO] issued jointly by the Association of Noise Consultants and the Institute of Acoustics. In this guide, the need for ventilation (as falls under the requirements of Approved Document F [ADF] are covered in three main requirements as follows:

- Whole Dwelling Ventilation - General ventilation – continuous ventilation of rooms or spaces at a relatively low rate

- Extract Ventilation - Removal of air from a space or spaces (typically stale air from bathrooms or kitchens) to outside

- Purge Ventilation - Manually controlled removal of air at a high rate to eliminate fumes and odours, e.g. during painting and decorating or from burnt food. May be provided by natural or mechanical means.

Four main template systems for providing each of the above ADF ventilation requirements are summarised in the AVO guide as shown in Table 6.0.

Ventilation System	Method Of Whole Dwelling Ventilation	Method of Extract Ventilation	Method of purge Ventilation
System 1 (Background Ventilators and intermittent extract Fans	Background ventilators (Trickle Vents)	Intermittent extract fans	Typically provided by opening windows
System 2 (Passive Stack)	Background ventilators (Trickle Vents) & Passive Stack	Continuous via passive stack	Typically provided by opening windows
System 3 (Contunuous Mechanical Extract (MEV)	Continuous mechanical extract (low rate), trickle vents provide fresh air	Continuous mechanical extract (high rate), trickle vents provide fresh air	Typically provided by opening windows
System 4 (Continuously mechanical supply and extract with heat recovery (MVHR)	Continuous mechanical supply and extract (low rate)	Continuous mechanical supply and extract (high rate)	Typically provided by opening windows

Table 6.0 – Summary of ADF Ventilation Requirements

Where possible, natural forms of ventilation are typically preferred. However, in high noise areas, it may be necessary to recommend System 4, in order to minimise penetrations through the external building façade, which weaken the overall sound reduction performance.

The Below Table outlines the appropriate ventilation strategies for this development.

Ventilation Strategy (according to ADF)		
System 1: Intermittent Extract Fans System 2: Passive Stack Ventilation	✗	✗
System 3: Continuous Mechanical Extract (MEV)	✓	✓
System 4: Continuous Mechanical Supply & Extract with Heat Recovery (MVHR)	✓	✓

Table 6.0.1 – Ventilation Options

Building Regulations Part F - System 3

If System 3 (MEV) is used to provide fresh air through (background) trickle ventilators, the trickle ventilators shall be acoustically treated to achieve the following performance;

Calculations were carried out using Acoustic Trickle vents. Details Below:

Dn,e dB					
Frequency, Hz/dB					$D_{,n.e}$
125	250	500	1K	2K	**40**
40	40	38	40	40	

Table 6.0.2 - Required ventilator performance

Building Regulations Part F - System 4

Mechanical Ventilation with Heat Recovery (MVHR) would be to provide each flat with whole house supply and extract ventilation. This comprises of mechanical unit/s that provide both supply and extract to each apartment individually; whereby inlet and outlet ducts would need to be run to the façade or in a riser to the roof. This type of system can also be incorporated with heat recovery built in if desired.

It should be ensured that all mechanical extract ventilation is designed to not exceed the internal noise criteria stated in Table 2.4.1.

6.1 OVERHEATING

The advice in this section has considered the internal ambient noise level with closed windows. The AVO guide requires that consideration has also been given to the overheating condition. With an advocated and simplistic insertion loss of 13 dB from external to internal areas with an open window. It has been noted from the AVO guide, that a material change in behaviour may occur with internal ambient noise levels of > 50 dB LAeq, T (07:00 – 23:00) during the day, > 42 dB LAeq, T or > 65 dB LAmax(F) (23:00 – 07:00) during the night.

Level 1 Risk Assessment following the AVO Guide		Internal Ambient Noise Level dB re. 20µPa		
Windows	Ventilation State	Day dB LAeq,T	Night dB LAeq,T	Max dB LAeq,T
Windows closed and ventilators open	Building Ventilation	34	26	45
Windows partially open	Overheating Ventilation	54	44	63

Table 6.1 – IANL

A Level 2 Risk Assessment has been undertaken.
The maximum window opening areas permissible to avoid exceeding the proposed performance standards have been calculated, as a % of the floor area, and are presented in Table 6.1.1 below.

Façade	Maximum Window Opening
Front	**2% (S)**

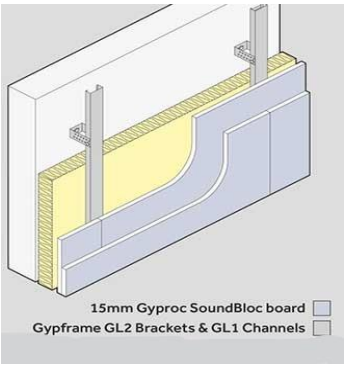
Table 6.1.1 – Maximum Window Opening Area

7.0 RESIDENTIAL SOUND INSULATION REVIEW

The party wall structure may be subject to pre-completion testing in accordance with requirements of The Building Regulations 2010 Approved Document E (2003 Edition & amendments).

7.1 PARTY WALLS

Separating walls are to be built as British Gypsum Quiet Wall, high performance acoustic wall system. Mineral wool infill to be a minimum of 50mm Rw45. (See Detail Below).



Alternatively, 75mm CLS stud wall with a 75mm cavity can be erected and secured via the ceiling joist and floor joist but not the party wall directly. The wall must sit on a 15mm strip of Soundbloc Plasterboard (Blue Board) between floor and ceiling to act as a deflection strip and minimise flanking noise. The cavity must be insulated with Rw45/50mm Mineral wool with 45kg/m3 density and left with a clear 25mm airgap. Fitting of one side of the party wall would be sufficient on solid construction.

8.0 SUMMARY AND CONCLUSIONS

A baseline noise survey has been undertaken by DAA Group to establish the prevailing noise climate in the locality of 21 Brighton Road, Lancing, BN15 8RJ in support of a planning application for a new residential development.

The measured levels have been assessed against currently available standards and guidance documents including The National Planning Policy Framework 2021 (NPPF), National Planning Practice Guidance (NPPG) and Local Authority requirements.

Appropriate external and internal noise criteria have been considered to minimise adverse impacts on health and quality of life as a result of the new development.

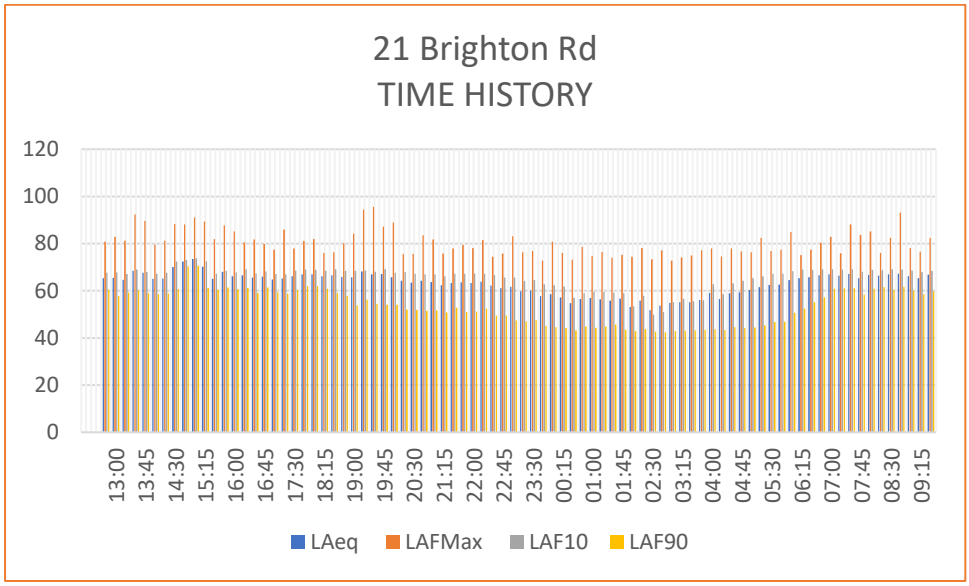
Appropriate mitigation measures have been outlined including double-glazing and mechanical ventilation.

A sound insulation scheme has been included.

ProPG assessment levels indicate a medium noise risk.

It is concluded that, on noise grounds, the proposed development will not prejudice the amenities of any future occupants provided the above points are taken into consideration.

APPENDIX A – MEASUREMENTS



APPENDIX B - ACOUSTIC TERMINOLOGY

B.1 WEIGHTED DECIBEL, dB(A)

The unit generally used for measuring environmental, traffic or industrial noise is the A-weighted sound pressure level in decibels, denoted dB(A). The weighting is based on the frequency response of the human ear and has been found to correlate well with human subjective reactions to various sounds. An increase or decrease of approximately 10 dB corresponds to a subjective doubling or halving of the loudness of a noise, and a change of 2 to 3 dB is subjectively barely perceptible.

B.2 EQUIVALENT CONTINUOUS SOUND LEVEL, LAeq

Another index for assessment for overall noise exposure is the equivalent continuous sound level, L_{Aeq}. This is a notional steady level which would, over a given period, deliver the same sound energy as the actual time-varying sound over the same period.

B.3 MAXIMUM NOISE LEVEL, LAmax

The maximum noise level identified during a measurement period. Experimental data has shown that the human ear does not generally register the full loudness of transient sound events of less than 125 ms in duration.

B.4 NOISE RATING, NR

Noise ratings are used as a single figure criterion for specifying services noise in buildings. Each noise rating value has an associated spectrum of defined values in each third or octave frequency band. To determine the noise rating of a room the measured spectrum is compared to a set of noise rating curves. The highest NR curve that crosses any single frequency band of the measurement determines the noise rating for the room. The single figure noise rating is read at the 1 kHz band.

B.5 SOUND LEVEL DIFFERENCE (D)

The sound insulation required between two spaces may be determined by the sound level difference needed between them. A single figure descriptor which characterises a range of frequencies, the weighted sound level difference, D, is sometimes used (BS EN ISO 717-1). This parameter is not adjusted to reference conditions.

The standardized level difference, Dn, T is a measure of the difference in sound level between two rooms, in each frequency band, where the reverberation time in the receiving room has been normalised to 0.5 s. This parameter measures all transmission paths, including flanking paths.

The weighted standardized level difference, DnTw, is a measure of the difference in sound level between two rooms, which characterises a range of frequencies and is normalised to a reference reverberation time

B.6 SOUND REDUCTION INDEX (R)

The sound reduction index (or transmission loss) of a building element is a measure of the loss of sound through the material, i.e. its attenuation properties. It is a property of the component, unlike the sound level difference which is affected by the common area between the rooms and the acoustic of the receiving room. The weighted sound reduction index, Rw, is a single figure description of sound reduction index characterising a range of frequencies, which is defined in BS EN ISO 717-1: 1997. The Rw is calculated from measurements in an acoustic laboratory

B.7 STATISTICAL NOISE LEVELS (L_{A90}, (T) L_{A1}, (T) L_{A10}, (T) etc.)

For levels of noise that vary widely with time, for example road traffic noise, it is necessary to employ an index which allows for this variation. The L_{A10} is the level exceeded for ten per cent of the time under consideration, has historically been
adopted in the UK for the assessment of road traffic noise. The LA90 is the level exceeded for ninety per cent of the time, has been adopted to represent the background noise level. The L_{A1} the level exceeded for one per cent of the time, is representative of the maximum levels recorded during the sample period. A weighted statistical noise levels are denoted LA10, dB LA90, dB. etc. The reference time (T) is normally included, e.g. LA10, (5min), & LA90, (8hr).

B.8 TYPICAL NOISE LEVELS

Typical noise levels are given in the following table.

Noise Level dB(A)	Example
130	Threshold of pain
120	Jet aircraft take-offs at 100 m
110	Chain saw at 1 m
100	Inside disco
90	Heavy lorries at 5 m
80	Kerbside of busy street
70	Loud radio (in typical domestic room)
60	Office or restaurant
50	Domestic fan heaters at 1m
40	Living room
30	Ventilation Noise in Theatre
20	Remote countryside on still night
10	Sound insulated test chamber
0	Threshold of hearing.

GUARDIAN GLASS

Acoustic Performance

Glazing Configuration

6.38mm (33.1) LamiGlass (PVB)

12mm Cavity

10.38mm (64.1) LamiGlass (PVB)

Sound Reduction Indices

Frequency, Hz / dB						Rw	C	Ctr	OITC	STC
125	250	500	1000	2000	4000	40	-1	-4	35	40
29	30	38	42	47	60					

Disclaimer: The acoustic performance data provided in the reports is based on a test protocol or an estimation and may be used if user actual glazing is identical to input data described herein. Acoustic performance data herein is only applicable for glazing dimensions 1,23 m x 1,48 m (as per testing standard). Estimation of acoustic performance is based on component-similarity assumptions which are derived from measured data and interpolation to expand the database of values from test protocols. Due to inherent variations in acoustic performance when testing in accordance with EN ISO 10140-3/EN ISO 10140-2, some variation in the calculated performance can also be expected. As such, the weighted performance, Rw, and adaptation terms, C and Ctr, should typically be considered to be accurate within ±2 dB. However, wider deviations can occur. Actual performance may vary according to the glazing dimensions, frame system, noise sources and many other parameters. The acoustic performance data herein should not be used as a substitute for tests of actual glazing. For more information please consult Assumptions and Terminology section in Guardian Acoustic Assistant. <P>By accessing this calculator, you agree not to alter or modify the generated report data and information, by any means. Any manual alteration will be your own responsibility and will annul all the content of the report.<P>

Wednesday, June 14, 2023 | Acoustic database 20210629 | ASSUMPTION

Calculation Sheet
MP1 - 07:00 - 23:00 to LR

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Noise Source										
Noise Source - MP1 - 07:00 - 23:00										
Noise Levels		**64.0**	**70.0**	**71.0**	**64.0**	**61.0**	**57.0**	**52.0**	**47.0**	**67.3 dBA**
Composite SRI										
Facade Width (m)	4.0									
Facade Height (m)	3.0									
Main Element - External Wall										
SRI		-	41	43	48	50	55	55	-	Rw 51
Window Width (m)	1.5									
Window Height (m)	1.0									
No. of Windows (no)	2.0									
Glazed Element - 40Rw										
SRI		-	29	30	38	42	47	60	-	Rw 41
No. of Vents (no)	2.0									
Vent - Vents										
Dne		40	40	38	40	40	40	40	40	Dnew 41
		-	*-32.7*	*-32.6*	*-36.6*	*-37.2*	*-37.6*	*-37.7*	-	
10 log (S/A)										
Internal Receiver - LR										
		-	*-1.1*	*-1.1*	*-1.1*	*-1.1*	*-1.1*	*-1.1*	-	
+3										
		-	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	-	
Internal Receiver Noise										
Internal Receiver Noise - LR										
Reverberant Field, LPrev		-	**39.2**	**40.3**	**29.3**	**25.7**	**21.3**	**16.2**	-	**34.3 dBA**

Calculation Sheet
MP1 23:00 - 07:00 to BR

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Noise Source										
Noise Source - MP1 23:00 - 07:00										
Noise Levels		**55.0**	**61.0**	**62.0**	**55.0**	**52.0**	**48.0**	**43.0**	**38.0**	**58.3 dBA**
Composite SRI										
Facade Width (m)	3.0									
Facade Height (m)	3.0									
Main Element - External Wall										
SRI		-	41	43	48	50	55	55	-	Rw 51
Window Width (m)	1.5									
Window Height (m)	1.0									
No. of Windows (no)	1.0									
Glazed Element - 40Rw										
SRI		-	29	30	38	42	47	60	-	Rw 41
No. of Vents (no)	2.0									
Vent - Vents										
Dne		40	40	38	40	40	40	40	40	Dnew 41
		-	*-33.0*	*-32.5*	*-35.8*	*-36.2*	*-36.4*	*-36.5*	-	
10 log (S/A)										
Internal Receiver - BR										
		-	*-1.1*	*-1.1*	*-1.1*	*-1.1*	*-1.1*	*-1.1*	-	
+3										
		-	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	-	
Internal Receiver Noise										
Internal Receiver Noise - BR										
Reverberant Field, LPrev		-	**29.9**	**31.4**	**21.1**	**17.7**	**13.5**	**8.4**	-	**25.7 dBA**

Calculation Sheet

MP1 LAMAX to BR

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Noise Source										
Noise Source - MP1 LAMAX										
Noise Levels		**74.0**	**80.0**	**81.0**	**74.0**	**71.0**	**67.0**	**62.0**	**57.0**	**77.3 dBA**
Composite SRI										
Facade Width (m)	3.0									
Facade Height (m)	3.0									
Main Element - External Wall										
SRI		-	41	43	48	50	55	55	-	Rw 51
Window Width (m)	1.5									
Window Height (m)	1.0									
No. of Windows (no)	1.0									
Glazed Element - 40Rw										
SRI		-	29	30	38	42	47	60	-	Rw 41
No. of Vents (no)	2.0									
Vent - Vents										
Dne		40	40	38	40	40	40	40	40	Dnew 41
		-	*-33.0*	*-32.5*	*-35.8*	*-36.2*	*-36.4*	*-36.5*	-	
10 log (S/A)										
Internal Receiver - BR										
		-	*-1.1*	*-1.1*	*-1.1*	*-1.1*	*-1.1*	*-1.1*	-	
+3										
		-	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	-	
Internal Receiver Noise										
Internal Receiver Noise - BR										
Reverberant Field, LPrev		-	**48.9**	**50.4**	**40.1**	**36.7**	**32.5**	**27.4**	-	**44.7 dBA**