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Noise Impact Assessment undertaken by:

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Michael Vine was the founder and operator of Airtight & Noisecheck Ltd for over 20years, during which time he undertook numerous Noise Impact Assessments Nationwide. He now owns and operates Vine Acoustics Ltd.

NOISE IMPACT ASSESSMENT FOR

JB ARCHITECTURAL DESIGN STUDIO LTD
C/O 212-218 LONDON ROAD
WATERLOOVILLE
HAMPSHIRE
PO7 7AJ

SITE ADDRESS

PROPOSED 1 X 12 BED HMO, 8 X FLATS AND COMMERCIAL USE
212-218 LONDON ROAD
WAERLOOVILLE
HAMPSHIRE
PO7 7AJ

ASSESSMENT DATE: 20TH – 23RD NOVEMBER 2025
10TH – 12TH FEBRUARY 2026

REPORT DATE: 3RD MARCH 2026

Acoustic Engineer:



Testing Date: 20th – 23rd November 2025
10th – 12th February 2026

Michael Vine



VINE ACOUSTICS LIMITED – NOISE IMPACT ASSESSMENT

Contents

Customer Name.....	3
Site Address.....	3
Equipment Used.....	3
Measurement Procedure.....	3
Assessment Criteria.....	4-7
Executive Summary.....	8
Acoustic Design Statement.....	9
Objective.....	10
Calibration.....	10
Site Layout & Microphone Locations.....	10
Weather Conditions.....	10
Results Table & Conclusion.....	11-13
L _{Amax} Values.....	14
Required level of mitigation.....	15
Ventilation, Glazing, Façade & roof.....	15
Results Summary.....	16
Site Plans.....	17-20
Pro PG Tables.....	21-22
Appendix.....	23
Google Earth.....	24
Raw Data.....	25-43



VINE ACOUSTICS LIMITED – NOISE IMPACT ASSESSMENT

Customer Name:

Testing Date: 20th – 23rd November 2025

10th – 12th March 2026

Report Date: 3rd March 2026

JB Architectural Design Studio Ltd
C/O 212-218 London Road
Waterlooville
Hampshire
PO7 7AJ

Site Address:

212-218 London Road
Waterlooville
Hampshire
PO7 7AJ

Acoustic Engineer:

Mr. Michael Vine

Equipment used:

Norsonic Environmental Analyser 140 BS EN IEC 61672-1 2013 Class 1 – Associated frequency analyser to BS EN IEC 61260: 1996 Class 1 – serial 1407126 – calibration due March 2026

Measurement Microphone (Nor 1225) – Serial Number 305215 – calibration due March 2026

Acoustic Calibrator - (Type 1251) – Serial No 31652, Calibration due November 2026

Measurement Procedure:

The purpose of this noise impact assessment is to assist with the proposed planning application shown below & to provide suitable mitigation measures to ensure the future residents are protected from the local noise sources apparent:

Site Address: 212-218 London Road, Waterlooville, Hampshire, PO7 7AJ

Proposal: Subdivision and part-retention of the ground floor for commercial use (Class E), 8 x new residential flats (Class C3) at ground floor (3no) & 1st floor level (5no), new roof extension providing a second 12-bed HMO, over the 2nd & 3rd floor with third-storey roof addition.

An unattended assessment measuring the current acoustic climate over a 24-hour period in one microphone location was undertaken to determine the ambient noise levels at the proposed front façade for 24hours (Western façade) and for 48hours at the rear elevation (Eastern façade) of the proposed development site, to the front of proposed scheme facing London Road and to the rear facing the office building. The assessment took place between 1012hrs on Tuesday 20th to 1012hrs on Wednesday 21st November at the front and then the data has been extrapolated for the rear façade between 0700hrs on Tuesday 10th February to Thursday 12th February 2026.

The unattended assessment took measurements from the noise associated with London Road (very busy road network) at the front. The noise sources at the rear were deemed to be commercial uses serving the petrol filling station & Wicked department store but the dominant noise source w road traffic.

**This assessment is also in conjunction with the commercial noise assessment undertaken between 9th – 12th and 15th – 16th February 2025. Furthermore, to avoid any more delays for the customer, the $L_{Amax,F}$ data taken at the side elevation (facing the PFS & road network) will be used (along with other data) for the rear elevation and this will be higher than the levels at the rear (this is reinforced by the reduction in L_{Aeq} levels during the rear assessment period). See $L_{Amax,F}$ assessment later in the report as other source levels are also referenced and mitigated against.*



VINE ACOUSTICS LIMITED – NOISE IMPACT ASSESSMENT

Assessment Criteria:

The National Planning Policy Framework (NPPF) came into effect in March 2012 and was updated in December 2024. 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 187 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 198 states - 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 impact resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;
- 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; and
- c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes, and nature conservation.

Paragraph 200 - 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 as a result 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, dated 22nd July 2019, and has the noise hierarchy table as shown below. Paragraphs 009 & 011 are referenced 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.*



VINE ACOUSTICS LIMITED – NOISE IMPACT ASSESSMENT

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 in order to avoid significant adverse effects (“avoid”); or
4. Planning consent should be refused on noise grounds in order 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-practice 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. **Table 2.1 – Excerpt from WHO [dB ref. 20μPa]**

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

This guidance also states:

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



VINE ACOUSTICS LIMITED – NOISE IMPACT ASSESSMENT

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 LAeq on balconies, terraces and in outdoor living areas. To protect the majority of people from being moderately annoyed during the daytime, the outdoor sound level should not exceed 50dB LAeq. 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 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

The local authority listed the criteria below for the Noise Impact Assessment in a pre-application response to the scheme.

Overall it is considered that provided a Noise Assessment can demonstrate that noise and ventilation issues can be successfully mitigated for future occupiers, then with some careful minor revisions, it is considered likely that the proposed mixed use development would be able to satisfactorily demonstrate an adequate standard of living and amenity can be provided for future residents, whilst having no harm on neighbouring amenity, in accordance with Policies CS16 and DM10.

The above correspondence must be considered during this application.

Pro PG document states the following for L_{Amax,F} noise levels.

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 WHO guidance states the following regarding frequency of events: For a good sleep, internal maximum noise levels should not exceed 45dB L_{Amax} more than **10–15 times per night**. Therefore, the calculations used in this assessment are the numbers of events not exceeding 10 times between the hours of 2300-0700hrs – measured in F time-weighting – L_{Amax,F} for the front elevation. The rear elevation has been assessed in numerous ways, and the conclusions are always the same. However, to ensure no further delays – the data for the Northern elevation was referenced once again and other corrections applied. Furthermore, there are some single events that occur at the rear during the morning period, it is clear these are not regular events as there are periods whereby they do not occur, but to further protect against this it is recommended that a glazing level of 35dBA be applied to the bedrooms located on the rear elevation, with all other windows offering 30dBA. It can be seen that 80dBA was only exceeded 2 times during the night time period using the 3min data for the Northern façade, at the Northern façade so this level of reduction will be applied to the rear façade. A -3dB correction has been applied for reflection.

A glazing offering 35dBA will protect against noise levels of 83dBA at the residential faced (corrected to 80dB to account for reflection) this level of protection for bedrooms would seem excessive but apparent considering the situation. It can be seen that the noise levels do not regularly exceed 80dB at the rear elevation during the night time period and there are many hours whereby the noise levels are much less.



VINE ACOUSTICS LIMITED – NOISE IMPACT ASSESSMENT

Executive Summary:

Vine Acoustics Ltd were instructed by JB Architectural Design Studio Ltd on behalf of the building owner to undertake a Noise Impact Assessment (NIA) at 212-218 London Road, Waterloooville. A planning application is to be made to convert the existing building into a 12-x bedroom HMO (2nd & 3rd floors), with a commercial unit remaining at ground floor level and the addition of 3 x residential flats at ground floor level & a further 5 x flats at 1st floor level. The site will be extended by 2 x additional storeys to accommodate the scheme. The microphone locations were used to determine the impact of the following noise sources on the proposed dwellings:

1. Noise associated with London Road – Front façade (Western)
2. Noise associated with Petrol Filling Station (Northern)

This report will address the noise sources listed above and has been written to assess the impact of the noise sources on the proposed mixed-use scheme, in particular the bedrooms that will be located on both the Western & Northern facades at Ground, 1st, 2nd & 3rd floor. Calculations will be provided for the bedrooms and dwellings on the rear façade. The proposed bedrooms & dwellings should not be adversely affected by the noise associated with the immediate area providing the necessary mitigation measures are implemented to the scheme. The measured noise levels are consistent with the site near the noise sources listed above. The conclusions of this report illustrate that the noise associated with the immediate area will not have an adverse impact on the proposed residential scheme, providing that suitable mitigation measures are implemented to the proposed scheme. It is recommended that the scheme be fitted with an alternative ventilation system such as MVHR with summer cooling, acoustic wall ventilation, or acoustic trickle vents to assist with periods when windows are closed. However, to strike a balance between noise, overheating & ventilation it is anticipated that future residents of the scheme should be able to ventilate the bedrooms naturally by opening windows on various elevations throughout the day time and night time period. Both the measured & calculated levels indicate a generally low to moderate impact on large parts of the proposed scheme with lengthy periods whereby the rooms can be naturally ventilated via open windows without leading to an adverse impact. The rooms located to the rear are exposed to lower noise levels than the front, but a high level of mitigation is proposed throughout, but in reality the rear rooms could be naturally ventilated for longer without it leading to an adverse impact.

Therefore, the scheme can be naturally ventilated with open windows for periods of the day time and night time. The measures to be taken by the client should ensure a satisfactory acoustic climate for the future residents of the proposed scheme.

The immediate area is in a mixed-use location with dwellings located to the front of the scheme, on the other side of London Road, some commercial buildings to the South, the petrol filling station to the North and an office building to the East (rear).

There are existing residential dwellings located in similar locations to the proposed, along London Road.



VINE ACOUSTICS LIMITED – NOISE IMPACT ASSESSMENT

Acoustic Design Statement:

The measured average levels are moderate and constant throughout the measurement duration. The necessary noise criteria should be achieved by suitable mitigation measures for the building façade & glazing. The client will take steps and implement mitigation measures to ensure the impact of the external & internal noise should not have an adverse impact on the future residential dwelling. These steps include:

- 1 Install a robust glazing system to the scheme to protect the residents from external noise emissions when closed
- 2 Thermal mass offered by the building fabric
- 3 Alternative ventilation system installed to dwellings to ensure ventilation when windows closed
- 4 Orientation of noise sensitive rooms – some bedrooms & flats located to the rear
- 5 No windows on Northern elevation

The initial risk assessment has indicated that the day time noise levels for the proposed scheme fall into the medium-to-high category for the front and negligible to low categories at the rear. Pro PG states that for medium categories *‘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.’

A robust & comprehensive ADS has been applied to the scheme. This is the case as can be seen above. The ADS for this scheme included robust & comprehensive mitigation measures that will ensure a suitable acoustic criterion for the future residents of the scheme.

The alternative ventilation system are not designed to ensure BS8233: 2014 compliance in isolation but offer suitable levels of ventilation during periods when windows maybe closed, but it is anticipated that the scheme can be naturally ventilated with open windows for periods of the day time and night time periods, and it is essential that a balance is struck between noise, ventilation and overheating as there will clearly be periods of the day time and night time that the dwellings will not be adversely affected by the noise sources.



VINE ACOUSTICS LIMITED – NOISE IMPACT ASSESSMENT

1 Objective:

1.1 To demonstrate that the noise associated with the immediate area will not have an adverse impact on the proposed residential scheme. A planning application is to be made to convert the existing building into a 12-x bed HMO with the bedrooms located at 2nd & 3rd floor (11x bedrooms at 2nd floor & 1 x bedroom at 3rd floor level), and the commercial/retail units remaining at the ground floor, along with 3 x flats, and a further 5 x flats at 1st floor level.

1.2 This report will account for noise emissions produced from London Road at the front & the levels to the rear. The scheme will include comprehensive mitigation measures to reduce the impact of the sources and ensure a suitable internal acoustic environment and a balance between noise, ventilation & overheating.

2 Calibration:

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

3 Site Layout & Microphone Position:

3.1 London Road is the main transport street and bus route through the Centre of Waterlooville, Hampshire. The road is a main road through the immediate area and is busy for long periods of the day time and night time. The petrol filling station is located to the North of the scheme and is open between 0600-2200hrs 7 days a week, along with a Wickes DIY store beyond. These sources have been assessed via a commercial assessment as requested. The proposed building is a large, detached building located immediately to the East of London Road, with the front elevation directly facing the road at a distance of approximately 5m. The rear elevation (East) will face the rear office building, with the rear elevations being screened from the road.

3.2 The immediate area is predominantly mixed use with residential dwellings located along London Road to the North, South & West of the scheme. The petrol filling station is located to the North, with other commercial buildings located to the East & South of the proposed scheme.

3.3 The proposed scheme will comprise of a mixed-use scheme with a commercial unit located at the front on the ground floor, the bin stores at the rear and 3 x residential dwellings also at ground floor. There will be 5 x flats at 1st floor level with flats 5 & 6 the only ones facing the front (road) along with the bedroom of flat 4, all other flats will face the rear of the scheme and therefore be exposed to lower noise levels. There will be a 12-x bedroom HMO located at 2nd & 3rd floor level, along with a communal kitchen/living space at 3rd floor. 11 x bedrooms will be at 2nd floor level, with bedrooms 1-6 facing the front but 7-11 all facing the rear, with 1 x bedroom & the communal kitchen/living space being located at 3rd floor level – these will be set back and thus screened from the noise source.

3.4 The measurement microphones were located:

- 1- At the building façade facing London Road. It was 1m from the building façade so a -3dB reduction has been applied to the figures to account for reflection.
- 2- At the building façade facing the rear of the site (Eastern Elevation). It was 1m from the building façade so a -3dB reduction has been applied to the figures to account for reflection.

4 Weather Conditions:

4.1 The weather was cold & predominantly dry during the measurement procedure (some rain during periods whereby data was not used); the temperature ranged between -1-5 degrees on Thursday 20th, -3-7 degrees on Friday 21st, -3-9 degrees on Saturday 22nd & 2-11 degrees on Sunday 23rd November. There was light cloud during the measurement period. There were some light rain showers during the February assessment but generally the weather was acceptable. There was little to no wind during all of the assessments.

5 Measurement Duration:

5.1 The continuous measurement was taken for a 24-hour period at the front façade and 48hours at the rear façade. The immediate area was operating at normal levels and thus offers a fair reflection of the noise associated with the immediate area during the assessment periods.



VINE ACOUSTICS LIMITED – NOISE IMPACT ASSESSMENT

6 Results:

6.1 The purpose of this measurement was to establish the levels associated with the immediate area on the proposed scheme. The levels will be compared to the necessary British Standards & relevant documents, also some bespoke measurements will be adopted.

LAeq 16hour & 8hour Noise Levels:

Mic Location	L _{Aeq} 16hour Value	Reduction needed for BS8233 compliance	L _{Aeq} 8hour Value	Reduction for BS8233 compliance	L _{Amax} Value	Reduction for compliance
ML 1 – Front elevation	72dBA	37dB	63dBA	33dB	81dBA	36dB
ML 2 – Rear elevation – Tues	54dBA	19dB	48dBA	18dB	*75dBA	30dB
Rear Elevation - Weds	55dBA	20dB	53dBA	23dBA		

**Date from the Northern elevation used – other values also referenced for L_{Amax} noise – see later in the report*

7 Results Conclusion:

7.1 The tables listed above clearly indicate the required sound reduction values at the proposed site. It is clear to see that the measured levels are within the medium to high category of the Pro PG document for the front façade and the negligible to low category for the rear façade. Providing suitable mitigation measures are applied to the necessary facades and the required internal criteria can be achieved. It is anticipated that the scheme can be naturally ventilated with open windows for periods during the day time and night time, to achieve a balance between noise, ventilation, and overheating and without leading to a change in behavior – especially those located to the rear.

7.2 Based on the measured noise levels, the proposed mitigation measures, the location of the development and the type of noise apparent it is anticipated that the noise will fall at The NOEL value (No adverse effect level) and maybe towards the LOAEL (Lowest observed adverse effect level) and as such the noise should not have a detrimental effect on the future residents providing adequate measures are implemented to the building fabric & elements. For noise sources at the LOAEL, it is anticipated that the noise will be noticeable but not intrusive if suitable mitigation measures are implemented to the development.

7.3 Based on the measured levels and assuming a glazing specification offering a sound reduction of 30dBA (meeting the levels required above) is installed the following internal levels would be achieved:

Front Facade

Room	External Level	Sound Reduction of windows	Internal Level	Criteria Met
Lounge	72dBA	37dB	35dBA	Yes
Bedroom – L_{Aeq}	63dBA	37dB	26dBA	Yes
Bedroom – L_{Amax}	81dBA	37dB	44dBA	Yes

Rear Facade

Room	External Level	Sound Reduction of windows	Internal Level	Criteria Met
Lounge	54-55dBA	35dB	19-20dBA	Yes
Bedroom – L_{Aeq}	48-53dBA	35dB	13-18dBA	Yes
Bedroom – L_{Amax}	*75dBA	35dB	40dBA	Yes

7.4 The levels above indicate that the internal levels can be achieved with the windows closed. Further table shown on the following page. Section 2.30 and Figure 2 of the Pro PG document states that the internal guidelines of BS8233: 2014 can be relaxed by 5dBA (40dBA L_{Aeq} 16hour and 35dBA L_{Aeq} 8hour) when the dwellings are necessary or desirable and that residents will accept a slight increase in noise levels to ensure natural ventilation. A relaxation of 5dBA will still ensure a reasonable standard of living. This approach could be implemented to development for the day time levels and the night time levels.



VINE ACOUSTICS LIMITED – NOISE IMPACT ASSESSMENT

7.5 The levels shown in the table above indicate that a reasonable standard of living can be achieved with closed windows, and the calculations below indicate the levels with open windows for transportation noise.

7.6 Table 3.3 – Guidance for level 2 assessment of noise from transport services in the ANC AVO guide states that ‘Noise causes a material change in behaviour e.g., having to keep windows closed most of the time’ if the following levels are exceeded for longer periods of time:

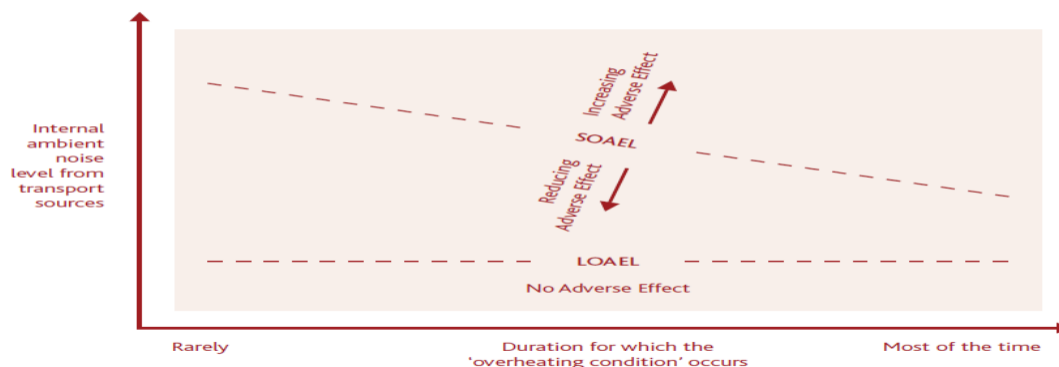
<i>Internal ambient noise levels</i>		
<i>L_{Aeq} 16hour 0700-2300</i>	<i>L_{Aeq} 8hour 2300-0700</i>	<i>Individual noise events 2300-0700</i>
<i>>50dB</i>	<i>>42dB</i>	<i>Normally exceeds 65dB L_{AmaxT}</i>

7.7 Using the above guidance (sliding scale as shown in the diagram below) the calculated internal levels at all facades and other screened facades (rear facades) with the windows open are also shown below. It is anticipated that the future occupants will accept an increase in the noise levels for periods of time to ensure good thermal comfort for the dwellings. These levels can be met for transportation noise. There will be periods of time when windows are opened and may be fewer, but then the acoustic trickle vents can ensure suitable levels of ventilation for the bedrooms. The future residents will be able to open and close the windows at their own discretion at the rear elevations can be open as they wish.

<i>Front Façade</i>	<i>External Level</i>	<i>Sound Reduction of open windows</i>	<i>Internal Level</i>
<i>Lounge</i>	72dBA	-13dB	59dBA
<i>Bedroom – L_{Aeq}</i>	63dBA	-13dB	50dBA
<i>Bedroom - L_{Amax}</i>	81dBA	-13dB	68BA

<i>Rear Façade</i>	<i>External Level</i>	<i>Sound Reduction of open windows</i>	<i>Internal Level</i>
<i>Lounge</i>	54-55dBA	-13dB	41-42dBA
<i>Bedroom – L_{Aeq}</i>	48-53dBA	-13dB	35-40dBA
<i>Bedroom - L_{Amax}</i>	*75dBA	-13dB	62dBA

Figure 3-2 Qualitative guidance on combined effect of internal ambient noise level and duration for the overheating situation



7.8 Based on the measured average levels and anticipated internal levels, it is recommended that whilst the scheme can be naturally ventilated for short periods of time, to ensure suitable internal balance and criteria that an alternative ventilation system is incorporated into the scheme. An alternative ventilation system will help to ensure that the dwellings can be ventilated when the windows are closed. These measures combined with glazing should ensure a reasonable standard of living can be achieved for the proposed dwellings.



VINE ACOUSTICS LIMITED – NOISE IMPACT ASSESSMENT

7.9 It can be seen that the measured levels at the site for the front & rear elevation are above those levels listed within the values listed in Table 3.3 with windows open and therefore consistently higher noise levels may lead to a change in behavior, although the rear facades should be exposed to lower noise levels and these rooms will meet the levels stated in table 3.3 and thus these residents can have their windows open for longer periods of time. The purpose of the alternative ventilation system is to ensure the bedrooms can be ventilated for the period of time when the windows are closed, and a balance must be struck between noise, overheating, and ventilation. It is anticipated that future residents will accept this slightly higher level for periods of time to be able to naturally ventilate their homes and the measured levels should not be intrusive.

7.10 The proposed measures indicate that the development follows the approach recommended in the PPG Guidance (Paragraph 009) regarding the closure of windows which states: *“The agent of change will also need to define clearly the mitigation being proposed to address any potential significant adverse effects that are identified. Adopting this approach may not prevent all complaints from the new residents/users about noise or other effects but can help to achieve a satisfactory living or working environment and help to mitigate the risk of a statutory nuisance being found if the new development is used as designed (for example, keeping windows closed and using alternative ventilation systems when the noise or other effects are occurring).”*

7.11 Paragraph 011 of the same guidance states: Noise impacts may be partially offset if residents have access to one or more of:

- a relatively quiet facade (containing windows to habitable rooms) as part of their dwelling.
- a relatively quiet external amenity space for their sole use, (e.g., a garden or balcony). Although the existence of a garden or balcony is generally desirable, the intended benefits will be reduced if this area is exposed to noise levels that result in significant adverse effects.
- 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, externally publicly accessible amenity space (e.g., a public park or a local green space designated because of its tranquility) that is nearby (e.g., within a 5-minute walking distance).

7.12 The proposed scheme ensures that some of the bullet points shown above have been implemented as part of the application. There are quieter facades as part of the application that are screened from the noise sources (rear facade). In addition to the orientation of the rooms, further measures also include installing alternative ventilation measures to the dwellings & bedrooms to ensure suitable levels of ventilation when the windows are closed, but all residents will have the ability to open their windows at their own discretion.

Residential Amenity Space:

7.13 Due to the location of the amenity spaces (none of them will directly face the road network, with the space at 1st floor level being located to the rear of the scheme, and the terrace at 3rd floor level will be screened from the noise sources due to its location) it is anticipated that the noise levels on the amenity space will not lead to an adverse impact for the future residents. The measured LAeq 16hour value at the rear of the development was 54-55dBA this is already equal to and below the recommended upper limit as set out in BS8233: 2014. It is anticipated that once the development is built and all façade treatments are implemented then the further reductions this will offer will ensure these spaces are below the lower limit as set out in BS8233: 2014 are achieved. For the ground floor amenity spaces located to the South of the building, the client will accept a proposal for a 2m high acoustic barrier (such as Jackson’s reflective barrier) that has lab calculations suggesting an improvement of 28dB for the ground floor amenity spaces located to the South of the building. Whilst it is accepted that this level of performance is subjective to numerous factors and site specific it is anticipated that such a barrier will offer a prominent level of sound reduction and therefore achieve a reasonable standard of noise within the ground floor amenity spaces.



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L_{Amax} Values:

7.14 The L_{Amax} values for the site have been measured during various visits and in a number of ways. As part of the commercial assessment at the rear elevation (as requested by the environmental department) the time intervals were set to 15min (as per BS4142: 2014 + A1: 2019). The values were not used as part of the L_{Amax} assessment as they are too long to determine the impact. However, the values at the front of the site have been assessed using 3min segments, which is within the recommended 1-3minute segment listed in numerous correspondence for assessing L_{Amax} values.

This time period was considered appropriate (and has been on numerous other sites) based on various articles, one being [Assessing Lmax for residential developments: the AVO Guide approach](#), by Apex Acoustics. That paper suggested that a time interval between one and three minutes would be suitable, based on the sleep study research into the effects of noise events. There is no set time period for assessing L_{Amax} events and as previously explained a 3min segment appears to offer a fair reflection of the acoustic criteria.

Further to the above and noting that the level at the front façade is 81dBA – the data has been analysed, and it is accepted that there are some incidences whereby the L_{Amax} values are increased, in particular between 0530-0700hrs. With this in mind, it is recommended that the client install glazing to the bedrooms located on the rear elevation to 35dBA, which will ensure noise events up to 83dBA on this elevation (corrected to 80dBA for reflection) and it can be seen that such a level of reduction will protect against the majority of noise events at the rear elevation. There are a couple of events that exceeded this level of reduction but having looked at the data for all of the assessments undertaken, this level is not regularly exceeded and as such a sound reduction of 35dB at the rear would ensure a reasonable level of mitigation against the noise sources apparent.

L_{Amax} should not be based on one-off levels but rather a level that is not exceeded more than 10 times per night. It is the opinion of the author that a level of 30dB would achieve this but in the interest of robustness this level has been increased to 35dB sound reduction offered by the glazing for bedrooms located on the rear elevation and 30dBA for all other rooms. These windows in conjunction with acoustic trickle vents serving the bedrooms should ensure a suitable acoustic criterion for future residents. It must be reiterated that such events are not commonplace, and this can be seen the majority of the data recorded on numerous visits to site, and the generally low average noise levels apparent. So, it is anticipated that the residents will be able to naturally ventilate their dwellings via open windows during periods of the day time and night time without leading to a change in behaviour.



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8 Required Levels of Mitigation:

<i>Elevation</i>	Noise Source	Level of Sound Reduction
<i>Front Façade</i>	London Road	37dBA
<i>Rear Façade</i>	Various	35dBA for bedrooms 30dBA for other rooms

9 Building Specifications:

9.1 It is recommended that the dwellings are ventilated with an alternative ventilation system. These will ensure the dwellings can be ventilated when the windows are closed.

Make	Model	Type
Vent-Axia	Sentinel Kinetic Plus	Whole House Ventilation
Titon	HRV1.25 Q Plus with Trimbox NO2 Filter®	Whole House Ventilation
Nuaire	MRXBOXAB-ECO2B Wall Mounted MVHR	Whole House Ventilation

A ventilation system could be an acoustic wall ventilation system, such as:

Make	Model	Type
Titon Direct	Sonair F+	Wall mounted acoustic Ventilation

9.3 The above system is a wall mounted ventilation unit that allows for ventilation when the windows are closed, with elevated levels of sound reduction.

9.4 Another option could be to install acoustic trickle vents to the noise sensitive rooms, something similar to:

Product	Sound Reduction - open	Sound reduction - closed
RW Simon Acoustic EHA trickle vent	36dB	38dB – Front & side
RW Simon EHAS trickle vent	38dB	41dB – Front & side

If multiple vents are required, then the performance requirement shown in Table 6.3 will increase by a value equal to $+10\log(N)$, with N being the total number of vents serving the room.

9.4 Façade Detail – The proposed façade is believed to be something like: - Aggregate block cavity wall, minimum 100mm blocks (minimum density 1350kg/m³), minimum 75mm cavity between leaves, finished with 13mm plaster. This system should achieve a sound reduction of between 50-52dB DnT,w + Ctr 'Code of Practice BS8233: 2014, Page 60 – Table E.1B – Airborne sound insulation of walls and partitions'. Also, a cavity wall system comprising of 7N concrete blocks (two separate frames), have a sound reduction of approximately 53dB (predicted weighted sound reduction index values of Celcon Blockwork – from H&H Celcon). The mansard roof detail will also offer a suitable level of sound reduction for the scheme.

9.5 Roof Detail – The proposed roof detail is believed to be like: Flat roof system with 100mm mineral wool on plasterboard ceiling. This system should achieve a sound reduction of 43dB R_w 'BS8233: 2014, page 41 - Table 8 - The sound insulation of roofs'.

9.6 Windows - The proposed windows to be used is unknown but a robust system offering a sound reduction of more than 37dBA has been determined from the various calculations (front elevation) and thus the specifications listed below will offer this level of reduction.

Possible Units	Thickness	125Hz	250Hz	500Hz	1KHz	2KHz	4KHz	Overall reduction
SG Solaglass 10-12-8.4	30.4mm	28	30	39	44	49	56	42-5 = 37dB
SG Solaglass 10-12-10.4	32.4mm	28	30	39	43	48	58	42-5 = 37dB
SG Solaglass 8.8-12-10	30.8mm	30	28	37	39	40	51	38-3=35dB
SG Solaglass 4-10-6	20mm	24	23	28	38	40	42	34-4 = 30dB

9.7 There are many other suitable products, and the client will have to show compliance with the windows before installation, the manufacturer will have the acoustic data for the windows.



VINE ACOUSTICS LIMITED – NOISE IMPACT ASSESSMENT

10 Results Summary:

10.1 The findings of these surveys indicate that whilst the noise levels are between the medium to high category in the Pro PG document and are dominant at the front façade, they should not have an adverse impact on the proposed residential bedrooms, providing the necessary mitigation measures are applied to the site.

10.2 The results of the various detailed calculations & various assessments undertaken indicate that the noise emissions associated with area and neighbouring commercial uses and surrounding area will not lead to an adverse impact for future residents. The road traffic noise is the dominant noise source and thus the bedrooms located on the front façade are exposed to higher noise levels, but there are screened facades and robust and comprehensive mitigation measures to be implemented by the client to ensure a suitable acoustic criterion for the scheme.

10.3 The mitigation measures listed within this report offer suitable sound reduction for the necessary building elements and if they are implemented throughout the site then the future residents should be able to enjoy a reasonable standard of living. Upon implementation of the mitigation measures, the internal & external criteria of BS8233: 2014 should be met within the noise sensitive bedrooms at the proposed development.

10.4 Planning ProPG states that a good acoustic design process is a vital part of new developments. The client has taken steps to ensure that the existing & future occupants are protected from the noise source, these steps include:

- 1 Install a robust glazing system to the scheme to protect the residents from external noise emissions when closed
- 2 Thermal mass offered by the building fabric
- 3 Alternative ventilation system installed to dwellings to ensure ventilation when windows closed
- 4 Orientation of noise sensitive rooms – some bedrooms & flats located to the rear
- 5 No windows located on Northern elevation

10.5 The measures taken by the client should ensure the future residents will not be adversely affected by the noise sources associated with the immediate area.

10.6 Whilst this report recommends an alternative ventilation system to be installed, this is not meant to ensure the bedrooms are solely reliant on such. There are facades on the proposed dwellings and bedrooms that will be able to be naturally ventilated for longer periods of the day time and night time via open windows due to screening from the noise sources. It is essential to strike a balance between noise, overheating & ventilation and this report offers such measures.

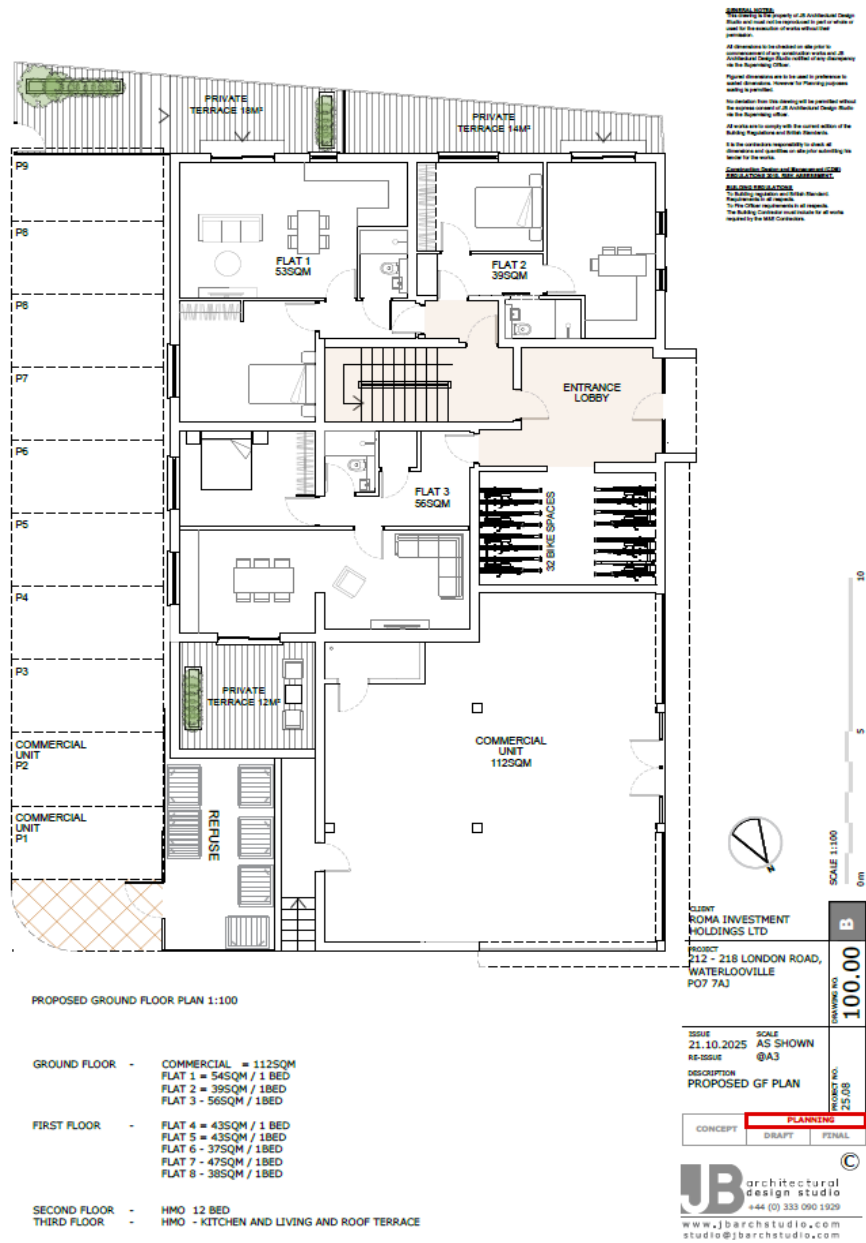
10.7 It can also be seen that good acoustic design has been incorporated into the development by having no windows on the Northern or Southern elevations at upper floors, therefore the majority of rooms located away from the road will be served by windows facing the rear elevation. It can also be seen that the noise decays substantially at the rear for large parts for the day time and night time, so this further reduction can be expected when assessing the rear facades as shown in the calculation tables. All rooms located to the rear will be exposed to lower noise levels due to screening of the buildings. The site plan clearly shows that a good acoustic design has been implemented with a large number of bedrooms & dwellings located to the rear of the development and therefore exposed to lower noise levels due to the extra distance from the source and also the screening offered by the building fabric.

10.8 It is anticipated that windows with an overall sound reduction of 30dBA should be sufficient for the rear elevations, with the exception of the bedrooms whereby an overall minimum level of sound reduction of 35dB has been listed to ensure suitable compliance for a variety of noise events and sources.



VINE ACOUSTICS LIMITED – NOISE IMPACT ASSESSMENT

SITE PLAN





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PROPOSED FIRST FLOOR PLAN 1:100

GROUND FLOOR	-	COMMERCIAL = 112SQM FLAT 1 = 54SQM / 1 BED FLAT 2 = 39SQM / 1BED FLAT 3 = 56SQM / 1BED
FIRST FLOOR	-	FLAT 4 = 43SQM / 1 BED FLAT 5 = 43SQM / 1BED FLAT 6 = 37SQM / 1BED FLAT 7 = 47SQM / 1BED FLAT 8 = 38SQM / 1BED
SECOND FLOOR	-	HMO 12 BED
THIRD FLOOR	-	HMO KITCHEN AND LIVING AND ROOF TERRACE

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Construction Details and Materials
To be agreed with the Building Regulations.
To be agreed with the Building Regulations.
The Building Contractor must provide for all works required by the Building Regulations.



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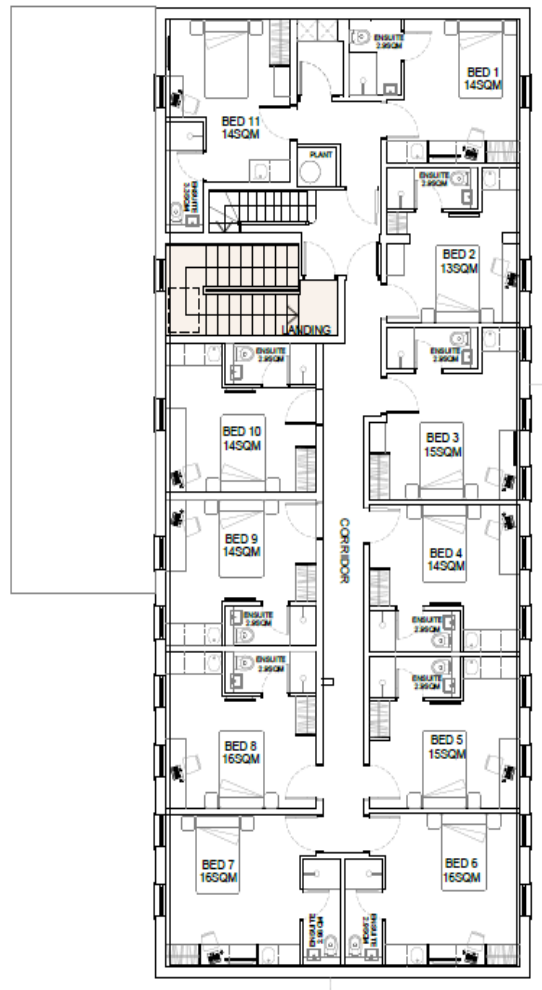
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PROPOSED SECOND FLOOR FLOOR PLAN 1:100

GROUND FLOOR - COMMERCIAL = 112SQM
 FLAT 1 = 54SQM / 1 BED
 FLAT 2 = 39SQM / 1BED
 FLAT 3 = 56SQM / 1BED

FIRST FLOOR - FLAT 4 = 43SQM / 1 BED
 FLAT 5 = 43SQM / 1BED
 FLAT 6 = 37SQM / 1BED
 FLAT 7 = 47SQM / 1BED
 FLAT 8 = 38SQM / 1BED

SECOND FLOOR - HMO 12 BED
 THIRD FLOOR - HMO KITCHEN AND LIVING AND ROOF TERRACE

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Construction Details and Materials (CDM)
 See Appendix A for details.

Planning and Building Regulations
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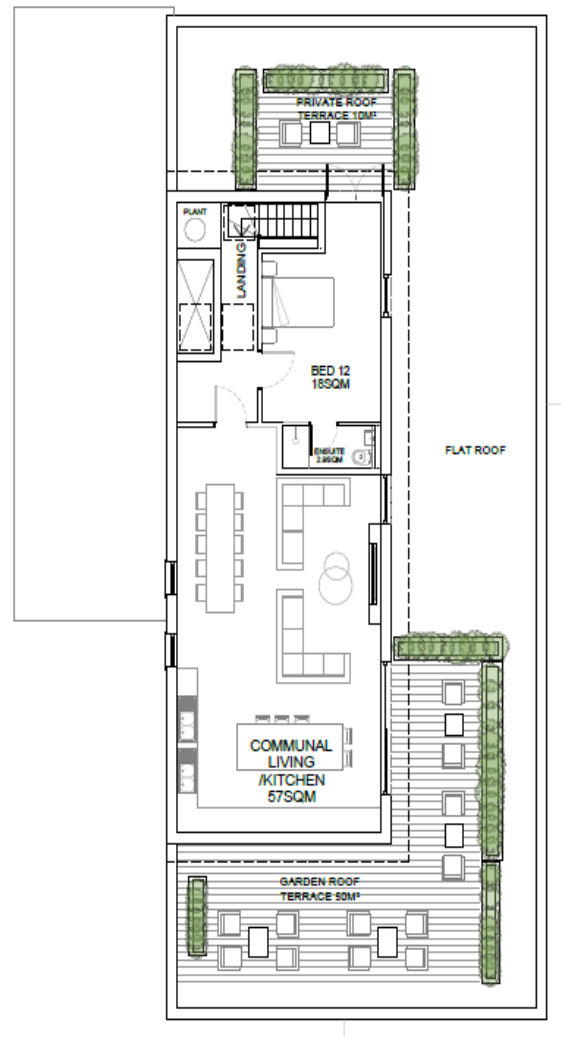
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 PROPOSED SECOND
 FLOOR PLAN

CONCEPT **PLANNING** DRAFT FINAL

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PROPOSED THIRD / ROOF PLAN 1:100

GROUND FLOOR	-	COMMERCIAL = 112SQM FLAT 1 = 54SQM / 1 BED FLAT 2 = 39SQM / 1BED FLAT 3 = 56SQM / 1BED
FIRST FLOOR	-	FLAT 4 = 43SQM / 1 BED FLAT 5 = 43SQM / 1BED FLAT 6 = 37SQM / 1BED FLAT 7 = 47SQM / 1BED FLAT 8 = 38SQM / 1BED
SECOND FLOOR	-	HMO 12 BED
THIRD FLOOR	-	HMO KITCHEN AND LIVING AND ROOF TERRACE

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 Physical dimensions are to be used in preference to stated dimensions. However for Planning purposes stating is permitted.
 No deviation from this drawing will be permitted without the express consent of JB Architectural Design Studio or the Surveying Officer.
 All works are to comply with the current edition of the Building Regulations and British Standards.
 It is the contractor's responsibility to check all dimensions and quantities on site prior to submitting the tender for the works.
Contractor Design and Build Agreement
JB ARCHITECTURAL DESIGN STUDIO
 To Building Regulations and British Standards Requirements in all respects.
 To the Client's requirements in all respects.
 The Building Contractor must include for all works required by the MBE Contractors.

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VINE ACOUSTICS LIMITED – NOISE IMPACT ASSESSMENT

Table B-5 Examples of passive ventilation solutions providing enhanced sound insulation

Design option	Description and references	Approximate Level Difference (external free field level – internal reverberant level)	Improvement relative to a window providing a similar amount of ventilation
Standard opening windows	Window(s) open sufficiently to provide a ventilation free-area equivalent to 2% of the floor area. ^[42]	13 dB	0 dB
Open windows with sound attenuating balconies	Window(s) as above. Balconies may have a solid balustrade or be enclosed to a further degree (maintaining an open area for ventilation). Absorption may be provided to the balcony soffit or potentially to other surfaces. ^[49, 50, 51]	17 – 23 dB	4 – 10 dB
Attenuated or plenum windows	Dual windows (spaced by around 200mm) with staggered openings and absorptive linings to the cavity reveals. Various other configurations also possible in principle. ^[52, 53]	17 – 24 dB	4 – 11 dB
Attenuated vents/louvres	Ventilation openings with integral means of attenuating sound. Typically this may be acoustic louvres or acoustically lined ducts/plena. ^[54, 55]	17 – 29 dB	4 – 16 dB
Attenuated windows or vents/louvres with sound attenuating balconies	Combined use of balconies to provide screening and acoustically attenuated windows or vents. Refer to above for description of each element.	21 – 39 dB	8 – 26 dB



VINE ACOUSTICS LIMITED – NOISE IMPACT ASSESSMENT

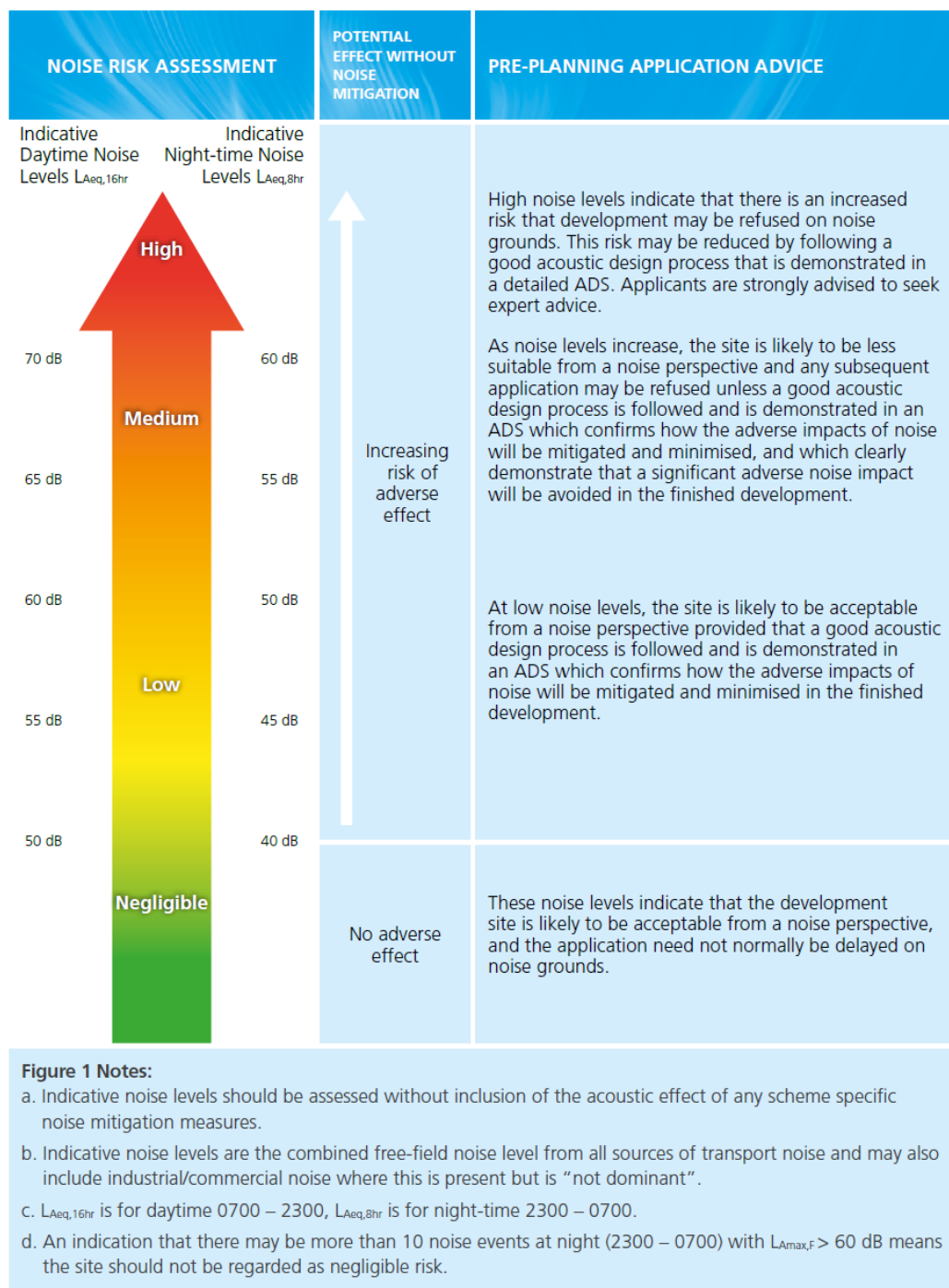


Figure 1. Stage 1– Initial Site Noise Risk Assessment



VINE ACOUSTICS LIMITED – NOISE IMPACT ASSESSMENT

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.

LAm_{ax} - 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

D_{ne,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

R_w 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.

World Health Organization (WHO) - Guidelines for Community Noise.

Pro PG — Planning & Noise, Residential Development — 2017



VINE ACOUSTICS LIMITED – NOISE IMPACT ASSESSMENT





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ML 1

Time Period	LAeq	LAmx
(2025/11/20 10:12:02.00)	74	81
(2025/11/20 10:15:02.00)	74.6	81
(2025/11/20 10:18:02.00)	73.9	80.3
(2025/11/20 10:21:02.00)	73.8	81.2
(2025/11/20 10:24:02.00)	73.7	81.5
(2025/11/20 10:27:02.00)	75.1	86.3
(2025/11/20 10:30:02.00)	72.9	81.4
(2025/11/20 10:33:02.00)	73.9	80.8
(2025/11/20 10:36:02.00)	73.3	80.3
(2025/11/20 10:39:02.00)	73.8	82.5
(2025/11/20 10:42:02.00)	74.1	81.1
(2025/11/20 10:45:02.00)	73.6	81.1
(2025/11/20 10:48:02.00)	75.4	83.5
(2025/11/20 10:51:02.00)	73.9	80.8
(2025/11/20 10:54:02.00)	74.6	79.5
(2025/11/20 10:57:02.00)	74.6	84.5
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(2025/11/20 11:06:02.00)	73.5	80
(2025/11/20 11:09:02.00)	73.9	80.3
(2025/11/20 11:12:02.00)	75.4	81.3
(2025/11/20 11:15:02.00)	74.7	82.4
(2025/11/20 11:18:02.00)	73.4	80.9
(2025/11/20 11:21:02.00)	75.2	87.1
(2025/11/20 11:24:02.00)	73.6	79.7
(2025/11/20 11:27:02.00)	73.9	80.6
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(2025/11/20 11:54:02.00)	73.2	82.2
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(2025/11/20 12:00:02.00)	74	79.4
(2025/11/20 12:03:02.00)	74.4	81.9
(2025/11/20 12:06:02.00)	74.7	80.5
(2025/11/20 12:09:02.00)	75.1	81



(2025/11/20 12:12:02.00)	74.8	90.7
(2025/11/20 12:15:02.00)	74.2	81.3
(2025/11/20 12:18:02.00)	74.6	82.2
(2025/11/20 12:21:02.00)	74.8	85.6
(2025/11/20 12:24:02.00)	77.6	94.6
(2025/11/20 12:27:02.00)	75	82.1
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(2025/11/20 13:18:02.00)	75	85.5
(2025/11/20 13:21:02.00)	74.8	81.4
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(2025/11/20 13:36:02.00)	75.8	90.7
(2025/11/20 13:39:02.00)	74.8	84.2
(2025/11/20 13:42:02.00)	74.5	81.7
(2025/11/20 13:45:02.00)	74.5	81.4
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(2025/11/20 14:21:02.00)	75.1	88



(2025/11/20 14:24:02.00)	75	81.6
(2025/11/20 14:27:02.00)	75.2	80.5
(2025/11/20 14:30:02.00)	75.3	87
(2025/11/20 14:33:02.00)	74.6	83.7
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(2025/11/20 14:57:02.00)	73.7	81.1
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(2025/11/20 15:21:02.00)	76.7	85.7
(2025/11/20 15:24:02.00)	74.4	80.8
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(2025/11/20 15:36:02.00)	74.8	81.4
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(2025/11/20 15:42:02.00)	75.7	82.2
(2025/11/20 15:45:02.00)	75	80.3
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(2025/11/20 16:03:02.00)	75.9	85.5
(2025/11/20 16:06:02.00)	75.8	82.2
(2025/11/20 16:09:02.00)	75.4	82
(2025/11/20 16:12:02.00)	75	85.4
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(2025/11/20 16:21:02.00)	75.1	83.6
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(2025/11/20 16:27:03.00)	74.8	81.2
(2025/11/20 16:30:02.00)	75.6	81.1
(2025/11/20 16:33:02.00)	75.1	80.9



(2025/11/20 16:36:03.00)	75	81.9
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(2025/11/20 17:09:02.00)	74.6	81.2
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(2025/11/20 17:24:02.00)	74.7	83
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(2025/11/20 17:33:02.00)	75.7	80.9
(2025/11/20 17:36:02.00)	75.6	83.3
(2025/11/20 17:39:02.00)	75.2	81.3
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(2025/11/20 20:54:02.00)	71.2	82.4
(2025/11/20 20:57:02.00)	70.9	81.2



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(2025/11/20 21:12:02.00)	72.1	84.6
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(2025/11/20 21:30:02.00)	72.4	81.3
(2025/11/20 21:33:02.00)	72.1	80.3
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(2025/11/20 21:39:02.00)	68.9	79.4
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(2025/11/20 22:09:02.00)	71.7	82.5
(2025/11/20 22:12:02.00)	71.5	83.6
(2025/11/20 22:15:02.00)	71.4	80.6
(2025/11/20 22:18:02.00)	70.1	80.3
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(2025/11/21 03:33:02.00)	59	76



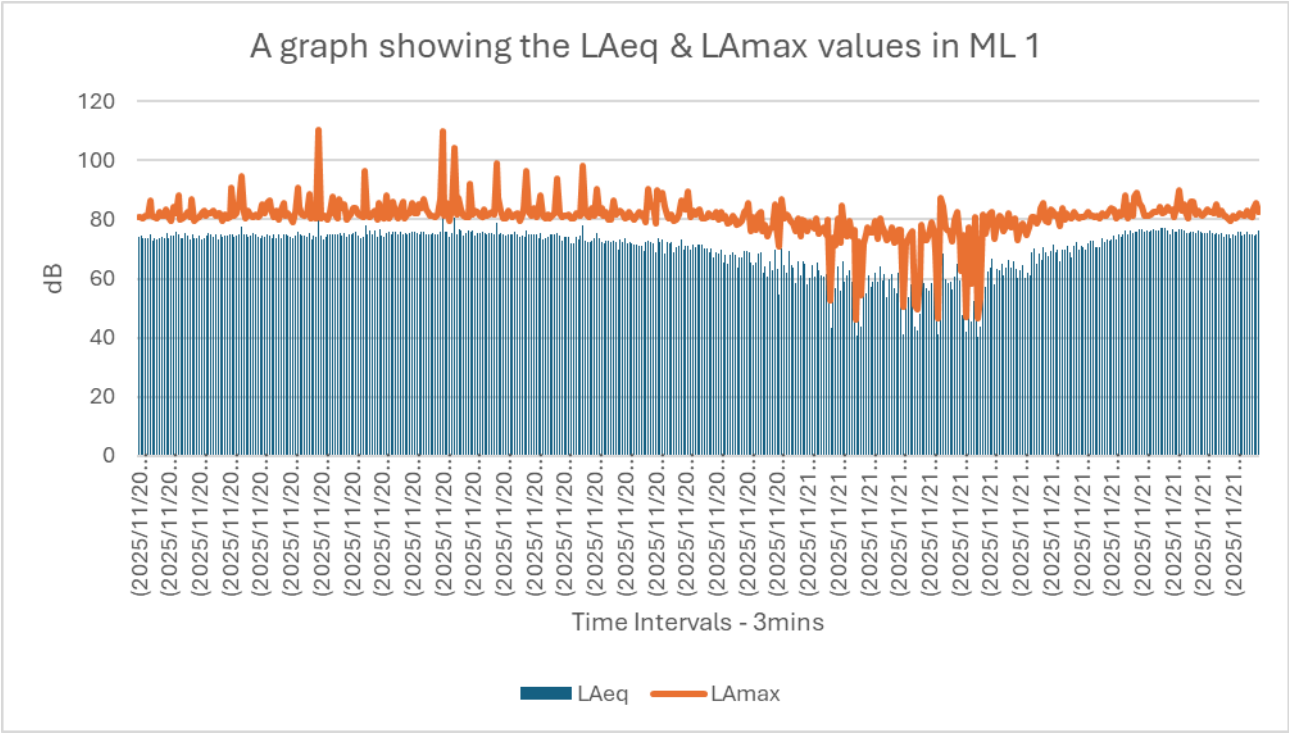
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(2025/11/21 04:54:02.00)	65.7	79.5
(2025/11/21 04:57:02.00)	63.1	80.5
(2025/11/21 05:00:02.00)	60.2	73.1
(2025/11/21 05:03:02.00)	62.9	77.4
(2025/11/21 05:06:02.00)	64.5	78.8
(2025/11/21 05:09:02.00)	60.1	76.1
(2025/11/21 05:12:02.00)	62.1	74.6
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(2025/11/21 05:33:02.00)	70.7	85.5
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(2025/11/21 06:33:02.00)	73	81.4
(2025/11/21 06:36:02.00)	72.8	81.4
(2025/11/21 06:39:02.00)	70.6	81
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(2025/11/21 06:45:02.00)	70.7	80.5
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(2025/11/21 07:36:02.00)	76.7	85.7
(2025/11/21 07:39:02.00)	76.6	84.5
(2025/11/21 07:42:02.00)	75.8	81.1
(2025/11/21 07:45:02.00)	76.2	81.5
(2025/11/21 07:48:02.00)	76	81.1
(2025/11/21 07:51:02.00)	76.2	81.6
(2025/11/21 07:54:02.00)	76.7	82.5
(2025/11/21 07:57:02.00)	76.1	82.4



(2025/11/21 08:00:02.00)	76.3	83
(2025/11/21 08:03:02.00)	77.2	84.5
(2025/11/21 08:06:02.00)	77.2	82.2
(2025/11/21 08:09:02.00)	77	82.8
(2025/11/21 08:12:02.00)	76.1	84.2
(2025/11/21 08:15:02.00)	75.1	83.2
(2025/11/21 08:18:02.00)	76.9	83.3
(2025/11/21 08:21:03.00)	75.7	81
(2025/11/21 08:24:02.00)	75.8	84.3
(2025/11/21 08:27:02.00)	76.9	89.8
(2025/11/21 08:30:02.00)	76.6	83.2
(2025/11/21 08:33:02.00)	76.3	85.1
(2025/11/21 08:36:02.00)	75.3	82.7
(2025/11/21 08:39:02.00)	75.4	80.5
(2025/11/21 08:42:02.00)	75.7	86.1
(2025/11/21 08:45:02.00)	75.9	86
(2025/11/21 08:48:02.00)	75.6	81.8
(2025/11/21 08:51:02.00)	76.1	82.9
(2025/11/21 08:54:03.00)	75.8	82.3
(2025/11/21 08:57:02.00)	75.3	81.4
(2025/11/21 09:00:02.00)	75.6	82.2
(2025/11/21 09:03:02.00)	75.6	83.3
(2025/11/21 09:06:02.00)	76.1	82.4
(2025/11/21 09:09:03.00)	75.5	82.6
(2025/11/21 09:12:02.00)	75.2	82.2
(2025/11/21 09:15:02.00)	75.5	85.4
(2025/11/21 09:18:02.00)	75.1	81.7
(2025/11/21 09:21:02.00)	75.3	83.2
(2025/11/21 09:24:03.00)	74.3	81.4
(2025/11/21 09:27:02.00)	75.2	81.2
(2025/11/21 09:30:02.00)	74.9	80.4
(2025/11/21 09:33:03.00)	73.5	79.4
(2025/11/21 09:36:02.00)	74.9	81.2
(2025/11/21 09:39:03.00)	74.4	80.6
(2025/11/21 09:42:02.00)	76	81.5
(2025/11/21 09:45:02.00)	75.8	82.2
(2025/11/21 09:48:02.00)	74.4	81.6
(2025/11/21 09:51:02.00)	74.9	81.1
(2025/11/21 09:54:02.00)	75.7	83
(2025/11/21 09:57:02.00)	75	81.4
(2025/11/21 10:00:02.00)	75.1	81
(2025/11/21 10:03:02.00)	74.6	83.9
(2025/11/21 10:06:02.00)	75.1	85.5
(2025/11/21 10:09:02.00)	76.1	82.6





ML 2 – LAmax included, but the 15min values not used as per description in the reports

Time Period	LAeq	LAmax
(2026/02/10 07:00:02.00)	60.6	93.2
(2026/02/10 07:15:02.00)	57.1	70.5
(2026/02/10 07:30:02.00)	58	68.8
(2026/02/10 07:45:02.00)	57.6	67.4
(2026/02/10 08:00:02.00)	56.9	64.5
(2026/02/10 08:15:02.00)	58	71.1
(2026/02/10 08:30:02.00)	58.1	70.8
(2026/02/10 08:45:02.00)	57.4	66.2
(2026/02/10 09:00:02.00)	57.4	77.9
(2026/02/10 09:15:02.00)	57.2	70.6
(2026/02/10 09:30:02.00)	56.4	67.5
(2026/02/10 09:45:02.00)	56.2	65.9
(2026/02/10 10:00:02.00)	56.1	65.4
(2026/02/10 10:15:02.00)	55.7	65.8
(2026/02/10 10:30:02.00)	56.8	72.7
(2026/02/10 10:45:02.00)	56.5	71.3
(2026/02/10 11:00:02.00)	58.6	81.1
(2026/02/10 11:15:02.00)	56.8	73.4
(2026/02/10 11:30:02.00)	55.4	66.3
(2026/02/10 11:45:02.00)	55.7	67.6
(2026/02/10 12:00:02.00)	55.6	69.3
(2026/02/10 12:15:02.00)	56.4	66.3
(2026/02/10 12:30:02.00)	57.1	69.4
(2026/02/10 12:45:02.00)	57.3	68.3
(2026/02/10 13:00:02.00)	56.4	63.9
(2026/02/10 13:15:02.00)	55.7	64.2
(2026/02/10 13:30:02.00)	56.3	65.3
(2026/02/10 13:45:02.00)	56	65.9
(2026/02/10 14:00:02.00)	56.7	65.8
(2026/02/10 14:15:02.00)	57.3	72.5
(2026/02/10 14:30:02.00)	57.9	79.6
(2026/02/10 14:45:02.00)	58.5	87.6
(2026/02/10 15:00:02.00)	57.1	69.4
(2026/02/10 15:15:02.00)	58.2	76.7
(2026/02/10 15:30:02.00)	59.2	72.9
(2026/02/10 15:45:02.00)	58.4	66.7
(2026/02/10 16:00:02.00)	59.4	76.2
(2026/02/10 16:15:02.00)	57.5	67.7



(2026/02/10 16:30:02.00)	57.1	65.8
(2026/02/10 16:45:02.00)	56.6	67
(2026/02/10 17:00:02.00)	57.3	70.1
(2026/02/10 17:15:02.00)	57.3	71.4
(2026/02/10 17:30:02.00)	56.7	65.6
(2026/02/10 17:45:02.00)	56.3	66.7
(2026/02/10 18:00:02.00)	57.2	74
(2026/02/10 18:15:02.00)	56.9	67.1
(2026/02/10 18:30:02.00)	56	66.4
(2026/02/10 18:45:03.00)	56.5	79.7
(2026/02/10 19:00:02.00)	56.6	69.6
(2026/02/10 19:15:02.00)	55.2	64.3
(2026/02/10 19:30:02.00)	55.1	64.2
(2026/02/10 19:45:02.00)	54.4	60.9
(2026/02/10 20:00:02.00)	54.5	69.4
(2026/02/10 20:15:02.00)	55.5	74.1
(2026/02/10 20:30:02.00)	53.1	62.6
(2026/02/10 20:45:02.00)	52.1	63.7
(2026/02/10 21:00:02.00)	52.4	61.1
(2026/02/10 21:15:02.00)	52.2	67.9
(2026/02/10 21:30:02.00)	55.6	75
(2026/02/10 21:45:02.00)	51.2	67.5
(2026/02/10 22:00:02.00)	52.9	68.2
(2026/02/10 22:15:02.00)	51.8	61.2
(2026/02/10 22:30:02.00)	50.1	63.7
(2026/02/10 22:45:02.00)	51.8	72.5
(2026/02/10 23:00:02.00)	50.2	64.8
(2026/02/10 23:15:02.00)	48.4	62.6
(2026/02/10 23:30:02.00)	48.6	61.9
(2026/02/10 23:45:02.00)	50.7	73
(2026/02/11 00:00:02.00)	46.3	63.5
(2026/02/11 00:15:02.00)	46.7	59.1
(2026/02/11 00:30:02.00)	43.6	60.3
(2026/02/11 00:45:02.00)	46	62
(2026/02/11 01:00:02.00)	46.2	62.8
(2026/02/11 01:15:02.00)	45.5	61.2
(2026/02/11 01:30:02.00)	45	60.7
(2026/02/11 01:45:02.00)	43.5	60.9
(2026/02/11 02:00:02.00)	42.3	53.9
(2026/02/11 02:15:02.00)	45.5	60.3
(2026/02/11 02:30:02.00)	44.1	63.1
(2026/02/11 02:45:02.00)	44.1	58.7
(2026/02/11 03:00:02.00)	43.8	58.5
(2026/02/11 03:15:02.00)	42.9	58



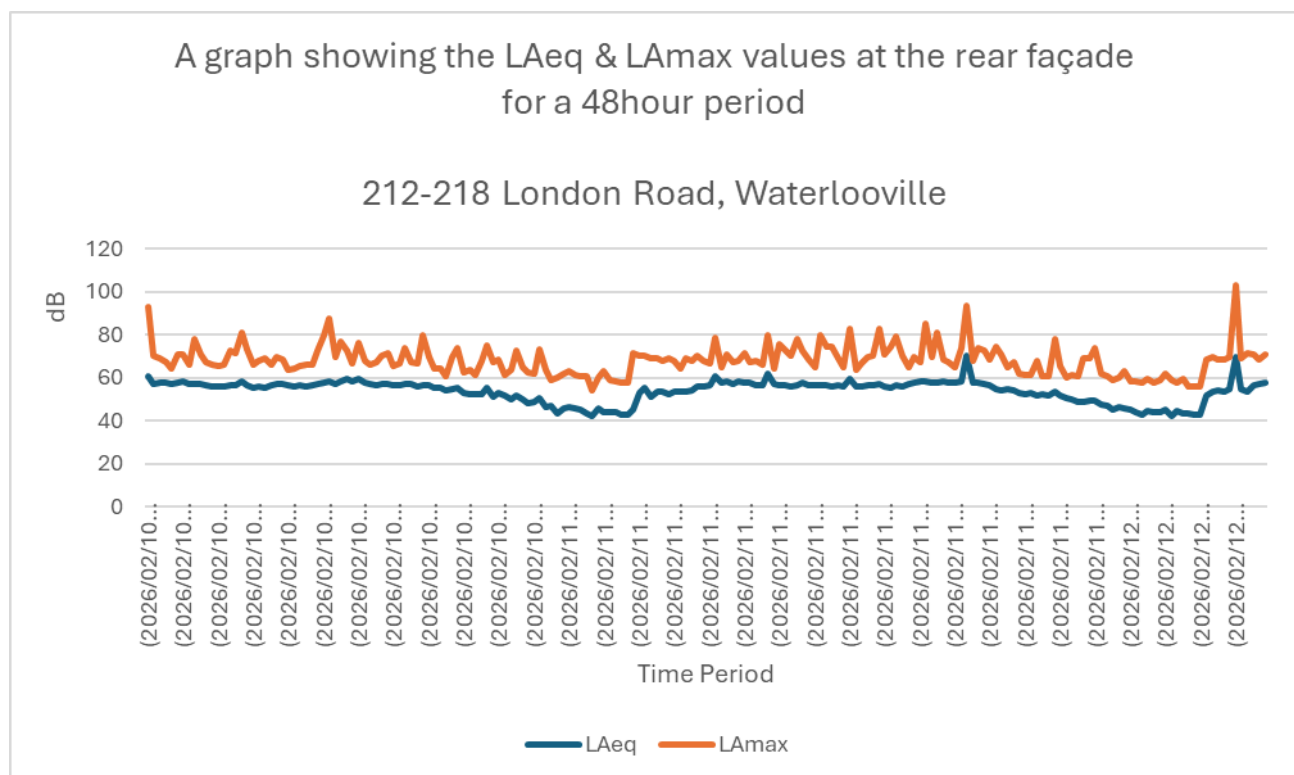
(2026/02/11 03:30:02.00)	42.9	58
(2026/02/11 03:45:02.00)	45.4	71.5
(2026/02/11 04:00:02.00)	52.8	70.4
(2026/02/11 04:15:02.00)	55.2	70.4
(2026/02/11 04:30:02.00)	51.2	68.8
(2026/02/11 04:45:02.00)	53.5	68.9
(2026/02/11 05:00:02.00)	53.5	68
(2026/02/11 05:15:02.00)	52.6	69
(2026/02/11 05:30:02.00)	53.5	67.6
(2026/02/11 05:45:02.00)	53.5	64.3
(2026/02/11 06:00:02.00)	53.6	69
(2026/02/11 06:15:02.00)	54.2	67.8
(2026/02/11 06:30:02.00)	55.8	70.5
(2026/02/11 06:45:02.00)	56	67.8
(2026/02/11 07:00:02.00)	56.3	66.7
(2026/02/11 07:15:02.00)	60.5	78.7
(2026/02/11 07:30:02.00)	57.9	65
(2026/02/11 07:45:02.00)	58.1	71
(2026/02/11 08:00:02.00)	57.1	67.1
(2026/02/11 08:15:02.00)	58.1	67.8
(2026/02/11 08:30:02.00)	57.5	71.7
(2026/02/11 08:45:02.00)	57.5	67.2
(2026/02/11 09:00:02.00)	56.6	67.8
(2026/02/11 09:15:02.00)	56.3	65.9
(2026/02/11 09:30:02.00)	61.6	79.5
(2026/02/11 09:45:02.00)	57.1	64.3
(2026/02/11 10:00:02.00)	56.6	75.8
(2026/02/11 10:15:02.00)	56.4	72.9
(2026/02/11 10:30:02.00)	55.8	70.4
(2026/02/11 10:45:02.00)	56.8	78.1
(2026/02/11 11:00:02.00)	57.5	72.4
(2026/02/11 11:15:02.00)	56.7	68.7
(2026/02/11 11:30:02.00)	56.5	64.8
(2026/02/11 11:45:02.00)	56.4	79.5
(2026/02/11 12:00:02.00)	56.4	74.2
(2026/02/11 12:15:02.00)	56	74.5
(2026/02/11 12:30:02.00)	56.6	68.9
(2026/02/11 12:45:02.00)	56	64.6
(2026/02/11 13:00:02.00)	59.5	83
(2026/02/11 13:15:03.00)	55.9	63.8
(2026/02/11 13:30:02.00)	55.7	66.5
(2026/02/11 13:45:02.00)	56.8	69.4
(2026/02/11 14:00:02.00)	56.7	70.2
(2026/02/11 14:15:02.00)	56.9	82.6



(2026/02/11 14:30:02.00)	56.2	71.1
(2026/02/11 14:45:02.00)	55.5	74.3
(2026/02/11 15:00:02.00)	56.6	79.3
(2026/02/11 15:15:02.00)	55.9	70
(2026/02/11 15:30:02.00)	57.4	65.1
(2026/02/11 15:45:02.00)	57.7	69.9
(2026/02/11 16:00:02.00)	58.2	67.5
(2026/02/11 16:15:02.00)	58.4	85
(2026/02/11 16:30:02.00)	57.6	69.9
(2026/02/11 16:45:02.00)	57.8	80.7
(2026/02/11 17:00:02.00)	58.1	68.5
(2026/02/11 17:15:02.00)	57.6	67.5
(2026/02/11 17:30:02.00)	57.9	65
(2026/02/11 17:45:02.00)	58.1	73.8
(2026/02/11 18:00:02.00)	70.1	93.6
(2026/02/11 18:15:02.00)	57.6	67.8
(2026/02/11 18:30:02.00)	57.6	73.9
(2026/02/11 18:45:02.00)	56.9	72.5
(2026/02/11 19:00:02.00)	56.3	68.3
(2026/02/11 19:15:02.00)	55	74.6
(2026/02/11 19:30:02.00)	54.2	71
(2026/02/11 19:45:02.00)	54.5	65
(2026/02/11 20:00:02.00)	54	67.2
(2026/02/11 20:15:02.00)	53	61.6
(2026/02/11 20:30:02.00)	52.5	61.4
(2026/02/11 20:45:02.00)	53	61.5
(2026/02/11 21:00:02.00)	52	67.7
(2026/02/11 21:15:02.00)	52.2	60.9
(2026/02/11 21:30:02.00)	51.5	60.8
(2026/02/11 21:45:02.00)	53.5	77.7
(2026/02/11 22:00:02.00)	51.6	65.2
(2026/02/11 22:15:02.00)	50.6	59.9
(2026/02/11 22:30:02.00)	50.1	61.1
(2026/02/11 22:45:02.00)	49	60.7
(2026/02/11 23:00:02.00)	48.8	69.3
(2026/02/11 23:15:02.00)	49.4	69.1
(2026/02/11 23:30:02.00)	49.4	74.1
(2026/02/11 23:45:02.00)	47.4	61.7
(2026/02/12 00:00:03.00)	46.8	60.8
(2026/02/12 00:15:02.00)	45.3	58.7
(2026/02/12 00:30:02.00)	46.2	60.2
(2026/02/12 00:45:02.00)	45.5	63.2
(2026/02/12 01:00:02.00)	45.1	58.3
(2026/02/12 01:15:02.00)	43.7	58.5



(2026/02/12 01:30:02.00)	43	57.5
(2026/02/12 01:45:02.00)	44.8	59.5
(2026/02/12 02:00:02.00)	44.1	58
(2026/02/12 02:15:02.00)	44	58.9
(2026/02/12 02:30:02.00)	44.9	62.1
(2026/02/12 02:45:02.00)	42.3	58.9
(2026/02/12 03:00:02.00)	44.6	57.9
(2026/02/12 03:15:02.00)	43.1	59.3
(2026/02/12 03:30:02.00)	43.3	56.1
(2026/02/12 03:45:02.00)	42.9	56.2
(2026/02/12 04:00:02.00)	42.9	55.7
(2026/02/12 04:15:02.00)	51.7	68.4
(2026/02/12 04:30:02.00)	53.4	69.9
(2026/02/12 04:45:02.00)	54.2	68.2
(2026/02/12 05:00:02.00)	53.6	68.7
(2026/02/12 05:15:02.00)	54.6	69.7
(2026/02/12 05:30:02.00)	69.4	103.2
(2026/02/12 05:45:02.00)	54.5	69.2
(2026/02/12 06:00:02.00)	53.7	71.6
(2026/02/12 06:15:02.00)	56.6	70.6
(2026/02/12 06:30:02.00)	57.2	68.2
(2026/02/12 06:45:02.00)	57.8	70.8





Sunday Night	LAeq	LAmx
(2026/02/15 23:00:02.00)	51.8	67.7
(2026/02/15 23:15:02.00)	47.2	61.1
(2026/02/15 23:30:02.00)	46.6	60.2
(2026/02/15 23:45:02.00)	46.3	60.1
(2026/02/16 00:00:03.00)	48.2	67.3
(2026/02/16 00:15:02.00)	45.7	58.8
(2026/02/16 00:30:02.00)	50	72.4
(2026/02/16 00:45:02.00)	45.9	61.2
(2026/02/16 01:00:02.00)	45.1	58.2
(2026/02/16 01:15:02.00)	44.7	59.9
(2026/02/16 01:30:02.00)	45.1	62.5
(2026/02/16 01:45:02.00)	43.1	58.4
(2026/02/16 02:00:02.00)	42.2	56.9
(2026/02/16 02:15:02.00)	43.5	61.9
(2026/02/16 02:30:02.00)	44.6	56.8
(2026/02/16 02:45:02.00)	44.5	61.7
(2026/02/16 03:00:02.00)	44.7	60.9
(2026/02/16 03:15:02.00)	43.7	58.2
(2026/02/16 03:30:02.00)	42.3	57.3
(2026/02/16 03:45:02.00)	46.4	58.4
(2026/02/16 04:00:02.00)	47.6	59.3
(2026/02/16 04:15:02.00)	45.4	58.8
(2026/02/16 04:30:02.00)	46.4	59
(2026/02/16 04:45:02.00)	49	68.2
(2026/02/16 05:00:02.00)	48.3	66.4
(2026/02/16 05:15:02.00)	55.1	69.9
(2026/02/16 05:30:02.00)	54.1	68.8
(2026/02/16 05:45:02.00)	55.6	68.5
(2026/02/16 06:00:02.00)	55.9	67.8
(2026/02/16 06:15:02.00)	55.2	69.6
(2026/02/16 06:30:02.00)	55.9	71.7
(2026/02/16 06:45:02.00)	56.2	70.6

