AIRTIGHT & NOISECHECK LIMITED

Gat 2 | Meadows Farm | Ervills Road | Worlds End | Hampshire | PO7 4QU
Phone: 034 5066 6966 Email: office@airtightnoisecheck.co.uk

ACOUSTIC TESTING REPORT NO: 1623 PREPARED FOR

ECO INN LTD
37 RICHMOND ROAD
WORTHING
WEST SUSSEX
BN11 1PW

SITE ADDRESS

37 RICHMOND ROAD
WORTHING
WEST SUSSEX
BN11 1PW

REPORT DATE: 19TH OCTOBER 2023

Acoustic Engineer: [redacted] Date: 18th October 2023

Michael Vine

AIRTIGHT & NOISECHECK BUILDING ACOUSTIC TESTING

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Customer Name: Test Date: 18th October 2023

Eco Inn Ltd
37 Richmond Road
Worthing
West Sussex
BN11 1PW

Site Address:

37 Richmond Road
Worthing
West Sussex
BN11 1PW

Acoustic Engineer:

Mr. Michael Vine

Equipment used:

Norsonic Environmental Analyser 121 – serial No 31375, Cal due March 2024

Analyser complies with the following standards:

IEC 60651 type 1
IEC 60804 type 1
IEC 61260 class 1
IEC 225
ANSI S1.4-1985 type 1
ANSI1.43 -1997 type 1
ANSI S1.11-1986 order 3type1D
DIN 45 657
Norsonic Production Standard set for the Nor121.

Measurement Microphones – Gras 40AF, serial No 62522 – calibration due March 2024

Acoustic Calibrator - (Type 1251) – Serial No 31652, Calibration due December 2023

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Measurement Procedure:

The internal ambient noise levels were recorded for a 3hour period in one location on Wednesday 18th October 2023 to measure the noise levels in the noise sensitive rooms at ground floor level of the newly converted hotel.

The above methodology was discussed with the LPA, with the criteria for the calculations as shown below:

$L_{Aeq\ 16hour}$ = 0.99 x LA10, 18hour + 1.44

$L_{Aeq\ 8hour}$ = 0.90 x LA10, 18hour - 3.77

These equations were taken from TRL Project Report PR/SE/451/02 CONVERTING THE UK TRAFFIC NOISE INDEX $L_{A10,18h}$ TO EU NOISE INDICES FOR NOISE MAPPING Prepared for DEFRA 2002

$L_{10\ (3hour)}$ -1dB =$L_{10\ (18hour)}$

Planning approval for a change of use to a 9no room guest accommodation use (ADWM/1111/23) has been granted subject to condition; this report relates to the following condition as shown below:

Works for the implementation of the development hereby approved shall not commence until a scheme for protecting the proposed noise sensitive development from external noise, and also guests from internal noise sources, has been submitted to and approved in writing by the local planning authority. The scheme shall have regard to the principles of BS8233 2014. Following approval and completion of the necessary works a test shall be undertaken to demonstrate that the attenuation measures proposed in the scheme are effective and will protect the guests from unacceptable noise levels.

Reason: *To protect future occupiers from noise disturbance in accordance with The National Planning Policy Framework and Worthing Local Plan Policies H18 and RES7.*

This assessment relates to Condition shown above as the development has now been completed.

This assessment (number 1623) is an internal validation assessment with the microphone placed inside the noise sensitive ground floor bedroom No4. All noise sensitive bedrooms are located to the rear of the building and as such this is where the microphone was positioned.

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Executive Summary:

1.1 Airtight & Noisecheck Ltd were instructed by Eco Inn Ltd to undertake a detailed Noise Impact Assessment (NIA) at 37 Richmond Road, Worthing. A planning application has been granted to convert the current building into a guest accommodation building with 9no rooms, over the ground & 1st floors, with 5 rooms on the ground floor and 4 at 1st floor level with 2 rooms having mezzanine levels into the roof void.

The noise levels were measured for a 3hour period inside the Ground Floor bedroom. The rooms are located to the rear of the building and therefore predominantly screened from the road traffic. The noise sources in the vicinity of the building are:

1. Road Traffic Noise from the local road network (London Road to the North, Grosvenor Road to the South, Portland Road to the East & Grafton Road to the West).

All roads are located beyond the other buildings in the vicinity and therefore the building is predominantly screened from the road noise by other buildings and the building fabric. There is also a children's nursery located immediately to the rear of the building.

The internal levels were measured to ensure the mitigation measures installed achieved the internal acoustic criteria as set out in Condition No 5 of the planning application and BS8233: 2014.

The noise levels indicate that the desired acoustic criteria have been achieved at the site. The measured levels are below the upper limits as shown in the table below.

BS8233: Table 5 – Indoor Ambient noise levels in spaces when they are unoccupied.

Activity	Location	0700-2300	2300-0700
Resting	Living Rooms	35dB LAeq,16hour	-
Dining	Dining Room/Area	40dB LAeq,16hour	-
Sleeping (daytime resting)	Bedroom	35dB LAeq,16hour	30dB LAeq,8hour

The internal levels were measured in the noise sensitive rooms.

As previously stated the assessment took place over a 3hour period, with bespoke calculations for road noise used to determine the $L_{Aeq\ 16hour}$ and $L_{Aeq\ 8hour}$ values, this methodology was agreed with the LPA prior to commencement.

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Assessment Criteria:

The National Planning Policy Framework (NPPF) came into effect in March 2012 and was updated published in July 2021. It replaced other documents such as PPG24. The NPPF provides several objectives and aims that are directed towards avoiding significant adverse impacts and reducing others on quality of life and health. This document states that:

Paragraph 174 states Planning policies and decisions should contribute to and enhance the natural and local environment by:

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, considering relevant information such as river basin management plans.

Paragraph **185.** Planning policies and decisions should also ensure that new development is appropriate for its location considering the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

(a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life [65];
(b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.

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

The Planning Practice Guidance has guidance on noise, date 22nd July 2019 and has the noise hierarchy table as shown below. Paragraphs 009 & 011 are refenced later in this report.

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

NOEL – No Observed Effect Level 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 noise.

LOAEL – Lowest Observed Adverse Effect Level This is the level above which adverse effects on health and quality of life can be detected.

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

The NPSE (Noise Policy Statement for England) states the following aims with respect to noise policy:

Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of the Government policy on sustainable development:

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.

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PROPG: PLANNING & NOISE (2017) NEW RESIDENTIAL DEVELOPMENT [PROPG 2017]

The ProPG Planning & Noise document was published in 2017, its development supported by the Institute of Acoustics, the Association of Noise Consultants, and the Chartered Institute of Environmental Health. The aim of the document is to provide practitioners with guidance on a recommended approach to the management of noise within the planning system in England.

ProPG advocates a systematic, proportionate risk-based, 2 stage approach which:

1. Encourages early consideration of noise issues;
2. Facilitates straightforward accelerated decision making for lower risk sites;
3. Assists proper consideration of noise issues where the acoustic environment is challenging.

A summary of the overall ProPG approach is included in Appendix B. The two sequential stages of the overall approach are:

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

The four key elements to be undertaken in parallel during Stage 2 are:

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

The approach is underpinned by the preparation and delivery of an "Acoustic Design Statement" [ADS]. The ADS is intended to conclude in the provision of one of the following four recommendations to the decision maker:

1. Planning consent may be granted without any need for noise conditions;
2. Planning consent may be granted subject to the inclusion of suitable noise conditions;
3. Planning consent should be refused on noise grounds to avoid significant adverse effects ("avoid"); or
4. Planning consent should be refused on noise grounds to prevent unacceptable adverse effects ("prevent").

The overall ProPG 2017 approach is intended for implementation with projects at an earlier stage than the subject of this report. This report provides a full noise mitigation strategy for the site, rather than an initial recommendation to the decision maker.

ProPG 2017 contains the most up to date guidance available on industry-wide adopted best-practise interpretation of relevant guidance regarding acceptable internal and external noise levels i.e., BS8233:2014 and WHO Guidelines.

WHO GUIDELINES FOR COMMUNITY NOISE (1999)

The guidance in this document recommends design criteria for internal noise levels within residential and commercial buildings. A summary of the recommended guidance is shown in Table 2.1. from the WHO Guidance

Criterion	Environment	Design range LAeq,T dB
Maintain speech intelligibility, avoid moderate annoyance, daytime & evening	Living Rooms	35
Prevent sleep disturbance, nighttime	Bedrooms	30

This guidance also states:

For a good sleep, it is believed that indoor sound pressure levels should not exceed approximately 45dB L_{Amax} more than 10-15 times a night (Vallet & Vernet 1991)

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For outdoor living areas, it is stated that:

To protect the majority of people from being seriously annoyed during the daytime, the outdoor sound level from steady, continuous noise should not exceed 55dB L_{Aeq} on balconies, terraces and in outdoor living areas. To protect most people from being moderately annoyed during the daytime, the outdoor sound level should not exceed 50dB L_{Aeq}. Where it is practical and feasible, the lower outdoor sound level should be considered the maximum desirable sound level for new development.

BS8233:2014 GUIDANCE ON SOUND INSULATION AND NOISE REDUCTION FOR BUILDINGS

The guidance in this document indicates acceptable noise levels for various activities within residential dwellings. A summary of the recommended guidance is shown in the following table as listed in Table 4 of BS8233: 2014

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living Room	35 dB LAeq, 16 hour	-
Dining	Dining Room	40 dB LAeq, 16 hour	-
Sleeping (daytime resting)	Bedroom	35 dB LAeq, 16 hour	30 dB LAeq, 8 hour

Please Note – for the purposes of this report, the only criteria applicable is the table shown above as listed on BS8233: 2014 and as stated in condition 5 within the preoccupation planning conditions as stated by the local authority.

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1 Objective:

1.2 To determine if the required internal acoustic criteria has been achieved after the building being converted and suitable building elements installed. The building has been completed with robust and comprehensive measures.

1.3 The internal noise levels were measured for the 3hour assessment period.

2 Calibration:

2.1 The measurement microphones were calibrated before and after testing in each measurement location and there were no drifts recorded during the assessments.

3 Site Layout & Microphone Position:

3.1 The proposed site is located to the South of Richmond Road & North of Grosvenor Road within a primarily residential with residential dwellings located on all sides. There are commercial buildings located along Richmond Road and a children's nursery located immediately to the South of the building. The immediate area is residential.

3.2 The development comprises of guest accommodation with 9no rooms, 5 on the ground floor and 4 on the 1st floor with two having mezzanine levels. The building has been converted and ready for occupation. The microphone was located:

1- Noise sensitive bedroom at ground floor level – room number 4. The microphone was positioned in the centre of the room, and it was at least 1.2m from ground level.

4 Weather Conditions:

4.1 During the assessment period, the weather was dry during the measurement procedures, there was some rain later in the day. The temperatures ranged between 12 & 18 degrees.

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5 Results:

5.1 The purpose of this measurement procedure was to calculate the noise levels apparent within the noise sensitive room & amenity space & to ensure the requirements of BS8233: 2014 & the LPA condition.

Calculation Methodology:

$L_{Aeq\ 16hour}$ = 0.99 x LA10, 18hour + 1.44

$L_{Aeq\ 8hour}$ = 0.90 x LA10, 18hour - 3.77

These equations were taken from TRL Project Report PR/SE/451/02 CONVERTING THE UK TRAFFIC NOISE INDEX LA10,18h TO EU NOISE INDICES FOR NOISE MAPPING Prepared for DEFRA 2002

L10 (3hour) -1dB =L10 (18hour)

Therefore:

$L_{Aeq\ 16hour}$ = 0.99 x $L_{A10,\ 18hour}$ (28) + 1.44 = 29dBA

$L_{Aeq\ 8hour}$ = 0.90 x $L_{A10,\ 18hour}$ (28) - 3.77 = 21dBA

These equations were taken from TRL Project Report PR/SE/451/02 CONVERTING THE UK TRAFFIC NOISE INDEX LA10,18h TO EU NOISE INDICES FOR NOISE MAPPING Prepared for DEFRA 2002

$L_{10\ (3hour)}$ = 29dBA -1dB =$L_{10\ (18hour)}$ = 28dBA

Mic Location	$L_{Aeq\ 16hour}$ Value	Criteria Achieved	$L_{Aeq\ 8hour}$ Value	Criteria Achieved
ML 1 – GF Bedroom	29dBA	Yes	21dBA	Yes

6 Results Conclusion:

6.1 The measured and calculated levels achieve the required acoustic criteria as stated in the condition of the planning application. Therefore, the future residents of the guest accommodation can ensure a suitable standard of living by way of acoustic comfort.

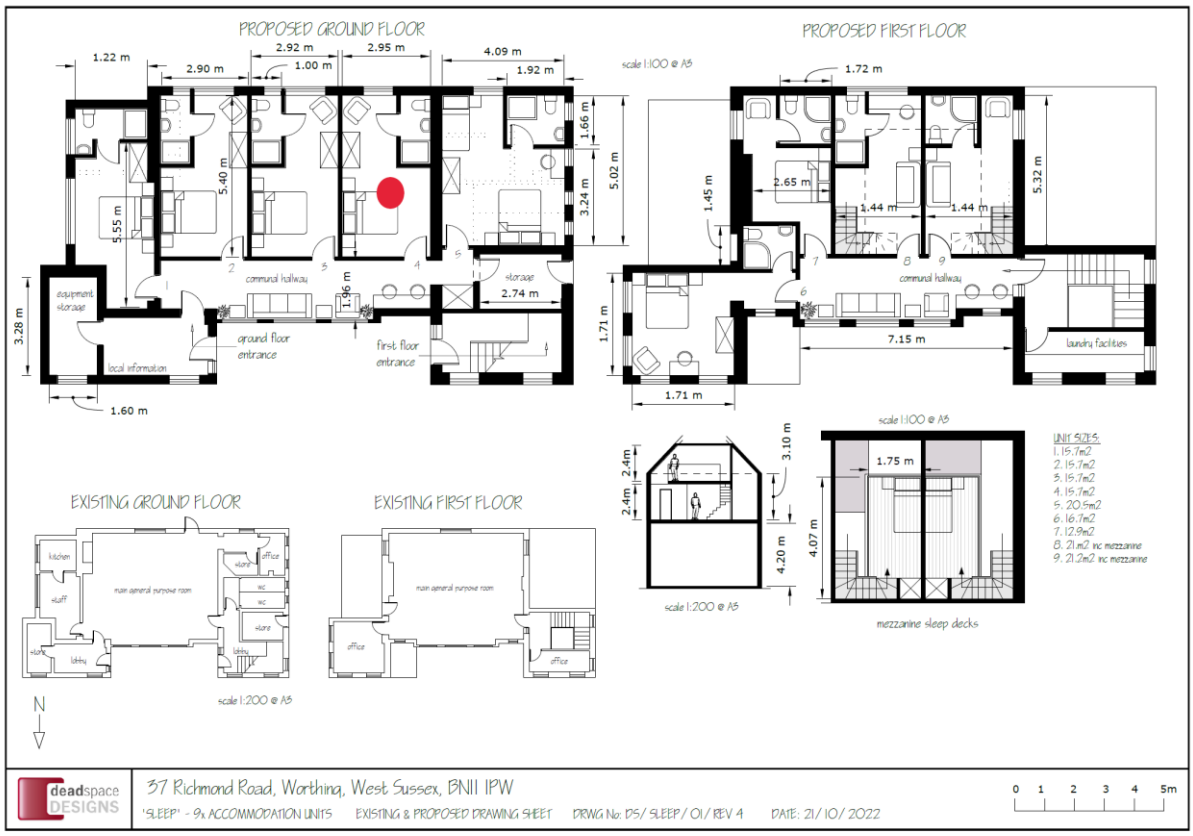
6.2 The internal levels were taken in the bedroom, and all bedrooms are in the same location and as such the internal level should be similar in all rooms.

7 Results Summary:

7.1 The measured levels at the site indicate that the required sound reduction measures applied to the building elements have ensured that the acoustic criteria for the guest bedrooms have been achieved and therefore the relative condition has been met. No further works are required to reduce the acoustic noise levels at the site, and it is anticipated that the future occupants can be ensured of a good standard of living by way of acoustic criterion.

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9 **Site Plans:**



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APPENDIX

Continuous equivalent noise level, LAeq — The steady noise level (usually in dBA) which, over the period of time under consideration, contains the same amount of sound energy as the time varying noise.

LAmax - The maximum value that the A-weighted sound pressure level reaches during a measurement period.

dB (A) — The A-weighted sound pressure level.

Decibel (dB) — A unit used for many acoustic qualities to indicate the level of sound with respect to a reference level.

A-weighting — A frequency weighting that relates to the response of the human ear.

Background noise level — Prevailing noise level in a specified environment measured in the absence of the noise being studied.

Habitable Room – A room used for sleeping or recreation/relaxation.

Dne,w Weighted element normalised level difference – A single-number quantity which characterises the airborne sound insulation of a small building elements.

EPU – Environmental Protection Unit

Rw Weighted sound reduction index – A single-number quantity which characterises the airborne sound insulation of a material or building element measured in the laboratory.

LA10 – The A-weighted noise level exceeded for 10% of the measurement duration.

LA90 - The A-weighted noise level exceeded for 90% of the measurement duration.

British Standards & associated documents:

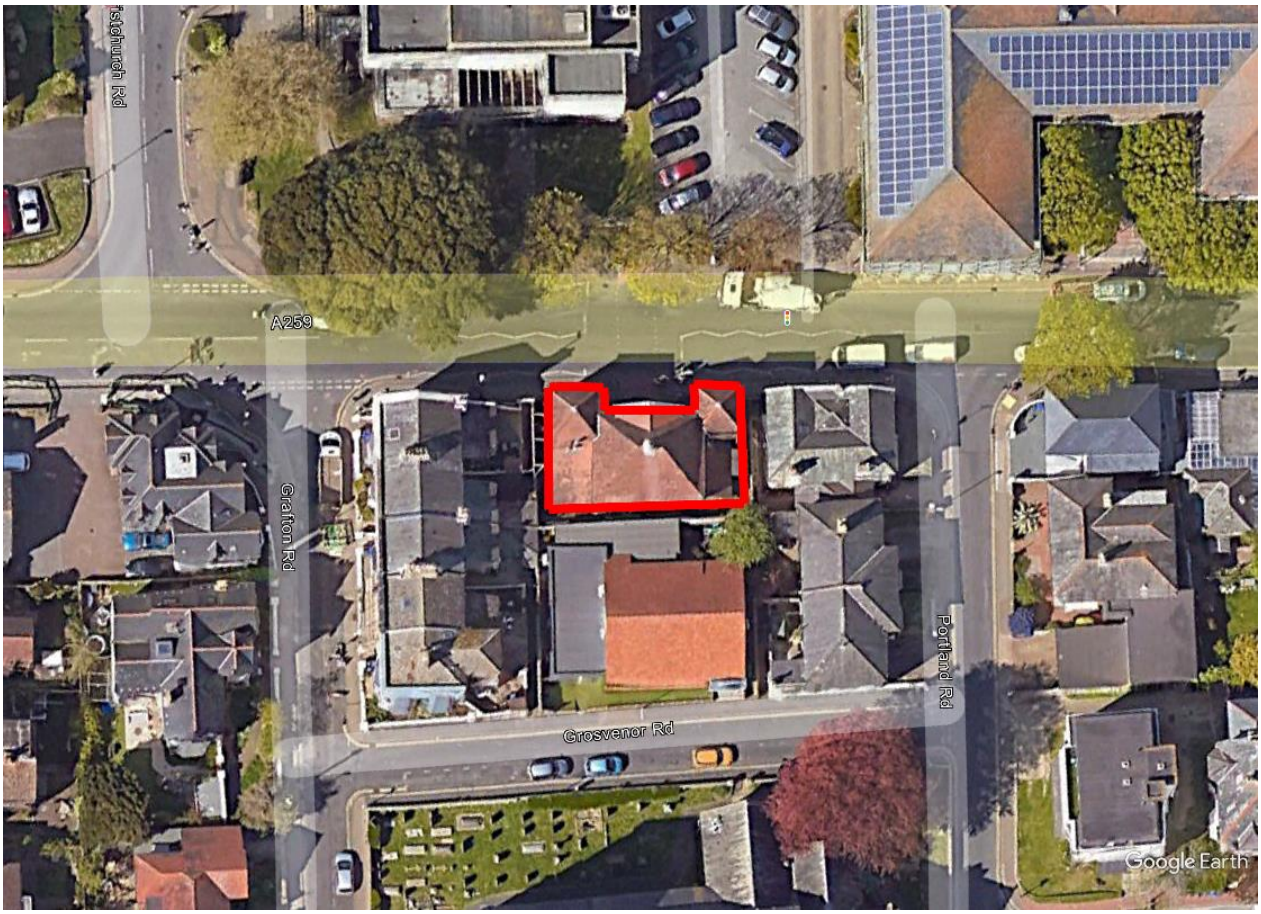
Code of Practice: BS8233: 2014 - Sound Insulation and noise reduction for buildings.

ProPG: Planning & Noise - Professional Practice Guidance on Planning & Noise - May 2017

ACOUSTICS VENTILATION AND OVERHEATING - Residential Design Guide – Jan 2020

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10 Google Earth:



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1-hour values – GF – L10 values

Time:	LAF,10.0%_3
(2023-10-18 10:30:00.780)	29.3
(2023-10-18 11:30:00.780)	29.7
(2023-10-18 12:30:00.780)	28.9

1second data available upon request